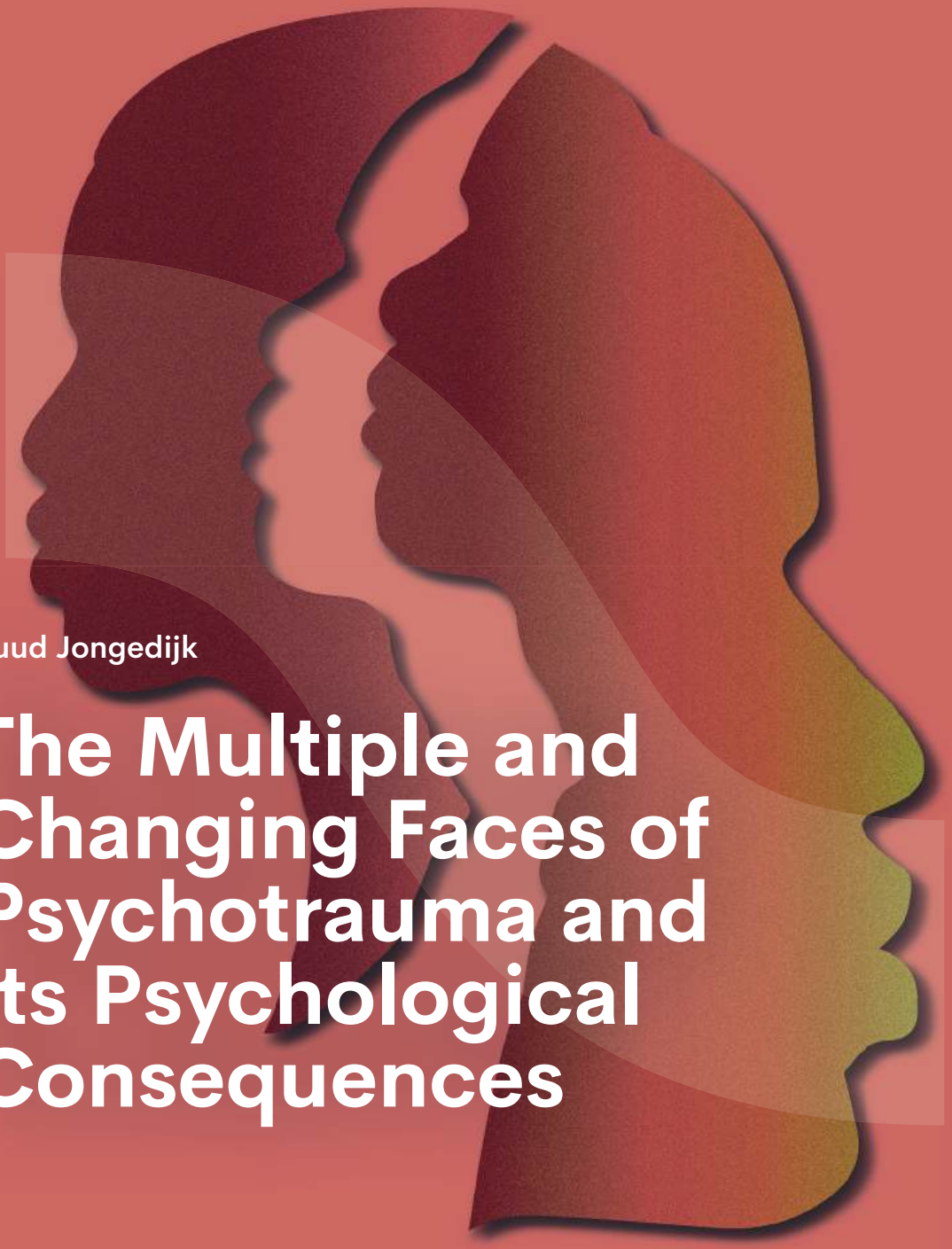


Ruud Jongedijk

The Multiple and Changing Faces of Psychotrauma and its Psychological Consequences

ARQ
Nationaal
Psychotrauma
Centrum

The Multiple and Changing Faces of Psychotrauma and its Psychological Consequences

Rudolf (Ruud) Albert Jongedijk

ARQ
Nationaal
Psychotrauma
Centrum

Dit boek is een uitgave van ARQ Nationaal Psychotrauma Centrum en maakt deel uit van de ARQ boekenreeks.

Cover: hollandse meesters, Utrecht
Cover image and illustrations: Taschelna Bodo / Creative Studio Tas
Lay-out: Ilse Modder | www.ilsemodder.nl
Printing / binding: Gildeprint, Enschede | www.gildeprint.nl

ISBN: 978-94-6496-165-2
DOI: https://doi.org/10.33540/2537

The Multiple and Changing Faces of Psychotrauma and its Psychological Consequences

De veelvoudige en veranderende gezichten van psychotrauma en de psychologische gevolgen

(met een samenvatting in het Nederlands)

Proefschrift

ter verkrijging van de graad van doctor aan de
Universiteit Utrecht
op gezag van de
rector magnificus, prof. dr. H.R.B.M. Kummeling,
ingevolge het besluit van het College voor Promoties
in het openbaar te verdedigen op

vrijdag 17 januari 2025 des middags te 2.15 uur

door

Rudolf Albert Jongedijk

geboren op 23 augustus 1957
te Bergen NH

Promotor:
Prof. dr. P.A. Boelen

Copromotor:
Dr. J.W. Knipscheer

Beoordelingscommissie:
Prof. dr. M.H.J. Bekker
Prof. dr. G. Blok
Prof. dr. M.H. Braakman
Prof. dr. S.G. Geuze
Prof. dr. M.J. Jongmans

Dit proefschrift werd mede mogelijk gemaakt met financiële steun van ARQ Nationaal Psychotrauma Centrum

'I am sure it would be sensible to restrict as much as possible the work of these gentlemen, who are capable of doing an immense amount of harm with what may very easily degenerate into charlatanry. (…..) it is very wrong to disturb large numbers of healthy, normal men and women by asking the kind of odd questions in which the psychiatrists specialize.' [1]

1 Winston Churchill (December 1942). Citation from a letter to the Lord President of the Council, about psychiatrists in times of war. Retrieved from: http://www.worldwar2facts.org/winston-churchill-quotes.html

PREFACE

When ARQ Centrum'45 was founded in 1973, people often spoke of the post-concentration camp syndrome or KZ syndrome. Post-traumatic stress disorder, PTSD for short, did not yet exist. But developments have happened very quickly and the terms 'psychotrauma' and 'PTSD' have now become very common and even popular in everyday speech. As if they have always existed and would be fixed and universally defined concepts. This dissertation concerns a search into the nature of these concepts: how did they arise and how clear and valid are their definitions?

Ruud Jongedijk has been working at ARQ National Psychotrauma Centre for over twenty years as a psychiatrist/psychotherapist at ARQ Centrum'45 and a Narrative Exposure Therapy (NET) trainer and supervisor at ARQ Academy. Until 2021, he also was the clinical and medical director of ARQ Centrum'45. As a clinician, he became intrigued early on by the diversity of manifestations of post-traumatic symptoms in patients. He regularly asked himself questions about this and this ultimately resulted in this thesis, which stems from issues that arose in clinical practice.

The subject of this thesis evolves around the basic principles of ARQ National Psychotrauma Centre, namely: psychotrauma and its consequences. Under the title *The Multiple and Changing Faces of Psychotrauma and its Psychological Consequences*, this dissertation describes the various manifestations of post-traumatic symptoms and syndromes in a historical review. Data, mainly collected from patients of ARQ Centrum'45, were then used to investigate which different symptoms these traumatized patients report and which symptom profiles can be distinguished. Finally, the significance of the different PTSD clusters with regard to treatment results was examined.

The common thread through all chapters of this study is that the psychopathology that arises after experiencing psychotraumatic experiences is very diverse and heterogeneous and cannot easily be captured by a single diagnosis. Even the described concepts of 'psychotrauma' and 'PTSD' are not set in stone and their definitions have varied considerably over the decades and to this day there is debate about which symptoms do or do not belong to the PTSD category. This dissertation shows that the symptomatology of traumatized patients is indeed often heterogeneous. Jongedijk and co-authors argue that this does not necessarily mean that all these symptoms should fall within one diagnostic category and propose a diagnostic approach in which categorical and dimensional elements are represented. This makes the individual symptom profiles of traumatized patients more visible and, above all, more personalized and can be of great value to our patients, for example when it comes to more tailored treatment approaches.

We are pleased to offer you this dissertation because it contributes to the knowledge needed to better understand patients who have experienced psychotraumatic events and who struggle with their often long-lasting consequences.

Melina Kappeyne van de Copello-Rakic
Chair of the Board of Directors

TABLE OF CONTENTS

‘*Every diagnostic classification has a history, but PTSD is historical in an additional sense*.’ [2]

2 Allan Young (2016). Culture, history and traumatic memory: an interpretation. *Acta Bioethica, 22*, 1, p. 6

General introduction

1

1

1.1 INTRODUCTION

Bram is a Dutch 25-year-old firefighter, who came for treatment because he suffered from nightmares in which he kept seeing a charred child's corpse. He also saw the screaming and crying mother who looked at him desperately when he carried the child out of the house in his arms. He experienced this situation six months ago. And for several months now he has been waking up screaming almost every night. During the day, he is exhausted and irritable with his family members. He isolates himself from his colleagues and friends. In his career as a firefighter, he has never experienced such a drastic event and his life history also shows no shocking experiences.

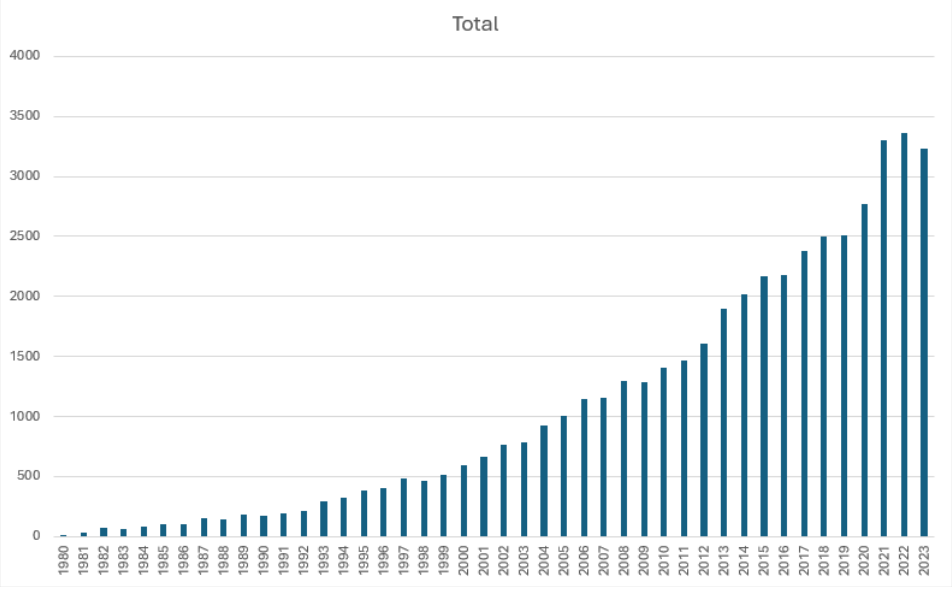
Amir is a 55-year-old Syrian man, who was a high school chemistry teacher and led a comfortable and happy life with his family. He has experienced several bombings and was arrested by the secret police because he belonged to an opposition group. He was brutally tortured in prison for two months. He was then dumped in a landfill. He lost contact with his wife and his son and he never saw them again. Through a friend he managed to flee across the border and after wandering for two years, he arrived in the Netherlands. At first, he had many intrusions but they disappeared and he enjoyed working in a flower shop for years. After he was robbed on the street, he developed serious complaints. He sought treatment because his left arm was partially numb while the neurologist could find no physical cause. He had cramps in his muscles and a headache with dizziness. He was gloomy, thought life was worthless and thought a lot about death. He repeatedly saw his terrible prison experiences in his dreams. For days he sat alone in his room and just stared into space, thinking about his wife and son.

Mary is a 28-year-old Dutch woman who, at the request of a women's shelter, applied for treatment. She recently ended her third relationship in which her partner physically and sexually abused her. She couldn't stand it anymore and fled in panic to the shelter. Over the years she has had many serious complaints, such as temper tantrums, argued a lot with people, used multiple drugs, made a number of suicide attempts, and cut herself repeatedly in the arm. She regularly found herself in places where she didn't know how she got there. She never worked. In the shelter, many images emerged with vivid and haunting flashbacks and nightmares about the beatings and abuse in her relationship, but especially about her childhood, in which she was sexually abused.

All three patients described above have experienced serious and significantly disruptive events and suffer from serious psychological symptoms. It is likely that all three can be diagnosed with the disorder 'Post-traumatic Stress Disorder' (PTSD). But still, the three patients are very different, not only in terms of symptoms, but also in the expression of their complaints and, of course, in the context in which the shocking events took place. This provides food for reflection.

In the years shortly after the introduction of PTSD in the Diagnostic and Statistical Manual of Mental Disorders, third edition (DSM-III; APA, 1980), there was great optimism about the concept. This trend continued and in general, PTSD was firmly embraced as an important new disorder that did justice to the mental problems of traumatized patients and gave them the necessary recognition for the terrible experiences that had happened to them (Gersons & Carlier, 1992). PTSD has become an integral part of mental health care. The psychotrauma research field flourished. The number of publications with the keyword PTSD or Post Traumatic Stress Disorder has increased enormously since 1980 and has continued to increase in recent years (see Figure 1.1). In addition, many national and international societies for traumatic stress studies were founded and several scientific journals specialised in psychotrauma were established. In the general public and in the media, PTSD gained enormous popularity (Lerner & Micale, 2018). Allan Young stated in this regard: '*Today the language of trauma permeates everyday discourse, television, and radio talk, print journalism, popular fiction, etc. The language of posttraumatic stress is the Esperanto of global suffering (…..).*' (Young, 2007, p. 1031).

Figure 1.1. Total number of scientific publications (search in Ovid Medline ALL for the search terms "PTSD" and "Posttraumatic Stress Disorder", period 1980-2023).[3]



3 Thanks to Library ARQ National Psychotrauma Centre, Mrs. Jonna Lind

However, the concept of PTSD is also being questioned and criticized. The question marks regarding PTSD concern the manifestations of the disorder, the heterogeneity in symptom expression, its relationship to the eliciting event, its sociocultural dimension, and sometimes even its raison d'être. Criticisms often came from sociological, anthropological and historical perspectives.

In this dissertation we examine the manifestations of trauma-related events and the psychological symptoms and disorders associated with these events. In several studies, we explore the variety of symptoms and syndromes that can follow potentially traumatic events (PTEs) to shed light on how PTEs are defined, and how the psychological consequences of PTEs are conceptualized. This first chapter provides a general introduction to the topics central in this dissertation.

1.2 MULTIPLE FACES

We have always experienced surprise and marvel at the ways traumatized patients express and present themselves. These expressions were of great heterogeneity, although most patients could be classified as having PTSD. Some patients were quiet and withdrawn, some were outgoing and even externalizing. Some were depressed and avoidant, others had many daily intrusions and were hyperactive, or suffered from interpersonal problems, tantrums, sleeping problems, or somatic complaints. Some functioned reasonably well, while others suffered from severe social decline. In short, in clinical practice we were confronted with the heterogeneity or *the multiple faces* of psychological symptomatology after PTEs. This heterogeneity was also noted in the scientific literature. For example, in the early 1990s, a new concept, which was just being developed at the time, offered an interesting perspective. It was called 'Disorders of Extreme Stress Not Otherwise Specified', 'DESNOS', or 'complex PTSD' (Herman, 1992). DESNOS allowed explicit mention of the heterogeneity of symptoms occurring in severely traumatized patients. Together with Carlier and Gersons we realized the Dutch translation of the structured interview for DESNOS (Carlier et al., 1992) and subsequently conducted an early study into DESNOS among Dutch military veterans at ARQ Centrum'45 (Jongedijk et al., 1995, 1996).

From the onset, DESNOS unfortunately proved not to be the ideal solution for solving the problem of heterogeneity because the concept itself was too heterogeneous. It is generally assumed that diagnoses, as formulated in categorical diagnostic systems such as the DSM, are recognizable entities. DESNOS was too much of a tangle of symptoms without clear coherence, there was too little demarcation with (borderline) personality disorders and too little research was done to substantiate the disorder (e.g., Luxenberg et al., 2001).

Continuing the diagnostic search, the advantages and disadvantages of the categorical DSM diagnostic system were examined in a review article (Jongedijk, 2001). That review described the positive features of the DSM system, such as the reliability, uniformity and recognizability of the defined disorders, which allows clearer and less ambiguous

communication between clinicians or researchers. However, the disadvantages that the categorical DSM classification could have on the diagnostic process, should not be ignored. Major disadvantages included a lack of validity of the disorders, the tendency to rely on selective, top-down diagnostics, alleged strict boundaries between categories that often did not correspond to reality, for example because of the many comorbidities, and too much attention to psychological complaints, partly resulting in a lack of attention to personalized, context-related information (see Table 1.1). The disadvantages, but certainly also the incorrect use of categorical diagnostic systems, have been described in various publications (e.g., Aftab & Ryznar, 2020; Broman-Folks et al., 2006).

An important message from our article (Jongedijk, 2001) was: use clinical judgment by carefully examining all *symptoms* ('bottom-up diagnostics') to make a correct diagnosis, without jumping to conclusions (i.e., diagnostic categories). In addition, it is important to use clinical judgment to distinguish psychopathology from normal psychological reactions, such as symptoms during a period of great psychosocial stress (e.g., Kleber, 2013).

Table 1.1. Some advantages and disadvantages of the categorical diagnostical systems (adapted from: Jongedijk, 2001).

Advantages	Disadvantages
- Uniformity	- Lack of important personal and contextual information
- Clear communication	- Danger of improper use by e.g., non-clinicians ('simplification')
- Reliability	- All or nothing principle: e.g., one criterium lacking is not fulfilling the disorder
- Recognizability and connection with clinical decision making	- Selective diagnostics ('top-down diagnostics')
- Connection to targeted treatments	- Suggesting strict boundaries between categories
- Theoretical neutrality	- High rates of comorbidity
- Multi-axis system	- Subjectivity for the clinical significance criterium
	- False positive diagnoses e.g., normal reactions due to stressful circumstances
	- Theoretical neutrality
	- No one-to-one relationship with treatment

We subsequently argued that the various disadvantages of the categorical system could be overcome by using or adding alternative diagnostic models, such as a dimensional diagnostic approach (Jongedijk, 2008).

A dimensional approach will do more justice to patients' complaints because their complaints cannot always be clearly placed in strictly defined categories. This may be even more true for traumatized patients, where the consequences of serious adverse events will not always lead to the same symptom complex. For these patients, it may be essential to define symptoms, symptom groups, or other characteristics that are specifically important for the individual. This allows diagnostics to be refined and personalized, allowing more specific tailored treatment interventions to be developed and applied.

Some of the dimensional approaches were introduced with the possibility of adding dimensional aspects to complement the existing categorical approach, the so-called *hybrid* system (Regier et al., 2009). Examples were the proposals to add a severity dimension to PTSD (Broman-Folks et al., 2006) or to add subtypes to PTSD (Dalenberg et al., 2012). Examples of subtypes are internalizing and externalizing subtypes or dimensions, where internalizing mainly stands for symptoms of anxiety and depression and externalizing, for example, for aggression and substance abuse (Miller & Resick, 2007). However, instead of adding dimensional aspects as a complement to categorical concepts, several dimensional approaches were introduced as new diagnostic models. Examples are the 'Research Domain Criteria' (RDoC) (Insel et al., 2010), the 'Hierarchical Taxonomy of Psychopathology' (HiTOP) (Kotov et al., 2017), or the symptom-oriented 'Network Approach' (Borsboom et al., 2011). Despite all these developments, dimensional models have not yet officially become part of accepted diagnostic systems such as DSM or ICD (Zachar & Kendler, 2017). However, serious attempts have been made to integrate dimensional approaches into the categorical system, especially when it comes to personality disorders, both in DSM-5 (DSM-5's 'Alternative Model for Personality Disorders' or 'AMPD') (Zimmermann et al., 2019) and in ICD-11 (Reed, 2018).

1.3 CHANGING FACES

There has been a great diversity in descriptions of posttraumatic disorders and syndromes over the years. Well-known disorders from the history of psychotrauma include 'Shell Shock', 'Soldiers Heart', 'Survivor Syndrome', and somewhat more recently the aforementioned 'DESNOS'. Even within the DSM diagnostic system itself, the definition of PTSD has continued to change since 1980. All these changes over the years can be subsumed under the title *the changing faces* of post-traumatic psychopathology.

PTSD is a relatively new diagnosis, introduced in 1980 (APA, 1980). The three formulated symptom clusters of PTSD, named 're-experiencing', 'avoidance', and 'arousal and reactivity', have changed only slightly during successive editions of the DSM. However, the transition to the DSM-5 (APA, 2013) meant a rather drastic change, as a fourth symptom cluster was added called 'negative changes in cognitions and mood'. This extension marked a break with the ICD classification, where in the latest version, the ICD-11 (International Classification of Diseases, the diagnostic manual of the World Health Organization WHO), PTSD is defined in three symptom clusters ('intrusions and re-experiencing', 'avoidance', and 'arousal and reactivity or sense of current threat'). Interestingly, ICD-11 added a new disorder called 'complex PTSD', which allowed for additional symptoms not included in the original PTSD (WHO, 2018). Thus, both diagnostic systems attempted to address the heterogeneity of trauma symptomatology in their own way. This has ultimately resulted in the fact that clinicians, researchers, and also patients today are confronted with (two) clearly different forms of PTSD: one according to the DSM-5 and one according to the ICD-11.

1.4 THE TRAUMATIC EVENT CRITERION

In addition to the definition of PTSD symptomatology, there are also differences and changes in the definition of the trauma criterion. PTSD is a unique diagnosis because an etiological element was included in the diagnostic criteria themselves: the (potentially) traumatic event (PTE) or 'Criterion A'[4] (APA, 1980). This has not been common since the introduction of the DSM-III, which in principle always defined the diagnostic categories as etiologically neutral, because in psychopathology the causes were generally considered unknown or, more likely, ambiguous. Only in disorders for which the cause was clear, such as for the various organic disorders and substance use disorders, the cause was stated.

Several authors have argued that exposure to a traumatic event is the foundation for the rest of the criteria of PTSD. For instance, Breslau and colleagues (2002) emphasized that the link between PTSD symptoms and exposure to a traumatic event is what makes PTSD a distinct disorder. They raised the question of what would be post-traumatic about PTSD without exposure to trauma[5]. Other authors have emphasized the traumatic event as a problem in the diagnosis of PTSD: is it desirable to require a specific event as a diagnostic criterion, how should it be defined, how necessary is the trauma criterion for the development of PTSD symptomatology, and is the trauma criterion specific for PTSD, or could it be that it also occurs in other mental disorders (e.g., Weathers & Keane, 2007)?

Since its inception, the definition of Criterion A has been continually modified in the various DSM editions. For example, in the DSM-III the trauma definition was described very broadly ('The person has experienced an event that is outside the range of usual human experience and that would be markedly distressing to almost anyone' - see Table 1.2). This definition was criticized because many catastrophic events are common and not at all 'outside the range of usual human experience', and in addition, 'markedly distressing to almost anyone' is not a very concrete, objective description. The trauma definition continued to change over the years until the DSM-5. In addition, in the most recent version of the ICD (ICD-11), the PTSD trauma criterion is defined in a completely different and less strict way than in the DSM-5 (see Table 1.2).

There is a problematic relationship between the trauma criterion and the PTSD symptoms. First, in clinical practice there is often a circular reasoning: in the event of trauma, the diagnosis of PTSD is quickly made; and in the case of PTSD-like complaints, trauma is quickly assumed. Some researchers warn against overemphasizing the trauma criterion, because this criterion places excessive emphasis on PTSD as the primary outcome of catastrophic events and hinders recognition of other common outcomes such as depressive disorders, anxiety disorders,

4 Criterion A is usually referred to in the literature as 'traumatic stressor', 'traumatic event', 'potentially traumatic event' or simply 'trauma'. While in some literature 'trauma' is defined as the mental consequences of a traumatic event, in this dissertation 'trauma' will be used as the (potentially) traumatic event (PTE).

5 Some authors gave the answer, with some irony: without exposure to trauma, a syndrome following a nontraumatic stressor might be better named '*post stressor stress disorder*' and one associated with no identified stressor '*non stressor stress disorder*' (North et al., 2009).

somatoform disorders, and substance abuse disorders (Brewin et al., 2009, p. 370). Second, the suggestion could be made that the trauma criterion would be an unequivocal causative factor leading to PTSD. This presumption may place too much emphasis on the trauma criterion as the alleged cause of posttraumatic symptomatology. This will lead to neglecting other factors that may play an important role in PTSD, such as personal, social, and cultural factors, social support, coping styles, or cognitive appraisal (Olff et al., 2005). And third, most people who experience PTEs will never develop PTSD. Many people experience a PTE. Approximately 45% to even 80% of people have experienced a PTE in their life, whereas the lifetime prevalence of PTSD is around 5% to 10% (de Vries & Olff, 2009; Kessler et al., 2017; Knipscheer et al, 2020; Lui et al, 2017). So, there is no one-to-one relationship between a PTE and PTSD.

Table 1.2. The changing definitions of the Trauma Criterion

Edition	Shortened definitions of Trauma Criterion A	PTSD Symptoms
DSM-III (1980)	*The person has experienced an event that is outside the range of usual human experience and that would be markedly distressing to almost anyone*	3 Clusters; 12 symptoms
DSM-III-R (1987)	*The person has experienced an event that is outside the range of usual human experience and that would be markedly distressing to almost anyone, involving serious threat to life or physical integrity. (Usually the event is experienced with intense fear, terror, and helplessness.)*	3 Clusters; 17 symptoms
DSM-IV (1994) / DSM-IV-TR (2000)	A1: *The person must have experienced or was confronted with an event that involved actual or threatened death, serious injury, or physical integrity of self or others; or the person was learning about these events experienced by a family member or other close associate.* ***AND:*** A2: *The person's response involved intense fear, helplessness, or horror*	3 Clusters; 17 symptoms
DSM-5 (2013) / DSM-5-TR (2022)	*Exposure to actual or threatened death, serious injury, or sexual violence in ways like for instance, 'directly experiencing the traumatic event(s)', 'witnessing, in person, the event(s) as it occurred to others', or 'learning that the traumatic event(s) occurred to a close family member or close friend*	4 Clusters; 20 symptoms
ICD-11 (2018)	*Exposure to an event or series of events of an extremely threatening or horrific nature, most commonly prolonged or repetitive events from which escape is difficult or impossible*	3 Clusters; 6 symptoms

1.5 OBJECTIVES AND OUTLINE OF THE STUDIES

1.5.1. RELEVANCE OF THE STUDIES

Although PTSD has become extremely popular among clinicians, patients, and researchers from the 1980s to the present, many conceptual questions about PTEs and its psychological consequences remain open, as explained above. This merits and invites reflection and exploration of how PTSD as a diagnostic concept is constructed, how it emerged, what it is based on, how it manifests and how it relates to other mental disorders. In this dissertation, entitled *The multiple and the changing faces of psychotrauma and its psychological consequences* (by analogy with the title of the article by Schnurr, 2013), we will explore what a traumatic stressor or PTE actually is and discuss the heterogeneous psychic consequences such as PTSD.

This is relevant because it provides direction for exploring and refining theories about the definition and phenomenology of posttraumatic psychopathology and its causal and maintaining mechanisms. Knowledge about the definition of posttraumatic psychopathology helps in the (timely) identification of people with psychological complaints or disorders, in particular those whose symptoms do not fully fit within the currently defined PTSD concept. In these patients, it may be difficult to recognize trauma-related complaints and they may receive no or inappropriate treatment. In addition, it may also have direct implications for treatment itself. Even though there are many trauma-focused therapies with good effects, not all of these therapies appear to be unambiguously effective and a significant proportion (up to two third) of patients retain residual PTSD symptoms after psychotherapy (Jericho et al., 2022; Larsen et al., 2019). For these patients, it would be useful to investigate which specific trauma-related symptom profiles or specific trauma-related problems could play a role in this reduced treatment effectiveness. From there, targeted treatment interventions for these patients can be developed to increase the effectiveness of the treatment.

1.5.2. RESEARCH QUESTIONS OF THE STUDIES

The following research questions guided the work described in this dissertation:

1. What are the historic roots of PTSD, how did the definition of posttraumatic symptoms and syndromes (as scientists have defined them) come about, how have the symptoms and syndromes evolved and changed over time, and under what conditions and influences have they been shaped?
2. How specifically is the traumatic stressor criterion defined and how specifically is this criterion related to PTSD and to other mental disorders?
3. Within larger groups of traumatized patients, are there certain subgroups with different, distinguishable symptom profiles? And if so, what characteristics do these subgroups have?
4. Which components of PTSD, i.e., which distinct symptom clusters of PTSD according to the DSM-5, are associated with treatment outcome?

1.5.3. OUTLINE OF THE STUDIES

This dissertation consists of several studies.

Chapter 2 (*Unity or anarchy? A historical search for the psychological consequences of psychotrauma*) will focus on the historic roots of PTSD. As noted, PTSD was introduced in 1980 (APA, 1980) as a new diagnostic category. However, different descriptions of post-traumatic manifestations existed for quite some time in clinical practice as well as in scientific writings. Were these disorders defined in the same way as PTSD or are there differences? To answer these questions, we performed a historical or narrative review to shed light on the genesis, developments, manifestations, definitions, influencing factors, discussions, recurrent dilemmas and pitfalls of the posttraumatic concepts over the past century and a half.

Chapter 3 (*The relevance of trauma and re-experiencing in PTSD, mood, and anxiety disorders*) will focus on the trauma criterion. As described earlier, the definition of what constitutes a PTE has changed. These changes may have consequences for the diagnosis, for identification of possible trauma victims, for indication to specific treatment approaches, and for trauma-related research. Objectives of this study are, first, to investigate the impact of how the traumatic stressor criterion is defined. The second objective is to investigate the relationship between different PTE definitions and mental disorders like PTSD, anxiety disorders, and mood disorders.

Chapter 4 and ***5*** will both focus on diagnostic profiles in groups of traumatized patients. Findings may contribute to knowledge about the heterogeneity of symptoms and the possible subgroups of patients with different symptom profiles. We will explore psychopathology in large samples of traumatized veterans (***Chapter 4***: *Symptom severity in PTSD and comorbid psychopathology: A latent profile analysis among traumatized veterans*) and refugees (***Chapter 5***: *Severity profiles of posttraumatic stress, depression, anxiety, and somatization symptoms in treatment seeking traumatized refugees*). In these studies, we will examine if groups within these traumatized patients have specific symptom profiles and moreover, if specific symptom profiles can be predicted by the number and characteristics of, among others, traumatic event types, coping, gender, and personality dimensions.

In ***Chapter 6*** (*Associations between PTSD criteria and treatment outcome in traumatized veterans and police officers*) we investigate which components of PTSD may predict treatment outcome in a sample of traumatized veterans and police officers.

Lastly, we will summarize and discuss the results of the studies in ***Chapter 7.***

REFERENCES

Aftab, A., & Ryznar, E. (2021). Conceptual and historical evolution of psychiatric nosology. *International Review of Psychiatry*, *33*(5), 486-499. doi:10.1080/09540261.2020.1828306

American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4rd ed.). Washington, DC: Author.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.

Borsboom, D., Cramer, A. O., Schmittmann, V. D., Epskamp, S., & Waldorp, L. J. (2011). The small world of psychopathology. *PloS one*, *6*(11), e27407. doi:10.1371/journal.pone.0027407

Breslau, N., Chase, G.A., & Anthony, J.C. (2002). The uniqueness of the DSM definition of post-traumatic stress disorder: Implications for research. *Psychological Medicine, 32*, 573–576. doi:10.1017/S0033291701004998

Brewin, C. R., Lanius, R. A., Novac, A., Schnyder, U., & Galea, S. (2009). Reformulating PTSD for DSM-V: life after criterion A. *Journal of Traumatic Stress*, *22*(5), 366-373. doi:10.1002/jts.20443

Broman-Fulks, J. J., Ruggiero, K. J., Green, B. A., Kilpatrick, D. G., Danielson, C. K., Resnick, H. S., & Saunders, B. E. (2006). Taxometric investigation of PTSD: Data from two nationally representative samples. *Behavior Therapy*, *37*(4), 364-380. doi:10.1016/j.beth.2006.02.006

Carlier, I.V.E., Jongedijk, R.A., Lamberts, R.D., & Gersons, B.P.R. Nederlandse vertaling van de SCID- DES NOS (Dutch Translation of the SCID-DES NOS) (1992). *IGP-Project*. Amsterdam: Academisch Medisch Centrum, afdeling Psychiatrie

Dalenberg, C.J., Glaser, D., & Alhassoon, O.M. (2012). Statistical support for subtypes in posttraumatic stress disorder: The how and why of subtype analysis. *Depression and Anxiety, 29*, 671-678. doi:10.1002/da.21926

De Vries, G. J., & Olff, M. (2009). The lifetime prevalence of traumatic events and posttraumatic stress disorder in the Netherlands. *Journal of Traumatic Stress*, *22*(4), 259-267. doi:10.1002/jts.20429

Gersons, B.P.R. & Carlier, I.V.E. (1992), Post-traumatic stress disorder: A history of a recent concept. *British Journal of Psychiatry 161*, 742-748. doi:10.1192/bjp.161.6.742

Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress*, *5*(3), 377-391. doi:10.1002/jts.2490050305

Insel, T., Cuthbert, B., Garvey, M., Heinssen, R., Pine, D. S., Quinn, K., ... & Wang, P. (2010). Research domain criteria (RDoC): toward a new classification framework for research on mental disorders. *American Journal of Psychiatry, 167*(7), 748-751. doi:10.1176/appi.ajp.2010.09091379

Jericho, B., Luo, A., & Berle, D. (2022). Trauma-focused psychotherapies for post-traumatic stress disorder: A systematic review and network meta-analysis. *Acta Psychiatrica Scandinavica*, *145*(2), 132-155. doi:10.1111/acps.13366

Jongedijk, R.A., Carlier, I. V. E., Schreuder, B. J., & Gersons, B. P. R. (1995). Is er een plaats voor de Complexe Posttraumatische Stress Stoornis? PTSS en DES NOS nader beschouwd. *Tijdschrift voor Psychiatrie*, 37, 1, 43-54.

Jongedijk, R. A., Carlier, I. V., Schreuder, B. J., & Gersons, B. P. (1996). Complex posttraumatic Stress disorder: An exploratory investigation of PTSD and DES NOS among Dutch war veterans. *Journal of Traumatic Stress*, *9*(3), 577-586. doi:10.1007/BF02103666

Jongedijk, R. A. (2001). Psychiatrische diagnostiek en het DSM-systeem. *Tijdschrift voor Psychiatrie*, 5, 309-319.

Jongedijk, R. A. (2008). De gevolgen van psychotraumatische ervaringen: meer dan PTSS alleen? *Cogiscope, 08, 13, 17*.

Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., Cardoso, G., Degenhardt, L., de Girolamo, G., Dinolova, R.V., Ferry, F. and Florescu, S., ... & Koenen, K. C. (2017). Trauma and PTSD in the WHO world mental health surveys. *European Journal of Psychotraumatology*, *8*(sup5), 1353383. doi:10.1080/20008198.2017.1353383

Kleber, R. J. (2013). Epilogue: Towards a broader perspective of traumatic stress. In: R. J. Kleber, Ch. R. Figley & B. P. R. Gersons (Eds.), *Beyond trauma: Cultural and societal dimensions* (pp. 299-306). Springer Science & Business Media (reprint from 1995, Plenum, New York).

Knipscheer, J., Sleijpen, M., Frank, L., de Graaf, R., Kleber, R., ten Have, M., & Dückers, M. (2020). Prevalence of potentially traumatic events, other life events and subsequent reactions indicative for posttraumatic stress disorder in the Netherlands: a general population study based on the trauma screening questionnaire. *International Journal of Environmental Research and Public Health*, *17*(5), 1725. doi:10.3390/ijerph17051725

Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., ... & Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology

(HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology, 126*(4), 454. doi:10.1037/abn0000258

Larsen, S. E., Fleming, C. J., & Resick, P. A. (2019). Residual symptoms following empirically supported treatment for PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy*, *11*(2), 207. doi:10.1037/tra0000384

Lerner, P. & Micale, M. S. (2001). Trauma, Psychiatry, and History: A Conceptual and Historiographical Introduction. In M. S. Micale & P. Lerner (Ed.), *Traumatic pasts. History, Psychiatry, and Trauma in the Modern Age, 1870-1930* (pp. 1-27). Cambridge University Press.

Liu, H., Petukhova, M. V., Sampson, N. A., Aguilar-Gaxiola, S., Alonso, J., Andrade, L. H., ... & Kawakami, N. (2017). Association of DSM-IV posttraumatic stress disorder with traumatic experience type and history in the WHO World Mental Health Surveys. *JAMA Psychiatry*, *74*(3), 270-281. doi:10.1001/jamapsychiatry.2016.3783

Luxenberg, T., Spinazzola, J., & Van der Kolk, B. A. (2001). Complex trauma and disorders of extreme stress (DESNOS) diagnosis, part one: Assessment. *Directions in Psychiatry, 21*(25), 373-392.

Miller, M. W., & Resick, P. A. (2007). Internalizing and externalizing subtypes in female sexual assault survivors: Implications for the understanding of complex PTSD. *Behavior Therapy*, *38*(1), 58-71. doi:10.1016/j.beth.2006.04.003

North, C.S., Suris, A.M., Davis, M., Smith, R.P. (2009). Toward Validation of the Diagnosis of Posttraumatic Stress Disorder. *American Journal of Psychiatry*, *166*, 34–41. doi:10.1176/appi.ajp.2008.08050644

Olff, M., Langeland, W., & Gersons, B. P. (2005). Effects of appraisal and coping on the neuroendocrine response to extreme stress. *Neuroscience & Biobehavioral Reviews*, *29*(3), 457-467. doi:10.1016/j.neubiorev.2004.12.006

Reed, G. M. (2018). Progress in developing a classification of personality disorders for ICD-11. *World Psychiatry, 17*(2), 227–229. doi:10.1002/wps.20533

Regier, D.A., Narrow, W.E., Kuhl, E.A., & Kupfer, D.J. (2009). The conceptual development of DSM-V. *American Journal of Psychiatry*, *166*(6), 645-650. doi:10.1176/appi.ajp.2009.09020279

Schnurr, P.P. (2013). The changed face of PTSD diagnosis. *Journal of Traumatic Stress, 26*(5), 535-536. doi:10.2307/800744

Weathers, F. W., & Keane, T. M. (2007). The Criterion A problem revisited: Controversies and challenges in defining and measuring psychological trauma. *Journal of Traumatic Stress*, *20*(2), 107-121. doi:10.1002/jts.20210

WHO (2018). *International Classification of Diseases for Mortality and Morbidity Statistics* (11th Revision). Retrieved from https://icd.who.int/browse11/l-m/en

Young, A. (2007). 9/11: Mental health in the wake of terrorist attacks. *The Journal of Nervous and Mental Disease*, *195*(12), 1030-1032. doi:10.1097/NMD.0b013e31815c861f

Zachar, P., & Kendler, K. S. (2017). The philosophy of nosology. *Annual Review of Clinical Psychology*, *13*, 49-71. doi:10.1146/annurev-clinpsy-032816-045020

Zimmermann, J., Kerber, A., Rek, K., Hopwood, C. J., & Krueger, R. F. (2019). A brief but comprehensive review of research on the alternative DSM-5 model for personality disorders. *Current Psychiatry Reports, 21*(9), 92. doi:10.1007/s11920-019-1079-z

‚Die Lehre von den traumatischen Neurosen hat eine an Wandlungen und Kämpfen, an Aufbau und Zerstörungen reiche Geschichte. (.....) Es genügt daran zu erinnern, daß die ersten Mitteilungen in den ärztlichen Kreisen Aufsehen erregten und durchweg Zustimmung und Anerkennung fanden, daß sich dann bald und im immer wachsende Maße eine Gegnerschaft geltend machte, die den Kampf gegen die Lehre von den traumatischen Neurose mit größter Scharfe und bis zu ihrer scheinbaren Erschütterung führte.‘ [6]

‘*The theory of traumatic neurosis has a history fraught with revisions and struggles, with development and destruction. (….) The first accounts provoked great attention in medical circles, and because it found agreement and acceptance it soon brought to life a rapidly growing opposition which led the fight against traumatic neurosis with the utmost intensity until its apparent demise*.’ [7]

6 Retrieved from p. 3: Oppenheim, Hermann (1915). Der Krieg und die traumatische Neurosen. *Berliner klinische Wochenschrift, 11*, pp. 3-28.

7 English translation retrieved from p. 143: Lerner, P. (2001). *From traumatic neurosis to male hysteria: The decline and fall of Hermann Oppenheim, 1889–1919*. In: M. Micale & P. Lerner (Eds), Traumatic pasts: History, psychiatry, and trauma in the modern age (pp. 140-171). Cambridge University Press.

Unity or anarchy?
A historical search for the psychological consequences of psychotrauma

Published as:
Jongedijk, R.A., Boelen, P.A., Knipscheer, J.K., & Kleber, R.J. (2023). Unity or anarchy? A historical search for the psychological consequences of psychotrauma.
Review of General Psychology, 27, 3, 303-319. https://doi.org/10.1177/10892680231153096

2

ABSTRACT

The field of traumatic stress is often referred to as being in a state of controversy and lack of continuity. Throughout history, disputes repeatedly centered on defining the psychological consequences of severe adverse events and on their causes. Even to this day this is current. To understand these controversies, an extensive historical literature review is presented of how mental consequences of trauma have been described in history, of the circumstances in which this took place, and of the disputes that have influenced the conceptualization of these mental responses.

We found psychotrauma always being surrounded by controversy. Significant heterogeneity in symptom expression has been described over the centuries to this day. Some symptoms appeared steadily over many decades, but often each time period showed its own core symptoms. At syndrome level, we found an acute condition, one with longer duration, and a complex condition. Also here, definitions varied over the decades. Finally, causes have always been debated, such as biological, psychological, socio-economic, cultural, political, or legal.

To better reflect the described ongoing variation in symptomatology, a more flexible diagnostic approach is proposed with a combination of both staging and subtyping that offers room for a more flexible, symptom-oriented, and personalized perspective.

KEYWORDS
PTSD, psychotrauma, history of PTSD, diagnostic models, DSM, heterogeneity.

It is hard to find a province of psychiatry in which there is less discipline than this one. There is practically no continuity to be found anywhere, and the literature can only be characterized as anarchic (Kardiner, 1959, p.245).

2.1 INTRODUCTION

Throughout history, descriptions of the psychological aftermath of severe shocking or traumatic experiences have been reported. A common thread has been a constant dispute about the consequences of these events in terms of terminology, cause, and description of psychic posttraumatic symptoms and syndromes. The inclusion of the diagnostic category Post Traumatic Stress Disorder (PTSD) in DSM-III (Diagnostic and Statistical Manual, 3rd edition; APA, 1980) was an attempt to unify the psychotrauma field and has been described as a paradigm shift in the conceptualization of psychological trauma (Jones & Wessely, 2007). Nevertheless, also after 1980 the field of traumatic stress was described as in *a state of anarchy* (Boulanger, 1990), while others described the field as *shredded* or *truncated*, where central insights of earlier findings of trauma scholars were lost (Ehrenreich, 2003; Gersons & Carlier, 1992). Up to the present day, even the official diagnostic manuals show mixed opinions. While the PTSD definition in DSM-5 became very extensive (APA, 2013), the ICD-11 (International Classification of Diseases, eleventh edition; WHO, 2018) defined PTSD on the basis of only limited symptoms. So, in the coming years patients, clinicians, and researchers are faced with two official PTSD-concepts which do not convey much unity in the trauma-field.

To understand this lack of unity, it is imperative to look back into the history of psychotrauma (Ben-Ezra, 2011). A historical review provides important clues that shed more light on the genesis, developments and manifestations of psychological concepts over the centuries, allowing a better understanding of influencing factors, discussions, recurrent dilemmas and pitfalls about these changing concepts. This will not only lead to a better recognition and understanding of current discussions, but will also allow for better ways to define post-traumatic psychopathology and the dilemmas involved. Several questions are important here. For instance: why are scientists and clinicians repeatedly confronted with different concepts of trauma-related disorders and why are they still unable to reach agreement on what exactly post-traumatic psychopathology entails?

Accordingly, in the present article, we aimed to investigate the ways posttraumatic symptoms and syndromes evolved and changed over time, and under what conditions and influences this occurred. To this end, we employed a historical literature review. The broad scope of such a review is irreplaceable to track and examine the origins, progress, and changes of clinical concepts in time (Ferrari, 2015). This provides an opportunity to examine the literature on psychotrauma through the ages, starting with the first time concepts emerged in the scientific literature, then following their evolution in chronological order and summarizing clear trends. From there, we discussed the findings from a broader historical perspective

and described a direction from which desirable new developments in post-traumatic psychopathology can be better defined.

For this review, we first collected influential review articles published in scientific journals in the last thirty years. From there on, we collected other pivotal reviews and subsequently we retrieved original papers. Per era, a selection of the articles was made. The articles should include the description of specific traumatic or serious adverse life events. In addition, the psychological consequences associated with these events should be described. We limited our search to articles published in scientific journals in the English language, involving adults only. We made exceptions in case significant contributions were only described in book chapters or in non-English publications.

2.2 PSYCHOTRAUMA BEFORE THE INTRODUCTION OF PTSD

Although already in ancient times reports were made about psychological trauma and its consequences, the first to introduce the term 'psychic trauma' was, to our best knowledge, the German professor in neurology Eulenburg in 1878. He regarded 'psychic trauma' as a sudden action of tremendous emotions that could cause a molecular concussion of the brain, which he compared with the concussion of the brain after physical trauma (Van der Hart & Brown, 1990).

It is important to emphasize that attention for psychotrauma and its consequences developed along the lines of societal changes (see Table 2.1). For the period before the introduction of PTSD in 1980, these developments will therefore be discussed along four domains: the industrial revolution, war and combat, disasters, and domestic and sexual violence.

2.2.1. INDUSTRIAL REVOLUTION

During the second half of the 19th century, clinicians were confronted with patients who, next to physical casualties, exhibited psychological complaints after accidents and calamities. Victims were mainly working class men, who worked in construction sites and factories, as well as victims of accidents because of the rapidly increasing use of trains (Weisaeth, 2002). In several European countries accident insurances were introduced providing financial compensation for injured victims. The combination of societal, clinical and legal contexts in this episode had a significant impact on the diagnostic developments of the consequences of these serious events.

The often serious railway-accidents with many casualties led to significant societal concern, especially in Great-Britain. In 1866, the physician Erichsen described the 'railroad spine syndrome', which consisted of a variety of symptoms including anxiety, distressing dreams, disturbed sleep, irritability, startle response, memory problems, and multiple somatic symptoms. Whereas Erichsen believed in an organic damage of the spinal cord, the London

surgeon Page argued in 1885 that not physical injuries but fright, fear, and alarm caused the disorder he called 'nervous shock'. From that moment on, an important shift in thinking about the consequences of trauma started (DiMauro et al., 2014; Kinzie & Goetz, 1996).

Table 2.1. Historical overview of described syndromes after traumatic events.

French Wars (1792-1815)
Nostalgia; Cardiorespiratory Neurosis, Syndrome du Vent du Boulet
Crimean War (1853-1856)
Palpitations; Crimean Fever
American Civil War (1861-1865)
Nostalgia; Irritable Heart Syndrome; Soldiers Heart; Disordered Actions of the Heart
Railway incidents (around 1867-1885)
Tunnel Disease; Railroad Spine Syndrome; Railway Brain; Concussion of the Spine; Rückenmarken Erschütterung
Industrial revolution (1860-1914)
Traumatic Hysteria; Traumatic Neurosis; Schreck Neurose
Russian-Japanese War (1904-1905)
Kriegsneurose
World War I (1914-18)
Shell Shock; Granatkontusion; Traumatic Neurosis; War Neurosis; Kriegsneurose; Névrose de Guerre; Effort Syndrome; Battle Shock; Battle Hysteria; Combat Exhaustion/ Fatigue; Combat Stress Reaction; Blast Concussion; Shell Fever; Granatfieber; Gas Neurosis; Gas Hysteria; Kriegshysterie; Stacheldraht Krankheit; Granatexplosionslähmung, Kriegszitter; L'hypnose des Batailles
World War II (1939-45)
Effort syndrome; Posttraumatic Psychoneurosis; War Neurosis, Post-concentration Camp Syndrome; Survivor Syndrome; Chronic Identity Diffusion; War Sailor Syndrome
Buffalo Creek Disaster (1972)
Buffalo Creek Syndrome; Long-Term Character Change; Posttraumatic Decline
Vietnam war (1955-1975)
Catastrophic Stress Disorder (CSD); Post-Vietnam Syndrome; Posttraumatic Stress Disorder; Acute Stress Disorder; Post-traumatic Self Disorder; Malignant Post-Vietnam Stress Syndrome; Survivor Syndrome; Posttraumatic Decline; Posttraumatic Demoralization Syndrome
Sexual Trauma
Rape Trauma Syndrome; Battered Women Syndrome; Disorders of Extreme Stress Not Otherwise Specified (DESNOS)
Gulf Wars (1991)
Desert Storm Syndrome; Gulf War Syndrome; Blast Trauma Syndrome
Other:
Enduring Personality Change after Catastrophic Experiences (EPCACE); Post-Torture Syndrome; Complex PTSD; Cumulative Trauma Disorder (CTD); Betrayal Trauma; Posttraumatic Embitterment Disorder (PTED); Prolonged Duress Stress Disorder; Posttraumatic Relationship Disorder (PTRS)

In the 1880s, the famous Parisian professor in neurology Charcot investigated patients with hysteria. Remarkably, he did not associate hysterical symptoms with traumatic events in his female patients, while he did in his male patients with serious accidents at work. These men were suffering from what he called 'traumatic hysteria', which encompassed a great variety of symptoms. First, there were aberrations of sensibility, especially anesthesia and

hyperesthesia, and visual disturbances like double vision or even blindness. Second, patients exhibited neurological motor symptoms, like paralyses and spasms. Third, Charcot described a wide range of other symptoms, like chest palpitations, chest pain, dizziness, and language disorders such as stuttering and mutism (Ellis, 1984; Micale, 1990).

In Berlin, one of the leading German neurologists Oppenheim also worked with work-related psychic complaints and he was the first to formulate the notion of a syndrome called 'traumatic neurosis' in 1888. Since Oppenheim wanted to equate somatic and mental disorders after major accidents in the context of German insurance procedures, he emphasized, much more than Charcot, that the traumatic experiences are the 'real cause' of the disorder. To his opinion, the magnitude of the fear during the traumatic event resulted in microscopic brain damage with symptoms developing from an often initial paralysis to a more long-lasting change in mental functions. Oppenheim located the disorder somewhat between hysteria and neurasthenia, with next to shaking, paralyses and disturbances in sight, also melancholic mood, fear, irritability, palpitations, pressure on the breast, and insomnia (Holdorff, 2011; Schmiedebach, 1999).

In short, this period was characterized by profound social and industrial changes, with many casualties of accidents, resulting in loss of labor and increasing financial support legislation for the injured. These societal developments urged clinicians to develop clear definitions of medical consequences of traumatic events. In this way, partly under societal pressure, clinicians increasingly worked in a complex medical, social, political, legal and moral context that fueled heated academic disputes over symptoms, diagnoses and causes (Gersons & Carlier, 1992; Weisaeth, 2002). In particular in Germany, several prominent neuropsychiatrists heavily disputed Oppenheim's 'traumatic neurosis', and proposed to abolish the concept. In 1890 at an international meeting in Berlin they stressed the role of simulation and social causes such as civilization and the German accident insurance legislation. In addition to simulation, the diagnosis of hysteria was brought to the fore, which would not be specifically caused by the (external) traumatic experiences themselves, but rather by (internal) imaginative desires and constitutional dispositions (Holdorff, 2011; Lerner, 2003).

In 1891, also The Lancet seriously questioned the concept of 'traumatic neurosis' because it tended to contain far too many symptoms and causes, including signs of simulation, malingering, organic nerve injury, hysteria, shock of the cerebrospinal system, neurasthenia and psychosis (Rollin, 1990).

2.2.2. PSYCHOTRAUMA IN WAR AND COMBAT

Before World War I

Already in ancient times, reports were made about psychic symptoms following combat. Descriptions were made of grief, guilt, numbness, anger, intrusions, nightmares, dissociation, and somatic symptoms (see e.g., Ben-Ezra, 2011; Birmes et al., 2003, 2010; Ellis, 1984).

Until well into the 19th century, the relationship between traumatic combat experiences and psychological complaints was rarely recognized in scientific literature (Kinzie & Goetz,

1996; Kloocke et al., 2005): if a soldier had a mental breakdown, this was interpreted as a suffering from circumstances like heat, homesickness, heavy packs, or pinching belts (Jones & Wessely, 2001; Rosen, 1975). An exception was Pinel, a French physician and pioneer of early psychiatry, who around 1798 was one of the first to specifically associate mental symptoms with terrifying wartime experiences and coined the term 'cardiorespiratory neurosis' (Crocq & Crocq, 2000).

In the Crimean War (1854-1856), Handfield Jones described 'Crimean fever' which was characterised by pains in the limbs, irritable heart, agitation, and exhaustion. Shortly thereafter, in the American Civil War (1861-1865), cardiac disorders became the most prominent sign among soldiers, described by military physicians like Hawthorne, Maclean, Myers, and Da Costa. The disease was named 'soldiers heart' or 'irritable heart syndrome', and encompassed rapid and feeble pulse, palpitations, chest pain, shortness of breath, and extreme fatigue. Other symptoms were disturbed sleep with unpleasant dreams, melancholy, and gastrointestinal symptoms (Jones & Wessely, 2001; Kinzie & Goetz, 1996; Ray, 2008). Some years later during and after the Russian-Japanese war (1904-1905), the German physician Honigmann was in 1907 probably the first to coin the term 'Kriegsneurose' ('war neurosis') and depicted the similarities between traumatized soldiers and Oppenheim's traumatized civilians (Crocq & Crocq, 2000).

Concluding, from ancient days on several war-related symptoms were described. Especially, in the 19th century clinical emphasis became more and more on physical symptoms like heart disease, general weakness, gastrointestinal symptoms, and exhaustion. This probably was due to a major paradigm shift: around 1869 the new concept of 'neurasthenia' (described as enfeeblement of the nervous system without organic lesion) obtained a dominant position in psychiatry. This meant an important change in psychiatric nosology resulting in a time-bound mechanical view on stress and psychopathology. The term 'war neurasthenia' became popular as a catch-all for unexplained symptoms in soldiers with no apparent physical injuries (Bogacz, 1989; DiMauro et al., 2014).

World War I: not just Shell Shock

During World War I (WWI; 1914-1918) the 'irritable heart syndrome' remained widespread, together with other concepts like 'war neurasthenia' and 'traumatic hysteria'. However, WWI was above all the war of 'shell shock', a term introduced by Myers (1915). 'Shell shock' was originally seen as a form of commotio cerebri that was a result of powerful compressive forces but soon it also became related to frightening experiences like horrible sights and the fright of being buried alive (Wiltshire, 1916). Soldiers, often coming directly from the battle fields and trenches, were described as suffering from neurological symptoms like tremors and paralyses, neurasthenic symptoms, and symptoms of anxiety. When it became clear that enormous numbers of soldiers were suffering from 'shell shock', and hence were being discharged from service, authorities tried to restrict and discourage the use of the term, or even tried to abolish it. This lead to remarkable new alternative diagnoses, like 'malingering', 'pension wish

neurosis', and 'not yet diagnosed – nervous'. And even very cruel treatment methods were used by army doctors, such as painful electrical treatments as an aversive therapy that caused the men to return to the front (Freud, 1955; Jones et al., 2007; Mosse, 2000; Weisaeth, 2002).

While in Germany Oppenheim again began to defend the concept of 'traumatic neurosis' at the start of WWI, again important scholars especially the influential German psychiatrist Bonhoeffer, vehemently opposed his view. Ultimately, Oppenheim's concept was rejected for the second time, at the 1916 War Conference in Munich. Central theme in the dispute was whether the cause of the disorder was psychological or physical. The leading opinion among a significant part of the experts was that without physical lesions, weakness, a deficiency of will-power, and simulation were the principal reasons for patients to present this 'social disease' (Bonhoeffer, 1926; Lerner, 2003). Interestingly, in the period after the war, a new generation of German psychiatrists embraced the concept again, in order to better understand their traumatized patients (Holdorff, 2011; Kloocke et al., 2005; Schmiedebach, 1999). And also, the Viennese psychoanalyst Freud wrote about war neurosis after the war, as early as 1919. He believed that simulation was rare and he observed how traumatized patients acted as if they were in the traumatic situation again (Freud, 1955). Many decades after WWI, the complaints of many traumatized veterans continued, as American psychiatrist and psychoanalyst Kardiner described in his important book 'The Traumatic Neuroses of War' (Kardiner, 1941). He described long-lasting symptoms, which later influenced the definition of trauma-related disorders in the 1952 and 1980 DSM editions.

In sum, in many countries, causes, symptoms, and even the existence of psychological consequences of war were discussed heavily. Just as was the case in the context of the industrial revolution, also here the enormous societal pressure influenced the professional debates. In both cases there was fear of costs for financial compensation and fear for lack of manpower. Holdorff (2011, p. 472) described the problematic aspects of these dynamics: 'Under the pressure of political, military and conceptual circumstances, physicians bent medical ethics and departed from their traditional individual focus in favour of new social ethics and political commitments.'

World War II: combat related trauma

To avoid another epidemic of 'shell shock' once World War II (WWII; 1939-1945) started, British authorities again tried to ban the term as a preventive measure. Still, already at the beginning of the war discussions about post-combat syndromes came ahead. The general opinion was that only those with a pre-combat constitutional vulnerability would not recover naturally once removed from danger (DiMauro et al., 2014; Jones & Wessely, 2007). This opinion grew problematic since many soldiers of both sides of the war developed long-lasting symptoms similar to those described in WWI: physical symptoms like tremor, fatigue, gastro-intestinal problems, poor memory, and also psychological symptoms like anxiety, nightmares, irritability, and startle reactions (Engelbrecht et al., 2018; Jones et al., 2007; Kloocke et al., 2005).

Studies conducted directly in and after WWII are scarce. Grinker and Spiegel (1945)

identified anxiety as a core symptom next to several other mental complaints in soldiers in Northern Africa in 1943. Swank (1949) distinguished four groups of symptoms in a sample of WWII soldiers: emotional, cognitive, physical, and hysterical symptoms. Also, research on the long-term consequences of WWII combat is sparse. Prominent exceptions are the two studies of veterans in the 1960s, reporting many symptoms later defined in PTSD (Archibald et al., 1962; Archibald & Tuddenham, 1965).

Despite the limited research, these studies significantly influenced the definition of later PTSD, with findings of the chronic nature of post-combat symptoms and that even soldiers without a pre-war vulnerability could develop chronic symptoms (Archibald & Tuddenham, 1965; Swank, 1949).

World War II: the consequences of the concentration camps

After WWII, the deeply intrusive and far-reaching psychological consequences in victims of the Nazi concentration camps were studied. Especially in the Netherlands, several physicians and camp survivors themselves, like Tas, De Wind, and Cohen (see Cohen, 1981; De Wind, 1972) but also Thygesen from Denmark, published their experiences and observations shortly after the war. Friedman (1949) was probably the first to publish a scientific paper about camp survivors. But on the whole, not until many years later several important clinicians and researchers in the field followed. Those were among others, Hermann and Thygesen (1954) in Danmark, Bastiaans (1957) in the Netherlands, Eitinger (1961) in Norway, Von Baeyer (Von Baeyer et al., 1964), Venzlaff, and Lederer (mid 1960s) in Germany, and Krystal and Niederland (1968) in the US. Early research was hampered by societal influences such as an emphasis on civilian reconstruction and a lack of understanding of the camp survivors' extreme experiences. And here too controversies arose about the origins of complaints. Next to psychological theories, several authors pointed out a relation between complaints and brain damage caused by injury, illness, and extreme starvation in the camps (e.g., Eitinger, 1961; Venzlaff, 1964).

Even though most of the mentioned authors described case observations, the degree of agreement on symptoms was remarkably high. They defined the 'post concentration camp syndrome' or 'survivor syndrome' as a different syndrome compared to the classical 'traumatic neurosis'. For instance, Bastiaans (1957) described the syndrome as more complex, with chronic over-activity, aggression, despair, psychosomatic complaints, and a permanent blockage of human relations. Niederland (1968, p. 313) stated: 'The concept of traumatic neuroses does not appear to cover the multitude and severity of clinical manifestations of the survivor syndrome.' Therefore, Niederland wanted to sharpen the distinction between the two disorders to indicate that this type of traumatization is of such magnitude, severity, and duration that a recognizable clinical entity must be defined. Based on clinical observations of close to 2000 survivors of Nazi concentration camps, he described the 'survivor syndrome' in seven symptom clusters namely, symptoms regarding anxiety, cognition and memory, depression, psychosis/dissociation, personal identity, psychosomatic conditions and apathy (Niederland, 1968, 1981).

Concluding: in case of the extreme and long-lasting, dehumanizing traumatisation of victims of the Nazi concentration camps there was the need to define a syndrome with a more extensive and complex symptom constellation next to the already existing 'traumatic neurosis'. This was a completely new development in trauma diagnostics: a split was made in which not one but two trauma syndromes were found necessary.

2.2.3. DISASTER RELATED TRAUMA

Already in the ancient world there were reports of emotional reactions due to suffering (Birmes et al., 2010; Kinzie & Goetz, 1996). Much later are the well documented descriptions concerning the 'Great Fire of London' in 1666 by the two famous diarists Evelyn and Pepys. Evelyn observed an acute reaction, described as a state of shocked inertia and passivity (Parry-Jones & Parry-Jones, 1994), whereas Pepys reported about complaints until five months after the fire, especially symptoms of re-experiencing and sleeping difficulties (Daly, 1983). In 1765, Ignazio Somis reported extensively about victims of a large snow avalanche disaster in the Italian Alps. He also described an acute, transient stress response for some days with immediate loss of senses, fright, and faint and besides a longer lasting reaction which pursued for years, with nightmares, daily intrusions, avoidance behaviour, and autonomic hyperarousal (Parry-Jones & Parry-Jones, 1994).

From the beginning of the twentieth century onwards, several disaster related studies were conducted (see e.g., Norris et al., 2002; Weisaeth, 2002). The Swiss physician Stierlin (1911) systematically studied the reactions of survivors after the Courrières mine (1906) and the Messina earthquake (1908) disasters. Remarkable, he again described the two different mental reactions: an acute and transient reaction usually lasting for some days with clouded consciousness, disorientation, and fearful affect and another of longer duration that included loss of energy, sleep disturbances, and nightmares. Important other studies were on victims of the 1906 earthquake in San Francisco by James (1911) and victims of ship explosions by Hesnard (1914). Adler (1943) described the disastrous fire of the Coconut Grove nightclub in Boston, with a variety of symptoms like irritability, fatigue, insomnia, fears and nightmares, hostility, avoidance, and physical symptoms.

In the 1970s, various studies on the effects of the 1972 Buffalo Creek flood disaster gave increased attention to disaster research. Importantly, in these studies, next to the previously described 'acute and transient reaction' and the 'reaction of longer duration', a third kind of post-disaster syndrome was mentioned. This 'Buffalo Creek syndrome', described as 'long-term character changes' or 'post-traumatic decline', encompassed symptoms of over-control and rigidity, social isolation, hostility, feelings of helplessness, and demoralisation (Lindy & Titchener, 1983; Titchener & Kapp, 1976).

In sum, disaster researchers delivered thought-provoking findings. Even three types of post-disaster psychological disorders emerged. First, an acute and transient reaction to the sudden threat was described, second, a condition of a longer duration, and third, a more far-reaching and severe syndrome with even characterological changes. The latest observations

in particular showed important similarities with findings from the field of concentration camp survivors, although it is remarkable that the disaster studies hardly made any reference to this.

2.2.4. DOMESTIC AND SEXUAL TRAUMA

While Charcot had no regard for traumatic events as an origin of hysteria in women, in later years the relation between hysteria and adverse, often sexual life events in childhood became more recognized. It was Janet who introduced a new way of looking at this relationship. From 1886 onwards, he explored and described extensively the role that dissociation played in unresolved traumatic memories (Birmes et al., 2003; Van der Hart & Horst, 1989). In the same period, Freud wrote in 'About the aetiology of hysteria' (1896) that sexual experiences in early childhood were the basis for the development of many psychic symptoms in later life. But while Janet stuck to his vision of sexual trauma, Freud soon left his theory about the importance of early childhood sexual experiences (Van der Kolk & Van der Hart, 1989).

Gradually, the attention on sexual trauma decreased. One reason for this was the dominant position within psychology and psychiatry of Freud's psychoanalysis, which had strayed from sexual trauma. Furthermore, in contrast to events such as wars or natural disasters that disrupt society, domestic violence could more easily remain invisible and hidden for long periods of time (DiMauro et al., 2014). Around the 1970s a revival arose, largely because of the influence of the female rights movement. Several influential papers dealing with domestic and sexual violence were published. Burgess and Holmstrom (1974) paved the way for the later PTSD in DSM-III by describing the 'rape trauma syndrome', with re-experiencing symptoms, avoidance, high startle responses, triggers related to the events, but also a damaged sense of safety, suicidality and severe problems in relationships. In another syndrome, the so-called 'battered women syndrome', particular attention was paid to the mechanism of learned helplessness (Gayford, 1975; Walker, 1977).

So after an initial focus on, and then a long pause in thinking about sexual and domestic violence, a new important development came to the fore from the 1970s onwards. Again, driven by an influential citizen movement and prominent clinical advocates, severe symptom constellations emerged, some of which were not covered by existing diagnostic categories. The influence of these researchers had a significant impact: eventually their findings led to new, highly influential complex trauma concepts.

2.3 PSYCHOTRAUMA AND THE DSM AND ICD CLASSIFICATIONS

2.3.1. DSM-I, DSM-II, AND THE PRELUDE TO PTSD

The run-up to the DSM

After mid-19th century, German was the international language in psychiatry and German-speaking physicians dominated the classification of mental disorders. The most influential

of them was Kraepelin, professor of psychiatry in Heidelberg. In the highly influential eighth edition of his textbook (published between 1909 and 1915), he described a classification of psychiatric syndromes based on observed clinical and not biological grounds. Several developments made an end to the rich German diagnostic traditions. First, World War II ended German influence as the international language of science, including psychiatry. The initiative shifted to the US, where there was practically no tradition in psychiatric classification. Second, because of their wartime experiences, many American physicians especially had experience with patient groups that differed greatly from those of their German colleagues, namely non-institutionalized and non-psychotic patients. And third, psychoanalysis was on the rise in post-war psychiatry, partly because of the need to focus on this relatively new patient group. This too was an important development, because psychoanalysis, in general, was not very concerned with classification (Grob, 1991; Shorter, 2015).

The road to PTSD in DSM-III

In October 1945, a committee under the supervision of the US psychiatrist Menninger, who was a general in WWII, launched the 'Medical 203 Bulletin', which consisted of a nosology largely based on psychodynamic principles and can be considered the predecessor of the DSM-I. In 1952, the American Psychiatric Association APA took the initiative and launched the first edition of the DSM. This DSM-I introduced a new stress and trauma-related syndrome called 'gross stress reaction' (GSR), based on the work of among others Grinker, Spiegel, and Kardiner who also worked in the military during WWII. The disorder represented a transient overwhelming fear response to an extreme external stressor in a person without previous mental problems. The reaction should disappear after the person no longer was exposed to the stressful situation. This definition was in line with older theories and suggested that long-lasting conditions could only occur in the presence of predisposing mental disorders. In the DSM-II (1968) GSR was replaced by 'transient situational disturbances' which was not a specific trauma-related category at all. As a result, DSM-II missed a specific trauma-related disorder. It has been suggested that the lack of such a disorder was due to the fact that none of the APA committee members had experience with combat-related disorders (Scott, 1990).

At that time, the Vietnam War had already started for the US but the most serious consequences of this war became more visible to American society in the 1970s, including with the marches of the 'Vietnam Veterans against the War', immense numbers of veterans that were in need for psychosocial help, a shifting public opinion about the war, and influential psychiatrists such as Lifton and Shatan vehemently opposed to the war. These developments led to what Shatan (1973) and later Friedman (1981) defined as the 'post-Vietnam syndrome': a delayed and long-lasting trauma syndrome, with grief and guilt related symptoms, rage, numbing, alienation, intrusive nightmares, drug dependence, depression, and anxiety.

Remarkably, in the early development of the DSM-III around 1974 again no trauma-related diagnosis was planned. Some US-research groups argued heavily that existing diagnoses covered the symptoms of traumatized Vietnam veterans adequately. But Shatan, Lifton and

others had set up a working group to vigorously oppose this view. WWII experts Niederland and Krystal joined, as well as among others the stress-expert Horowitz and the US professors in psychiatry and DSM-III task force members Andreasen and Spitzer. The merger of these specialists broadened the scope to all kinds of traumatic events. Together they formed a strong and successful lobby and eventually defined a new syndrome which they termed 'catastrophic stress disorder' or 'CSD' (Scott, 1990).

The development of this new disorder had noteworthy similarities with the mechanisms earlier clinicians were faced with in trying to describe the mental consequences of catastrophic events: social pressure and unrest, lobbying by (politically) engaged clinicians and patients, and a need to acknowledge the overwhelming suffering after horrific experiences, ensured that a new diagnosis appropriate for the time was created. And here too, opposing forces emerged that saw no benefit in the newly made diagnosis. It looked like a repeat of earlier described motions: the oscillation between the denial of the existence of a psychotrauma syndrome and the strong forces to name and define such a syndrome.

2.3.2. A NEW SYNDROME: PTSD

In 1978 it was decided that the symptom profile of 'CSD' would be included in the DSM-III (APA, 1980), under the name of 'PTSD'. The new syndrome was supposed to give more clarity for clinicians, researchers as well as patients. In addition to the experimental research of Horowitz (1976) in particular, research into the diagnostic criteria of PTSD was largely based on only a limited number of studies. Besides, the diagnosis was strongly promoted by a community-driven group of psychiatrists and veterans who worked together to place the diagnosis in the DSM-III. The latter two points have led some scholars to argue that the introduction of PTSD was largely the result of strong lobbying efforts, particularly motivated by societal forces (Jones & Wessely, 2007; Scott, 1990; Turnbull, 1998). In general, however, it can be said that both medical, psychological and societal influences converged at a time when there was an urgency to understand (and treat) the suffering of individuals. However, these developments have made PTSD an objectively created reality for many professionals, rather than being seen as a construct from a diversity of time-bound perspectives (Frueh et al., 2010).

The definitions of PTSD from DSM-III to DSM-IV (APA, 1994) were largely the same. In essence the criteria were grouped in symptom clusters of respectively re-experiencing, avoidance, and hyperarousal. As a whole, the grouping of criteria in these three symptom clusters narrowed the definition of PTSD in a significant way: PTSD lost several symptoms seen in earlier literature, like interpersonal problems, personality features, and especially physical symptoms. In particular, the somatic symptoms were subsumed under non-trauma-related disorders, such as somatization disorders and conversion disorder.

In the DSM-IV a new diagnosis was introduced, the 'acute stress disorder' ('ASD'): an acute and temporary condition with dissociative symptoms, and symptoms of re-experiencing, fright and hyperarousal (APA, 1994). Whereas acute mental reactions after psychotrauma are described throughout history, especially after sudden, overwhelming events like disasters,

shortly after its introduction the disorder was already criticized because it might medicalise a normal transient reaction, and because of the limited value to predict PTSD (Marshall, Spitzer, & Liebowitz, 1999).

The World Health Organisation (WHO) introduced a section of mental disorders for the first time in the ICD-6 (1948), with a trauma-related disorder called 'Acute situational maladjustment' including a 'combat fatigue' subtype. The ICD-8 (1967) and ICD-9 (1978) of the World Health Organisation were very similar to the DSM-II of the American Psychiatric Association. But when DSM-III was launched in 1980, a radically new classification was created which had little connection with the ICD-system anymore. Within ICD-9 a coding scheme was developed for DSM-III categories but ICD-10, published in 1993, had its very own section for mental disorders (WHO, 1993). Although this section still was more or less compatible with the DSM, it was not the same, and as a result, from this point on, an important development was set in motion where the two major diagnostic classification systems went their separate ways (Peters et al., 1999).

Thanks to all these developments, after the introduction of PTSD in 1980, the field of psychotrauma has flourished. The number of scientific publications on PTSD has increased considerably over the years, several journals have emerged that focus purely on trauma and various associations have been founded, such as the International Society for Traumatic Stress Studies (ISTSS) in 1985 and the Division56 of the American Psychological Association (APA) in 2006.

2.3.3. AFTER PTSD: HETEROGENEITY AND COMPLEXITY REVISITED

Despite the desire to unify the psychotrauma field, fundamental criticism persisted after the introduction of PTSD in 1980. Among others, the overlap and similarities with other diagnoses was in debate, but also the way PTSD was defined. In particular, several authors *again* missed numerous symptoms especially in complex traumatized patients and made several suggestions to overcome the identified shortcomings. For instance, it was suggested to look beyond classification and better define PTSD as a spectrum disorder, defined with core PTSD-symptoms like re-experiencing, and besides numerous heterogeneous symptoms that especially could be identified in severely traumatized patients (Ciccone et al., 1988; Kolb, 1989; Lerer, 1988). Nevertheless, strict diagnostic categorization continued to be preferred, as many authors attempted to re-formulate novel syndromes after prolonged and severe suffering like e.g., 'Posttraumatic Character Disorder' (Horowitz, 1986), 'Post-Traumatic Self-Disorder' (Brende, 1983; Parson, 1984), 'Malignant Post-Vietnam Stress Syndrome' (Rosenheck, 1985), 'Post-Combat Survivor Syndrome' (Goderez, 1987), and 'Post-Traumatic Demoralization Syndrome' (Parson, 1990) (Table 1). Most of these syndromes were based on observations in Vietnam veterans and included symptoms like pronounced identity and personality changes, social isolation, self-destructive and violent behaviour, affective instability, guilt, shame, suicidality, and use of drugs and alcohol.

A similar development was visible in another psychotrauma field. The attention for

especially early childhood sexual abuse grew in the 1980s. Several authors reported high incidences of physical and sexual violence among psychiatric patients and described trauma-related symptoms like depression, anxiety, self-destructive behaviour, poor self-esteem, substance abuse, and a tendency towards revictimization (e.g., Bryer et al., 1987; Herman et al., 1986; Terr, 1991). Soon thereafter, Herman (1992) introduced a new syndrome named 'Disorders of extreme stress, not otherwise specified' ('DESNOS'), also called 'complex PTSD'. 'DESNOS' was supposed to be associated with severe and repeated interpersonal abuse and consisted of a wide variety of symptoms, classified into clusters such as alterations in regulation of affect and impulses, consciousness, self-perception, relations with others, somatic symptoms, and systems of meaning (Herman, 1992; Luxenberg et al., 2001).

The new syndrome was investigated in field trails (Van der Kolk et al., 2005) and for instance, in studies with patients with repeated interpersonal traumatization (Roth et al., 1997; Zlotnick et al., 1996) and in combat veterans (Jongedijk et al., 1996; Newman et al., 1995). Despite research efforts and, also here, lobbying by dedicated clinicians, 'DESNOS' was not officially adopted as a distinct disorder in DSM-IV. This was mainly due to the limited amount of research available at the time, concerns about the clinical utility of the very broad and mixed symptom profile, and its problematic distinction from other disorders, especially the Borderline Personality Disorder (Luxenberg et al., 2001). Despite this, 'complex PTSD' gained widespread following among clinicians as well as patients (Veissière, 2021). Both felt recognized that the consequences of severe, long-term events went beyond what they believed to be limiting symptoms of PTSD.

Unlike DSM-IV, the ICD-10 did included a trauma category associated with the concept of 'DESNOS'. The disorder was called 'Enduring personality change after catastrophic experiences' or 'EPCACE' (WHO, 1993). The first drafts of 'EPCACE' were already made around 1985 by the Norwegian WWII expert Eitinger (Malt et al., 1996). Symptoms of 'EPCACE' included pervasive hostility, mistrust, social withdrawal, feelings of emptiness, chronically vigilance, and estrangement. In a review of expert's opinions, the features 'hostility' and 'mistrust' were ranked as most important symptoms (Beltran et al., 2008). The precipitating stress should be of an extreme nature in order to plausibly account for the observed personality change, irrespective of the person's prior level of adaptation (WHO, 1993). 'EPCACE' was not supported by robust research, resulting in a weak empirical basis. Moreover, some experts pointed at the lack of specificity of its criteria and the potential overlap with other mental disorders (Beltran & Silove, 1999). These concerns parallel the concerns about 'DESNOS'.

In short, as described in previous periods, a diagnostic gap in trauma diagnosis was also found here: heterogeneous symptoms after especially enduring, far-reaching traumatic experiences were not covered by the existing disorder PTSD. Whereas most of the described syndrome names did not caught hold, the urge to fill the gap more sustainably became more and more prominent and influenced the development of recent concepts radically.

2.3.4. MOST RECENT DEVELOPMENTS: DSM-5 AND ICD-11

In the run-up to the DSM-5, there was again discussion about the PTSD concept. Challenging paper titles like 'PTSD: a problematic category' (McHugh & Treisman, 2007) or 'Saving PTSD from itself in DSM-V' (Spitzer et al., 2007) showed the dispute with regard to core assumptions, hypothesized mechanisms, validity and clinical utility of PTSD.

Finally, PTSD entered the DSM-5 with rigorous changes (APA, 2013). Called as 'the changed face of PTSD' (Schnurr, 2013), the disorder no longer was classified as an anxiety disorder but was included in a new chapter of disorders related to stressful events. This change was supposed to reflect the recognition that not all traumatizing events are threat-based and posttraumatic stress not always includes fear as the hallmark emotion (Friedman, 2013). Furthermore, the symptom clusters were extended from 3 to 4, and included 20 separate symptoms (17 in DSM-IV). In a new cluster termed 'negative cognitions and mood', existing PTSD-symptoms were accommodated but also new symptoms were added like e.g., persistent distorted blame of self or others, horror, guilt, shame, and self-destructive behaviour. Furthermore, a dissociative subtype for PTSD was distinguished, with depersonalization and derealisation symptoms. Accordingly, the DSM-5 characterized a broad scope of post-traumatic responses, with many heterogeneous symptoms besides anxiety-related responses.

The broadened PTSD concept was criticized by several authors. PTSD underwent more changes than any other mental disorder (Hoge et al., 2016) and was the disorder with the most extensive number of criteria in DSM-5, with 636.120 ways to have PTSD (Galatzer-Levy & Bryant, 2013). Whereas at the time it was decided not to include DESNOS or complex PTSD in DSM-IV, critics argued that in DSM-5 PTSD became rather 'DESNOSish' because of the breadth and variety of symptoms (Maercker & Perlkonnig, 2013). On the other hand, it was claimed that adding relevant symptoms would encourage clinicians and researchers to assess them, treat them, and include them in research (Kilpatrick, 2013).

In contrast, the ICD-11 went the reverse way, defining PTSD in ICD-11 by a much smaller set of symptoms (WHO, 2018). PTSD requires the presence of three symptom clusters: re-experiencing, avoidance, and perceptions of heightened current threat. The members of the ICD-11 working group wanted to express the essential features of PTSD, and agreed that re-experiencing trauma, together with active avoidance and heightened sense of threat appeared to be the distinct factors of the disorder (Brewin, 2013). In addition, they emphasized the need for accessibility and thus easy applicability in non-English speaking countries with minimal resources, so that identification of people at risk will lead to more effective use of health services (WHO, 2018).

Interestingly, in the ICD-11 a precise definition of the trauma criterion was defined more globally and less strictly, which certainly has its advantages. After all, this decision equates PTSD with the other diagnostic categories in the DSM, most of which have no etiological factor in their criteria (Jongedijk et al., 2022). In addition, research showed that individuals who have experienced stressors that do not meet the trauma criterion according to the DSM may also develop PTSD (Robinson & Larson, 2010). However, the decision of the ICD-11 may have far-

reaching conceptual consequences. By easing the trauma criterion, the legitimacy of PTSD as a unique diagnosis after traumatic experiences is undermined. After all, there are many similarities between PTSD symptoms and symptoms of other disorders (Spitzer et al., 2007).

Because the narrow PTSD definition in ICD-11 was considered not to cover the full range of clinical symptoms in patients with a history of long-term interpersonal traumatization, the ICD-11 introduced a new 'complex PTSD' category. In addition to the PTSD-criteria, individuals with 'complex PTSD' must meet three additional symptom clusters: pervasive affective dysregulation, persistent negative self-concept, and persistent difficulties in sustaining relationships and in feeling close to others (WHO, 2018). 'Complex PTSD' defined in this way is less elaborate than 'DESNOS', more precisely defined compared to 'EPCACE', and with better distinction compared to personality disorders (Cloitre et al., 2014).

All in all, this means that there are significant differences between the two leading diagnostic classification systems: there are two definitions of PTSD and furthermore 'complex PTSD' is not included in DSM-5 while it is in ICD-11. Besides, 'ASD' is included in DSM-5 but not in ICD-11. But above all, the confusion of the two different definitions of PTSD is quite problematic due to possible differences in prevalence rates in studies and the fact that the two diagnostic systems tend to identify different individuals (Bryant, 2019). This situation may have disadvantageous effects in e.g., comparing research findings across studies, or in comparing the burden of trauma between countries that use different diagnostic systems (Schnurr, 2013). For patients and clinicians it may have the confusing consequence that choosing one system or another will have different impact on thresholds for treatment or for specific treatment options, but also on the assignment of pensions and insurance coverage (Carvajal, 2018; Hoge et al., 2016). Despite these negative consequences, it also offers scientific opportunities to search for new questions about defining the condition more precisely and to stimulate better diagnostic constructs (Carvajal, 2018; Schnurr, 2013).

2.4 DISCUSSION AND CHALLENGES FOR THE FUTURE

2.4.1. COMMON THREADS THROUGHOUT HISTORY

In this extensive historical literature review we pointed out recurring dilemmas and pitfalls in the field of psychotrauma. Our central questions were: how did post-traumatic symptoms and syndromes evolve and change over time, what are the causes of these changes, and why are scientists and clinicians still unable to create unity?

We showed that psychological disturbances after extreme adverse stressors have always been surrounded by disputes and controversy: throughout the decades there certainly was continuity and unity, but also a lot of disagreement, even to this day. Four main trends could be observed. First, the described symptomatology was always very varied, which regularly led to the debate that the symptom pattern consisted of too many and too different symptoms (Table 2). The current extended PTSD version in DSM-5 and the slimmed-down version in

ICD-11 still reflect this debate. Second, disputes arose over defining specific syndromes. This again reflected the issue which symptoms should be defined as post-traumatic and how they should be grouped, resulting in a proliferation of definitions and terminology (see Table 1). Third, the causal relationship between the events and the mental consequences was disputed. Heated discussions arose about the specific origin of the symptomatology. These discussions centred on whether there were physical or psychological causes, whether there was pre-trauma constitutional vulnerability or, whether there was physical weakness, lack of will-power, simulation, or malingering. Fourth, history has shown that there is a repeating pattern of temporal influences after each episode with traumatic events: societal, moral, political, juridical, and economic perspectives, as well as medical and psychological paradigms influenced the way psychotrauma symptoms and diagnoses were formulated. Some of these findings will be elaborated below.

Table 2.2. Posttraumatic symptoms and syndromes classified.

Syndrome classification	Primary symptoms *	Examples of related syndromes **
Acute Posttraumatic Stress Reactions	Anxiety and dissociation	Gross Stress Reaction; Acute Stress Disorder (DSM-IV)
Enduring Posttraumatic Stress Reactions	Physical: cardiac	Soldiers Heart; Irritable Heart Syndrome; Disordered Actions of the Heart
	Physical: neurological	Traumatic Hysteria; Railroad Spine; Shell Shock; Blast trauma
	Physical: fatigue / exhaustion	War-/ Traumatic Neurasthenia
	Psychic: anxiety and memory related intrusions	PTSD (DSM-III/ IV); PTSD (ICD-11)
	Psychic: including other mental symptoms	Nostalgia; Posttraumatic Embitterment Disorder; Posttraumatic Demoralization Disorder; Moral Injury; PTSD (DSM-5); Dissociative subtype of PTSD (DSM-5)
Complex Posttraumatic Stress Reactions	Interpersonal / personality-like disorders	Survivor Syndrome; Concentration camp Syndrome; DESNOS; Complex PTSD (ICD-11); EPCACE; Posttraumatic Self Disorder

Note: * Because of the often considerable overlap of symptoms, a debatable choice is sometimes made. ** This list is not complete but consists of some examples.

2.4.2. SYMPTOMS AND SYNDROMES: THEY COME AND GO

Over time, the described symptoms have changed significantly and there was a great variation in the descriptions of trauma related reactions. An important observation in this review is that a wide range of physical symptoms was described in great detail in almost every era, with symptoms of fatigue or heart diseases in some eras, and neurological signs or gastrointestinal complaints in others (Table 2). It is remarkable that most of these symptoms were not included in the original PTSD-criteria and got little attention thereafter.

Related to this, there has been much discussion in recent decades about whether psychological or physical factors play a role in psychotrauma complaints. These discussions took place, for example, with the train accidents and certainly with Oppenheim's traumatic neurosis. But also after the Second World War, when psychosomatic theories emerged and connections were made between living conditions, stress and physical illnesses (Bastiaans, 1957; Weiss & English, 1943). The discussion between soma and psyche continues to this day, for example with the concepts of 'blast trauma' and brain injury (Greer et al., 2018) resembling the earlier 'shell shock' discussions or with the recently re-cited old concept of the 'soldier's heart' and cardiological phenomena (Borges et al., 2020).

Whereas symptoms such as reliving the traumatic event were certainly reported throughout history, after the introduction of PTSD, memory-based theories dominated the psychotrauma literature. Symptoms that did not fit in here disappeared into the background, but later found a place again, albeit less prominently in, for example, DSM-5s PTSD and ICDs complex PTSD.

Looking at a syndrome level, many syndrome names have been put forth as listed in Table 1. However, we did find a reasonable agreement in history about three syndromes to be classified. First, there is an acute syndrome of short duration, with intense fear, horror and dissociative symptoms. Second, a syndrome with symptoms enduring for months until years, including various somatic symptoms, anxiety, reliving, hyperarousal, but also dissociation, and grief and mood symptoms. And third, a more complex symptom constellation was delineated, with features resembling personality changes. In essence, this classification into three forms of disorders is to some extent similar to current diagnostic entities called 'ASD', 'PTSD', and 'complex PTSD', respectively. However, it is important to note that there are significant differences in the various reported symptom constellations. In other words: despite the global similarities at syndrome level, the symptoms associated with the three distinct syndrome types varied considerably throughout history and were always subject to change over time. This means that concepts as 'soldiers heart', 'shell shock', 'traumatic neurosis', DSM-5s PTSD, or ICD-11s PTSD are defined differently and are *not* the same disorders (Table 2).

2.4.3. PTSD: A TIME-BOUND DISORDER?

In the controversy about PTSD as a validated diagnostic concept, contrasting points of view can be distinguished. These opposing views may explain many of the depicted disagreements about PTSD. One view is that PTSD is a clearly scientifically proven universal and timeless psycho-biological response to overwhelming traumatic stress. This is a frequent point of view in modern, especially western psychotraumatology (as described in e.g., Bracken, 2001; Figueira et al., 2007; McNally, 2004). In contrast, others criticized the PTSD concept, and question the scientific basis and even the raison d'être of PTSD (e.g., McHugh & Treisman, 2007; Rosen & Frueh, 2007; Rosen & Lilienfeld, 2008). In order to explain these differing viewpoints, important thoughts and analyses have been presented, especially from a historical perspective, on how PTSD is defined. These stem from for instance, historians themselves (e.g., Shepard, 2004), anthropologists (e.g., Young, 1995), philosophers (e.g., Hacking, 1994; Leys, 2010), sociologists

(e.g., Horwitz, 2018), and psychologists and psychiatrists (e.g., Bracken, 2001; McNally, 2004; Summerfield, 2001). In this section, we will limit ourselves to some key mechanisms that could explain the recurring diagnostic problems in trauma-related concepts.

In addition to the opposing views of PTSD as a universal, psychobiological, and timeless disorder versus a culture-bound, socially constructed one, a third option has been described: time-bound social contexts have a decisively influence on the manifestations of PTSD in an *interactive* way. In other words, reported symptoms are influenced by the classification process itself. In this way, symptoms become part of reality as both clinicians and patients shape them accordingly, as an interaction between psychobiology and socio-cultural contexts (Hacking, 1999; McNally, 2004).

Any particular period will have a predominant idea of what is considered a real disease. Presentations of especially mental illness vary during various time periods and draw on what Shorter (1993) called the 'symptom pool'. This term refers to how symptoms are represented in the culture's collective memory as belonging to a real illness. Symptoms of the symptom pool have been known throughout the ages, but their appearance fluctuates in frequency at different times. In some periods of history, certain symptoms are drawn from the pool, while in other periods they are barely visible. How these fluctuations come about has to do with what is considered legitimate symptoms for disease at any given time. Subsequently, experts and doctors will shape manifestations of diseases according to current medical knowledge and under the influence of the existing socio-cultural paradigm. Patients follow, as they will present legitimate symptoms associated with an expert-diagnosed disease. This mechanism of culturally shaped symptom pools could explain the changes in posttraumatic symptoms over time (Horwitz, 2018).

For instance, in the century of the industrial revolution, a widely accepted mechanistic mindset caused scientists, clinicians as well as patients to form symptoms that fit into the prevailing frame of reference. At that time, for example, symptoms of the heart were widely accepted ('irritable heart syndrome'). A little later, the same applied to fatigue complaints and exhaustion of the nerves ('neurasthenia'). From a mechanistic paradigm prevailing at the time, the pathogenic mechanism of 'neurasthenia' was believed to stem from a failing defence barrier of the brain to excessive external stimuli. The origins of the current PTSD-concept, however, are related to the emerging psychologization and individualization of western 20th century societies. Compassionate humanity towards those affected received more attention than before and subsequently received a prominent place in the PTSD concept: there was an explicit cause without personal weakness. But above all, psychological theories reflecting internal mental processes were applied to the PTSD concept, with symptoms explicitly connected to the 'traumatic event' (the etiology) and the 'traumatic memory' (the pathogenic mechanism) (Bracken, 2001; Frankel, 1994; Young, 2004, 2016).

The principles of the 'symptom pool' can be further substantiated when one considers that they apply not only to a historical point of view, but also to current global paradigms: studies in non-western traumatized patients report crucial differences from western populations in PTSD

symptoms, including relative salience of avoidance and especially somatic symptoms (Hinton & Lewis-Fernández, 2011).

Even in recent decades there have been shifts in the symptom pool of PTSD. The changes in the criteria from PTSD according to DSM-III/DSM-IV to those according to DSM-5 demonstrate this. PTSD was no longer categorized as a threat-based anxiety disorder and to further underline this, a new cluster of symptoms called 'negative alterations in cognitions and mood' was introduced. While re-experiencing symptoms still dominate the PTSD criteria, the DSM-5 added many other key symptoms, vastly expanding the variety of PTSD symptoms from the diverse historical 'symptom pool'. Perhaps a trend has started here, where the focus will shift from 'reliving' and the concept of 'traumatic memory' to yet others, for example depression, shame and guilt. Interesting is the recent focus on moral aspects of traumatic situations, termed 'moral injury' (Griffin et al., 2019). Moral aspects have always played a role in traumatic situations, but perhaps they come to the fore especially in these days because, more than in the past, humanity is seen as an important value.

In short, regardless of whether trauma-related disorders have an universal psychobiological basis, history shows that they have an interpretive superstructure that allows for ever-changing symptom manifestations (Horwitz, 2018). Consequently, this could explain the non-existence of a stable set of post-traumatic symptoms throughout history. Therefore, the current PTSD formulation can be seen as the next stage in an ever-changing pattern of responses to life-threatening situations (Jones & Wessely, 2007).

2.4.4. FOR THE FUTURE: TOWARDS MORE FLEXIBLE SYMPTOM PROFILES

One of the main findings from this historical review is the large heterogeneity in symptom and syndrome expressions described in posttraumatic stress syndromes, which has fluctuated over the centuries. These findings are not surprising: in our opinion, there is a substantial bias in thinking about serious adverse experiences leading to a specific symptom profile. Throughout history there was a search for a universal, timeless, single way to describe the mental response to an enormous range of adverse events, from single traumatic events like motor vehicle accidents to torture, concentration camps, or long-lasting abuse. This is likely impossible: the consequences of traumatic events depend on a broad range of factors like e.g., characteristics of the events itself, characteristics of those affected, the circumstances before, during and after the events, and certainly time-bound social, cultural and professional developments and paradigms. This knowledge should lead to the insight that the mental consequences of traumatic experiences will never be unambiguous and will always remain varied in expression. This creates a challenge to look for diagnostic models that are more flexible in defining the variety of changing symptom profiles.

Several diagnostic approaches haven been put forth in recent decades, some of which represent a whole new diagnostic angle. In these approaches, diagnostic classifications are being supplemented or replaced by specific symptom dimensions within or outside these diagnostic classes. Examples are the 'Hierarchical Taxonomy of Psychopathology' (HiTOP;

Kotov et al., 2017), the 'Quadripartite Model' (Watson, 2009), or the 'Research Domain Criteria' (RDoC; Cuthbert, 2015). An upcoming and challenging way of diagnostics is being worked out in the network approach. In this approach, symptoms are not reflective of an underlying latent construct but are related to and cause each other (Borsboom, 2017) and has also been studied in PTSD (Birkeland et al., 2020).

While these diagnostic models offer challenging, entirely new perspectives, research has not progressed far enough to provide these models with a sufficiently solid foundation. Therefore, here we formulate a proposal that is closer to the existing, categorical way of thinking. This means that, in our opinion, post-traumatic phenomena can be better described in a hybrid form, with dimensional information in addition to categorical information: a diagnostic model with both *subtyping* and *staging*.

The model of 'subtyping' of PTSD means that in addition to the core symptoms of PTSD, subtypes can be added to reflect the variation in symptomatology (Dalenberg et al., 2012). Subtypes give a more personalized representation of the diversity of posttraumatic symptoms and will allow more specific treatment targets. Due to the presumed dimensional nature of PTSD (Broman-Fulks et al., 2006), subtyping can add useful information. Although DSM-5 contains non-dimensional delayed and dissociative subtypes, several studies indicated important other subtypes such as on the dimension of internalizing versus externalizing symptomatology (Forbes et al., 2010), somatic comorbidity (McFarlane et al., 2017), subthreshold versus full PTSD (Morgan-López et al., 2020), symptom complexity (Cloitre, 2015), or symptom severity (Jongedijk et al., 2019). Severity in particular is an important dimension, as Broman-Fulks and colleagues (2006, p. 377) state: 'At a minimum, researchers should supplement the categorical diagnosis with dimensional measures of PTSD severity.'

A variant of subtyping is the approach of 'staging', a diagnostic model derived from diagnostic models in somatic diseases such as cancer and diabetes. Some authors argue that PTSD is viewed too much as a unitary entity without considering a longitudinal perspective that encompasses a series of stages in the progression of the disorder (McFarlane et al., 2017; Nijdam et al., 2022). They propose a model with, in short, four stages defined as: (0): Asymptomatic but at risk; (1a): Undifferentiated symptoms of mild anxiety and distress; (1b): Subsyndromal distress with some behavioral and functional decline; (2): First episode of full-threshold symptoms; (3): Persistent symptoms with ongoing impairment; and ultimately (4): Severe unremitting illness of increasing chronicity with substantial disability'. The last two stages in particular are characterized by a high degree of comorbidity, often blurring the boundaries between the different diagnostic DSM-classifications (Jongedijk et al., 2019).

While *subtyping* provides current information about the variety of posttraumatic symptomatology, *staging* provides a longitudinal perspective. We propose to combine both approaches to get a thorough and realistic picture of the patient's psychopathology. This would yield a more personalized diagnostic point of view. In addition, it offers scope for a more targeted treatment approach aimed at specific symptoms that are most burdensome for the individual patient (McFarlane et al., 2017; Schmidt, 2015).

In conclusion, our review of the phenomenological descriptions of posttraumatic disorders along the lines of history provides an important clinical message: clinicians have to consider a broadening view on the posttraumatic symptomatology they are faced with. In other words, diagnostic classification has not to be based on 'top-down' diagnostics, but be drawn by diagnostic formulations from a thorough 'bottom-up' assessment that reviews all diagnostic possibilities (McHugh & Treisman, 2007). A description of post-traumatic symptomatology according to a model of both 'staging' and 'subtyping' will help patients to find recognition of their mental conditions, to understand and rebuild their life histories, and to find more personalized treatment approaches. Ultimately, a more flexible diagnostic system may replace the unproductive search for a universal trauma reaction.

AUTHOR CONTRIBUTIONS

RJ: conceptualization, methodology, investigation, writing – original draft preparation
PB: writing – review and editing
JK: writing – review and editing
RK: writing – review and editing, methodology, supervision

REFERENCES

Adler, A. (1943). Neuropsychiatric complications in victims of Boston's Coconut Grove disaster. *Journal of the American Medical Association*, *123*(17), 1098-1101. doi:10.1001/jama.1943.02840520014004

American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders* (3rd edition). Washington, DC: Author.

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th edition). Washington, DC: Author.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Archibald, H. C., Long, D. M., Miller, C., & Tuddenham, R. D. (1962). Gross stress reaction in combat. A 15-year follow-up. *American Journal of Psychiatry*, *119*(4), 317-322. doi:10.1176/ajp.119.4.317

Archibald, H.C., & Tuddenham, R.D. (1965). Persistent stress reaction after combat: A 20-year follow-up. *Archives of General Psychiatry*, *12*(5), 475-481. doi:10.1001/archpsyc.1965.01720350043006

Bastiaans, J. (1957). *Psychosomatische gevolgen van onderdrukking en verzet. (Psychosomatic consequences of suppression and resistance)*. Amsterdam: Noord-Hollandsche Uitgevers Maatschappij.

Baeyer, W.R V., Häfner, H., & Kisker, K.P. (1964). Klinischer Teil. In: *Psychiatrie der Verfolgten* (pp. 116-368) (Clinical Part. In: *Psychiatry of the Persecuted*). Berlin, Heidelberg: Springer.

Beltran, R.O., & Silove, D. (1999). Expert opinions about the ICD-10 category of enduring personality change after catastrophic experience. *Comprehensive Psychiatry*, *40*(5), 396-403. doi:10.1016/S0010-440X(99)90147-5

Beltran, R.O., Llewellyn, G.M., & Silove, D. (2008). Clinicians' understanding of International Statistical Classification of Diseases and Related Health Problems, 10th Revision: F62.0 enduring personality change after catastrophic experience. *Comprehensive Psychiatry*, *49*(6), 593-602. doi:10.1016/j.comppsych.2008.04.006

Ben-Ezra, M. (2011), Traumatic reactions from antiquity to the 16th century: was there a common denominator? *Stress and Health, 27*(3), 223-240. doi:10.1002/smi.1338

Birkeland, M.S., Greene, T., & Spiller, T.R. (2020). The network approach to posttraumatic stress disorder: A systematic review. *European Journal of Psychotraumatology*, *11*(1), 1700614. doi:10.1080/20008198.2019.1700614

Birmes, P., Hatton, L., Brunet, A., & Schmitt, L. (2003). Early historical literature for post-traumatic symptomatology. *Stress and Health*, *19*(1), 17-26. doi:10.1002/smi.952

Birmes, P.J., Bui, E., Klein, R., Billard, J., Schmitt, L., Allenou, C., Job, N., & Arbus, C. (2010). Psychotraumatology in antiquity. *Stress and Health*, *26*(1), 21-31. doi:10.1002/smi.1251

Bogacz, T. (1989). War neurosis and cultural change in England, 1914-22: The work of the War Office Committee of Enquiry into 'shell-shock'. *Journal of Contemporary History*, *24*(2), 227-256. doi:10.1177/002200948902400203

Bonhoeffer, K. (1926). Beurteilung, Begutachtung und Rechtsprechung bei den Sogenannten Unfallneurosen (Assessment, expert opinion and case law in the so-called accident neuroses). *Deutsche Medizinische Wochenschrift*, *52*(05), 179-182.

Borges, G.P., Tonon, J.H., Zunini, P.A., Martins da Silva, A.S., Garcia, M.D., Azevedo-Marques Périco, C., Lima, D.R., Torales, J., Ventriglio, A., Bhugra, D, & Castaldelli-Maia, J.M. (2020). Soldier's heart: the forgotten circulatory neurasthenia–a systematic review. *International Review of Psychiatry*, *32*(5-6), 510-519. doi.10.1080/09540261.2020.1757925

Borsboom, D. (2017). A network theory of mental disorders. *World Psychiatry*, *16*(1), 5-13. doi.org/10.1002/wps.20375

Boulanger, G. (1990). A state of anarchy and a call to arms: The research and treatment of post-traumatic stress disorder. *Journal of Contemporary Psychotherapy 20*, 5-15. doi:10.1007/BF00946016

Bracken, P.J. (2001). Post-modernity and post-traumatic stress disorder. *Social Science & Medicine*, *53*(6), 733-743. doi:10.1016/S0277-9536(00)00385-3

Brende, J.P. (1983). A psychodynamic view of character pathology in Vietnam combat veterans. *Bulletin Menninger Clinic 47*, 189-216.

Brewin, C.R. (2013). 'I Wouldn't Start From Here'—An Alternative Perspective on PTSD From the ICD-11: Comment on Friedman (2013). *Journal of Traumatic Stress*, *26*(5), 557-559. doi:10.1002/jts.21843

Broman-Fulks, J.J., Ruggiero, K.J., Green, B.A., Kilpatrick, D.G., Danielson, C.K., Resnick, H.S., & Saunders, B.E. (2006). Taxometric investigation of PTSD: Data from two nationally representative samples. *Behavior Therapy*, *37*(4), 364-380. doi:10.1016/j.beth.2006.02.006

Bryant, R.A. (2019). Post-traumatic stress disorder: A state-of-the-art review of evidence and challenges. *World Psychiatry*, *18*(3), 259-269. doi:10.1002/wps.20656

Bryer, J.B., Nelson, B.A., Miller, J.B., & Krol, P.A. (1987). Childhood sexual and physical abuse as factors

in adult psychiatric illness. *The American Journal of Psychiatry, 144*(11), 1426–1430. doi:10.1176/ajp.144.11.1426

Burgess, A.W., & Holmstrom, L.L. (1974). Rape trauma syndrome. *American Journal of Psychiatry*, *131*(9), 981-986. doi:10.1176/ajp.131.9.981

Carvajal, C. (2018). Posttraumatic stress disorder as a diagnostic entity–clinical perspectives. *Dialogues in Clinical Neuroscience*, *20*(3), 161-168. doi:10.1002/jclp.22855

Ciccone, P. E., Burstein, A., & Greenstein, R.A. (1988). Differences among patients with PTSD. *American Journal of Psychiatry*, *145*(5), 655-a. doi:10.1176/ajp.145.5.655-a

Cloitre, M., Garvert, D. W., Weiss, B., Carlson, E.B., & Bryant, R.A. (2014). Distinguishing PTSD, complex PTSD, and borderline personality disorder: A latent class analysis. *European Journal of Psychotraumatology*, *5*(1), 25097. doi:10.3402/ejpt.v5.25097

Cloitre, M. (2015). The 'one size fits all' approach to trauma treatment: Should we be satisfied? *European Journal of Psychotraumatology*, *6*(1), 27344. doi.10.3402/ejpt.v6.27344

Cohen, E. A. (1981). The post-concentration camp syndrome: a disaster syndrome. *Science and Public Policy*, *8*(3), 239-246. doi.10.1093/spp/8.3.239

Crocq, M.A., & Crocq, L. (2000). From shell shock and war neurosis to posttraumatic stress disorder: A history of psychotraumatology. *Dialogues in Clinical Neuroscience*, *2*(1), 47–55. doi:10.31887/DCNS.2000.2.1

Cuthbert, B.N. (2015). Research Domain Criteria: toward future psychiatric nosologies. *Dialogues in Clinical Neuroscience*, *17*(1), 89. doi:10.31887/DCNS.2015.17.1

Dalenberg, C.J., Glaser, D., & Alhassoon, O.M. (2012). Statistical support for subtypes in posttraumatic stress disorder: The how and why of subtype analysis. *Depression and Anxiety, 29*, 671-678. doi:10.1002/da.21926

Daly, R. (1983). Samuel Pepys and posttraumatic stress disorder. *British Journal of Psychiatry, 143*, 64-68. doi:10.1192/bjp.143.1.64

De Wind, E. (1972). Persecution, aggression and therapy. *International Journal of Psycho-Analysis*, *53*, 173-177.

DiMauro, J., Carter, S., Folk, J.B., & Kashdan, T.B. (2014). A historical review of trauma-related diagnoses to reconsider the heterogeneity of PTSD. *Journal of Anxiety Disorders*, *28*(8), 774-786. doi:10.1016/j.janxdis.2014.09.002

Ehrenreich, J.H. (2003). Understanding PTSD: forgetting 'trauma'. *Analyses of Social Issues and Public Policy*, *3*(1), 15-28. doi:10.1111/j.1530-2415.2003.00012.x

Eitinger, L. (1961). Pathology of the concentration camp syndrome: Preliminary report. *Archives of General Psychiatry*, *5*(4), 371-379. doi:10.1001/archpsyc.1961.01710160051006

Ellis, P.S. (1984). The origins of the war neuroses. Part 1. *Journal of the Royal Naval Medical Service*, *70*, 168-177.

Engelbrecht, A., Burdett, H., Silva, M.J., Bhui, K., & Jones, E. (2018). The symptomatology of psychological trauma in the aftermath of war (1945–1980): UK army veterans, civilians and emergency responders. *Psychological Medicine*, 1-8. doi:10.1017/S0033291718001460

Ferrari, R. (2015). Writing narrative style literature review. *The European Medical Writers Association, 24*, 230-235. doi:10.1179/2047480615Z.000000000329

Figueira, I., Luz, M.D., Braga, R.J., Cabizuca, M., Coutinho, E., & Mendlowicz, M.V. (2007). The increasing internationalization of mainstream posttraumatic stress disorder research: A bibliometric study. *Journal of Traumatic Stress*, *20*(1), 89-95. doi:10.1002/jts.20183

Forbes, D., Elhai, J.D., Miller, M.W., & Creamer, M. (2010). Internalizing and externalizing classes in posttraumatic stress disorder: A latent class analysis. *Journal of Traumatic Stress, 23*(3), 340-349. doi:10.1002/jts.20526; 10.1002/jts.20526

Frankel, F. H. (1994). The concept of flashbacks in historical perspective. *International Journal of Clinical and Experimental Hypnosis*, *42*(4), 321-336. doi:10.1080/00207149408409362

Freud, S. (1955). Introduction to psycho-analysis and the war neuroses. In *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume XVII (1917-1919): An Infantile Neurosis and Other Works* (pp. 205-216). London: The Hogarth Press Ltd.

Friedman, M.J. (1981). Post-Vietnam syndrome: Recognition and management. *Psychosomatics*, *22*(11), 931-942. doi:10.1016/S0033-3182(81)73455-8

Friedman, M.J. (2013). Finalizing PTSD in DSM-5: Getting here from there and where to go next. *Journal of Traumatic Stress*, *26*(5), 548-556. doi:10.1002/jts.21840

Friedman, P. (1949). Some aspects of concentration camp psychology. *American Journal of Psychiatry, 105*, 601-605. doi:10.1176/ajp.105.8.601

Frueh, B.C., Elhai, J.D., & Acierno, R. (2010). The future of posttraumatic stress disorder in the DSM. *Psychological Injury and Law*, *3*(4), 260-270. doi:10.1007/s12207-010-9088-6

Galatzer-Levy, I.R., & Bryant, R.A. (2013). 636,120 ways to have posttraumatic stress disorder. *Perspectives on Psychological Science*, *8*(6), 651-662. doi.org/10.1177/1745691613504115

Gayford, J.J. (1975). Wife battering: A preliminary survey of 100 cases. *British Medical Journal*, *1*(5951), 194-197. doi:10.1136/bmj.1.5951.194

Gersons, B.P.R. & Carlier, I.V.E. (1992), Post-traumatic stress disorder: A history of a recent concept. *British Journal of Psychiatry 161*, 742-748. doi:10.1192/bjp.161.6.742

Goderez, B.I. (1987), The survivor syndrome: Massive psychic trauma and posttraumatic stress disorder. *Bulletin Menninger Clinic, 51*, 96-113.

Greer, N., Sayer, N., Koeller, E., Velasquez, T., & Wilt, T. J. (2018). Outcomes associated with blast versus nonblast-related traumatic brain injury in US military service members and veterans: a systematic review. *Journal of Head Trauma Rehabilitation*, *33*(2), 16-29. doi.10.1097/HTR.0000000000000304

Griffin, B. J., Purcell, N., Burkman, K., Litz, B. T., Bryan, C. J., Schmitz, M., Villierme, C., Walsh, J., & Maguen, S. (2019). Moral injury: An integrative review. *Journal of Traumatic Stress*, *32*(3), 350-362. doi:10.1002/jts.22362

Grinker, R.R., & Spiegel, J.P. (1945). *War neuroses.* Philadelphia: Blakiston.

Grob, G. N. (1991). Origins of DSM-I: A study in appearance and reality. *American Journal of Psychiatry*, *148*(4), 421-431. doi.10.1176/ajp.148.4.421

Hacking, I. (1994). Memoro-politics, trauma and the soul. *History of the Human Sciences*, *7*(2), 29-52.

Hacking, I. (1999). *The social construction of what?* Cambridge: Harvard University Press.

Herman, J., Russell, D., & Trocki, K. (1986). Long-term effects of incestuous abuse in childhood. *The American Journal of Psychiatry, 143*(10), 1293-1296. doi.org/10.1176/ajp.143.10.1293

Herman, J.L. (1992), Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress, 5*, 377-391. doi:10.1002/jts.2490050305

Hermann, K., & Thygesen, P. (1954). The KZ syndrome; sequels of starvation eight years later. *Ugeskrift for laeger*, *116*(22), 825-836.

Hesnard, A. (1914). Les troubles nerveux et psychiques consécutifs aux catastrophes navales. *Revue de Psychiatrie*, *18*, 139-151.

Hinton, D.E., & Lewis-Fernández, R. (2011). The cross-cultural validity of posttraumatic stress disorder: implications for DSM-5. *Depression and Anxiety*, *28*(9), 783-801.doi: 10.1002/da.20753.

Hoge, C.W., Yehuda, R., Castro, C.A., McFarlane, A.C., Vermetten, E., Jetly, R., Karestan C., Koenen, K.C., Greenberg, N, Shalev, A.Y., Rauch, S.A.M., Marmar, C.R., & Rothbaum, B.O. (2016). Unintended consequences of changing the definition of posttraumatic stress disorder in DSM-5: critique and call for action. *JAMA Psychiatry*, *73*(7), 750-752. doi:10.1001/jamapsychiatry.2016.0647

Holdorff, B. (2011). The fight for 'traumatic neurosis', 1889–1916: Hermann Oppenheim and his opponents in Berlin. *History of Psychiatry*, *22*(4), 465-476. doi:10.1177/0957154X10390495

Horowitz, M. J. (1976). *Stress response syndromes*. New York: Jason Aronson.

Horowitz, M.J. (1986). Stress-response syndromes: A review of posttraumatic and adjustment disorders. *Hospital and Community Psychiatry*, *37*(3), 241-249. doi:10.1176/ps.37.3.241

Horwitz, A. V. (2018). *PTSD: A short history*. Baltimore: John Hopkins University Press.

James, W. (1911). On some mental effects of the earthquake. In: W. James, *Memories and Studies*, pp. 207-226. New York: Longmans Green.

Jones, E., Fear, N.T., & Wessely, S. (2007). Shell shock and mild traumatic brain injury: A historical review. *American Journal of Psychiatry, 164*(11), 1641-1645. doi:10.1176/appi.ajp.2007.07071180

Jones, E., & Wessely, S. (2001). The origins of British military psychiatry before the First World War. *War & Society, 19*(2), 91-108. doi:10.1179/072924701791201512

Jones, E., & Wessely, S. (2007). A paradigm shift in the conceptualization of psychological trauma in the 20th century. *Journal of Anxiety Disorders, 21*, 164-175. doi:10.1016/j.janxdis.2006.09.009

Jongedijk R.A., Carlier I.V.E., Schreuder B.J.N., & Gersons B.P.R. (1996). Complex posttraumatic stress disorder: An exploratory investigation of PTSD and DESNOS among Dutch war veterans. *Journal of Traumatic Stress, 9,* 577-586. doi:10.1007/BF02103666

Jongedijk, R.A., Van der Aa, N., Haagen, J.F., Boelen, P.A., & Kleber, R.J. (2019). Symptom severity in PTSD and comorbid psychopathology: A latent profile analysis among traumatized veterans. *Journal of Anxiety Disorders*, *62*, 35-44. doi:10.1016/j.janxdis.2018.11.004

Jongedijk, R. A., Van Vreeswijk, M. F., Knipscheer, J. W., Kleber, R. J., & Boelen, P. A. (2022). The Relevance of Trauma and Re-experiencing in PTSD, Mood, and Anxiety Disorders. *Journal of Loss and Trauma, 28*(4), 404–420. doi:10.1080/15325024.2022.2116782.

Kardiner A. (1941). *The traumatic neuroses of war*. New York: Paul Hoeber.

Kardiner, A. (1959). Traumatic neuroses of war, p. 245-257. In: S. Arieti (ed.), *American Handbook of Psychiatry*. New York: Basic Books.

Kilpatrick, D. G. (2013). The DSM-5 got PTSD right: Comment on Friedman (2013). *Journal of Traumatic Stress, 26*(5), 563–566. doi:10.1002/jts.21844.

Kinzie, J.D., & Goetz, R.R. (1996). A century of controversy surrounding posttraumatic stress-spectrum syndromes: The impact on DSM-III and DSM-IV.

Journal of Traumatic Stress, 9, 159-179. doi:10.1002/jts.2490090202

Kloocke, R., Schmiedebach, H.P., & Priebe, S. (2005). Psychological injury in the two world wars: changing concepts and terms in German psychiatry. *History of Psychiatry*, *16*(1), 43-60. doi:10.1177/0957154X05044600

Krystal, H., & Niederland, W. (1968). Clinical observations on the survivor syndrome. In: H. Krystal (ed.), *Massive Psychic Trauma* (pp. 327-348). New York: International Universities Press.

Kolb, L.C. (1989), Heterogeneity of PTSD. *American Journal of Psychiatry 146*, 811-812. doi:10.1176/ajp.146.6.811-a

Kotov, R., Krueger, R.F., Watson, D., Achenbach, T.M., Althoff, R.R., Bagby, R.M., Brown, T.A., Carpenter, W.T., Caspi, A., Clark, L.A., Eaton, N.R., Forbes, M.K., Forbush, K.T., Goldberg, D., Hasin, D., Hyman, S.E., Ivanova, M.Y., Lynam, D.R., Markon, K., . . . Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology, 126*(4), 454–477. doi:10.1037/abn0000258

Lerer, B. (1988). Differences among patients with PTSD-reply. *American Journal of Psychiatry, 145*(5), 656-656.

Lerner, P. F. (2003). *Hysterical men: War, psychiatry, and the politics of trauma in Germany, 1890-1930*. Ithaca, London: Cornell University Press.

Leys, R. (2010). *Trauma: A genealogy*. Chicago: University of Chicago Press.

Lindy, J.D., & Titchener, J. (1983), Acts of God and Man: Long-term Character Change in survivors of disasters and the law. *Behavioral Sciences Law, 1*, 85-96. doi:10.1002/bsl.2370010309

Luxenberg, T., Spinazzola, J., & Van der Kolk, B.A. (2001). Complex trauma and disorders of extreme stress (DESNOS) diagnosis, part one: Assessment. *Directions in Psychiatry, 21*(25), 373-392.

Maercker, A., & Perkonigg, A. (2013). Applying an international perspective in defining PTSD and related disorders: comment on Friedman (2013). *Journal of Traumatic Stress*, *26*(5), 560-562. doi.org/10.1002/jts.21852

Malt, UF., Schnyder, U., & Weisaeth, L. (1996). ICD-10 Mental and behavioral consequences of traumatic stress. *International Review of Psychiatry*, *2*, 151-176.

Marshall, R. D., Spitzer, R., & Liebowitz, M.R. (1999). Review and critique of the new DSM-IV diagnosis of acute stress disorder. *American Journal of Psychiatry*, *156*(11), 1677-1685.

McFarlane, A.C., Lawrence-Wood, E., Van Hooff, M., Malhi, G.S., & Yehuda, R. (2017). The need to take a staging approach to the biological mechanisms of PTSD and its treatment. *Current Psychiatry Reports*, *19*(2), 10. doi:10.1007/s11920-017-0761-2

McHugh, P.R., & Treisman, G. (2007). PTSD: A problematic diagnostic category. *Journal of Anxiety Disorders*, *21*(2), 211-222. doi:10.1016/j.janxdis.2006.09.003

McNally, R. J. (2004). Conceptual problems with the DSM-IV criteria for posttraumatic stress disorder. In: G.M. Rosen (ed), *Posttraumatic stress disorder: Issues and controversies* (pp. 1-14). Hoboken: John Wiley & Sons Ltd.

Micale, M.S. (1990). Charcot and the idea of hysteria in the male: Gender, mental science, and medical diagnosis in late nineteenth-century France. *Medical History*, *34*(4), 363-411. doi:10.1017/S0025727300052777

Morgan-López, A. A., Killeen, T. K., Saavedra, L. M., Hien, D. A., Fitzpatrick, S., Ruglass, L. M., & Back, S. E. (2020). Crossover between diagnostic and empirical categorizations of full and subthreshold PTSD. *Journal of Affective Disorders, 274*, 832–840. doi:10.1016/j.jad.2020.05.031.

Mosse, G.L. (2000). Shell-shock as a social disease. *Journal of Contemporary History, 35*(1), 101-108. doi:10.1177/002200940003500109

Myers, C. (1915). A contribution to the study of shell shock.: Being an account of three cases of loss of memory, vision, smell, and taste, admitted into the Duchess of Westminster's War Hospital, Le Touquet. *The Lancet*, *185*(4772), 316-320.

Newman, E., Orsillo, S., Herman, D., Niles, B., Litz, B. (1995). Clinical presentation of disorders of extreme stress in combat veterans. *Journal of Nervous and Mental Disease, 183*, 664-668. doi:10.1097/00005053-199510000-00003

Niederland, W.G. (1968), Clinical observations on the survivor syndrome. *International Journal of Psychoanalysis 49*, 313-315.

Niederland, W.G. (1981). The survivor syndrome: Further observations and dimensions. *Journal of the American Psychoanalytic Association*, *29*(2), 413-425. doi:10.1177/000306518102900207

Nijdam, M. J., Vermetten, E., & McFarlane, A. C. (2022). Towards Staging Differentiation for PTSD Treatment. *Acta Psychiatrica Scandinavica*. doi.10.1111/acps.13520

Norris, F.H., Friedman, M.J., Watson, P.J., Byrne, C.M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry*, *65*(3), 207-239. doi:10.1521/psyc.65.3.207.20173

Parry-Jones, B., & Parry-Jones, W. L. (1994). Post-traumatic stress disorder: supportive evidence from an eighteenth century natural disaster. *Psychological Medicine, 23*(1), 15–27. doi:10.1017/S0033291700026799.

Parson, E.R. (1984), The reparation of the self: clinical and theoretical dimensions in the treatment of Vietnam combat veterans. *Journal of Contemporary Psychotherapy 14*, 4-56. doi:10.1007/BF00956735

Parson, E.R. (1990), Post-traumatic Demoralization syndrome (PTDS). *Journal of Contemporary Psychotherapy 20*, 17-33. doi:10.1007/BF00946017

Peters, L., Slade, T., & Andrews, G. (1999). A comparison of ICD10 and DSM-IV criteria for posttraumatic stress disorder. *Journal of Traumatic Stress*, *12*(2), 335-343. doi.org/10.1023/A:1024732727414

Ray, S.L. (2008). Evolution of Posttraumatic Stress Disorder and Future Directions. *Archives of Psychiatric Nursing 22*(4), 217-225. doi:10.1016/j.apnu.2007.08.005

Robinson, J.S., & Larson, C. (2010). Are traumatic events necessary to elicit symptoms of posttraumatic stress? *Psychological Trauma: Theory, Research, Practice, and Policy*, *2*(2), 71. doi:10.1037/a0018954

Rollin, H. (1990). 'Traumatic neuroses'. *British Journal of Psychiatry, 157*(6), 939-939. doi:10.1192/S0007125000047711

Rosen, G. (1975). Nostalgia: a 'forgotten' psychological disorder. *Psychological Medicine*, *5*(4), 340-354. doi:10.1163/9789004418226_003

Rosen, G.M. & Frueh, B.C. (2007). Challenges to the PTSD construct and its database: The importance of scientific debate. *Journal of Anxiety Disorders, 21*, 2, 161-163. doi:10.1016/j.janxdis.2006.09.007

Rosen, G.M., & Lilienfeld, S.O. (2008). Posttraumatic stress disorder: An empirical evaluation of core assumptions. *Clinical Psychology Review*, *28*(5), 837-868. doi:10.1016/j.cpr.2007.12.002

Rosenheck, R. (1985), Malignant post-Vietnam syndrome. *American Journal of Orthopsychiatry 55*, 166-176. doi:10.1111/j.1939-0025.1985.tb03430.x

Roth, S., Newman, E., Pelcovitz, D., Van Der Kolk, B., & Mandel, F.S. (1997). Complex PTSD in victims exposed to sexual and physical abuse: Results from the DSM-IV field trial for posttraumatic stress disorder. *Journal of Traumatic Stress*, *10*(4), 539-555. doi:10.1023/A:1024837617768

Schmiedebach, H.P. (1999). Post-traumatic neurosis in nineteenth-century Germany: a disease in political, juridical and professional context. *History of Psychiatry*, *10*(37), 027-57. doi:10.1177/0957154X9901003703

Schmidt, U. (2015). A plea for symptom-based research in psychiatry. *European Journal of Psychotraumatology*, *6*(1), 27660. doi:10.3402/ejpt.v6.27660

Schnurr, P.P. (2013). The changed face of PTSD diagnosis. *Journal of Traumatic Stress*, *26*(5), 535-536. doi:10.1002/jts.21843

Scott, W.J. (1990). PTSD in DSM-III: A case in the politics of diagnosis and disease. *Social Problems*, *37*(3), 294-310. doi:10.2307/800744

Shatan, C.F. (1973). The grief of soldiers: Vietnam combat veterans' self-help movement. *American Journal of Orthopsychiatry*, *43*(4), 640. doi:10.1111/j.1939-0025.1973.tb00834.x

Shepard, B. (2004). Risk factors and PTSD: a historian perspective. In: G.M. Rosen (ed), *Posttraumatic stress disorder: Issues and controversies* (pp. 39-61). Hoboken: John Wiley & Sons Ltd.

Shorter, E. (1993). *From paralysis to fatigue. A history of psychosomatic illness in the modern era*. New York: The Free Press.

Shorter, E. (2022). The history of nosology and the rise of the Diagnostic and Statistical Manual of Mental Disorders. *Dialogues in Clinical Neuroscience*. doi.10.31887/DCNS.2015.17.1/eshorter

Spitzer, R.L., First, M.B., & Wakefield, J.C. (2007). Saving PTSD from itself in DSM-V. *Journal of Anxiety Disorders*, *21*(2), 233-241. doi.10.1016/j.janxdis.2006.09.006

Stierlin, E. (1911). Nervöse und psychische Störungen nach Katastrophen. *Deutsche Medizinische Wochenschrift, 37*(44), 2028-2035. doi:10.1055/s-0028-1131060

Summerfield, D. (2001). The invention of post-traumatic stress disorder and the social usefulness of a psychiatric category. *BMJ: British Medical Journal*, *322*(7278), 95-98. doi:10.1136/bmj.322.7278.95

Swank, R.L. (1949). Combat exhaustion: A descriptive and statistical analysis of causes, symptoms and signs. *Journal of Nervous and Mental Disease, 109*, 475-508. doi:10.1097/00005053-194910960-00001

Terr. L.C. (1991). Childhood traumas: an outline and overview. *American Journal of Psychiatry*, *148*, 10-20. doi:10.1176/ajp.148.1.10

Titchener, J.L. & Kapp, F.T. (1976), Family and character change at Buffalo Creek. *American Journal of Psychiatry, 133*, 295-299. doi:10.1176/ajp.133.3.295

Turnbull, G.J. (1998). A review of post-traumatic stress disorder. Part I: Historical development and classification. *Injury*, *29*(2), 87-91. doi:10.1016/S0020-1383(97)00131-9

Van der Hart, O. & Horst, R. (1989). The dissociation theory of Pierre Janet. *Journal of Traumatic Stress*, *2*(4), 397-412. doi:10.1002/jts.2490020405

Van der Hart, O. & Brown, P. (1990). Concept of Psychological Trauma. *American Journal of Psychiatry, 147*, 12, 1691.

Van der Kolk, B.A. & Van der Hart, O. (1989). Pierre Janet and the breakdown of adaptation. *American Journal of Psychiatry, 146*, 1530-1540. doi:10.1176/ajp.146.12.1530

Van der Kolk, B.A., Roth, S., Pelcovitz, D., Sunday, S., & Spinazzola, J. (2005). Disorders of extreme stress: The empirical foundation of a complex adaptation to trauma. *Journal of Traumatic Stress*, *18*(5), 389-

399. doi:10.1002/jts.20047

Venzlaff, U. (1964). Mental disorders resulting from racial persecution outside of concentration camps. *International Journal of Social Psychiatry*, *10*(3), 177-183. doi.org/10.1177/002076406401000303

Veissière, S. (2021). Is Complex PTSD a Valid Diagnosis? *Psychology Today*. www.psychologytoday.com/us/blog/culture-mind-and-brain/202104/is-complex-ptsd-valid-diagnosis

Walker, L.E. (1977). Battered women and learned helplessness. *Victimology*, *2*(3-4), 525–534.

Watson, D. (2009). Differentiating the mood and anxiety disorders: A quadripartite model. *Annual Review of Clinical Psychology*, *5*, 221-247. doi:10.1146/annurev.clinpsy.032408.153510

Weiss, E. & English, O.S. (1943). *Psychosomatic Medicine*. Philadelphia: W. B. Saunders Company.

Weisaeth, L. The European history of psychotraumatology. *Journal of Traumatic Stress, 15,* 6, 2002, 443-452. doi:10.1023/A:1020909620364

WHO (1993). *The ICD-10 Classification of Mental and Behavioural Disorders: Diagnostic Criteria for Research*. Geneva: World Health Organization.

WHO (2018). *International Classification of Diseases for Mortality and Morbidity Statistics* (11th Revision). https://icd.who.int/browse11/l-m/en

Wiltshire, H. (1916). A contribution to the etiology of Shell Shock. *The Lancet*, *187*(4842), 1207-1212. doi:10.1016/S0140-6736(01)14500-9

Young, A. (1995). *The harmony of illusions. Inventing posttraumatic stress disorder*. Princeton, NJ: Princeton University Press.

Young, A. (2004). When traumatic memory was a problem: On the historical antecedents of PTSD. In G.M. Rosen (ed), *Posttraumatic stress disorder: Issues and controversies* (pp. 127-146). Hoboken: John Wiley & Sons Ltd.

Young, A. (2016). Culture, history and traumatic memory: an interpretation. *Acta Bioethica*, *22*(1), 63-70.

Zlotnick, C., Zakriski, A.L., Shea, M. T., Costello, E., Begin, A., Pearlstein, T., & Simpson, E. (1996). The long-term sequelae of sexual abuse: Support for a complex posttraumatic stress disorder. *Journal of Traumatic Stress*, *9*(2), 195-205. doi:10.1007/BF02110655

'*By making reference to trauma or stressors only in one dedicated chapter, the DSM-5 implies that other diagnostic categories are unrelated to trauma.*' [8]

8 Retrieved from p. 19: Allsopp, K., Read, J., Corcoran, R., & Kinderman, P. (2019). Heterogeneity in psychiatric diagnostic classification. *Psychiatry Research*, *279*, 15-22.

The relevance of trauma and re-experiencing in PTSD, mood, and anxiety disorders

Published as:
Jongedijk, R. A., van Vreeswijk, M. F., Knipscheer, J. W., Kleber, R. J., & Boelen, P. A. (2022). The Relevance of Trauma and Re-experiencing in PTSD, mood, and anxiety disorders. *Journal of Loss and Trauma, 28*, 4, 404–420. https://doi/10.1080/15325024.2022.2116782

3

ABSTRACT

How traumatic events (TEs) should be defined, and how specific TEs are for the Posttraumatic Stress Disorder (PTSD) was examined in a general mental health care population. Three definitions of TEs were defined, according to the PTSD criteria of DSM-IV. Half of the sample reported any TE, with a high prevalence of TEs among non-PTSD disorders. Previous mental health care, female gender, and the likelihood of assigning PTSD were associated with more severe trauma definitions. Re-experiencing symptoms were especially common among mood disorders. The implications for treatment are discussed and an alternative, dimensional definition of trauma has been proposed.

KEY WORDS
Traumatic event, traumatic stress, posttraumatic stress disorder, mood disorder; intrusion

3.1 INTRODUCTION

The original assumption underlying the formulation of the Post Traumatic Stress Disorder (PTSD) in DSM-III (APA, 1980) was the central role of exposure to a traumatic event (TE; Criterion A) as the presumptive primary etiological factor. Since TEs are still mandatory for diagnosing PTSD in DSM-5 (APA, 2013), a clear definition of this criterion is crucial to reliably diagnose this disorder, but it is also one of the most challenging and controversial aspects of PTSD. (Brewin et al., 2009; Stein et al., 2016). Two major points of dispute about Criterion A are pointed out here.

A first key point of debate is how TEs should be defined. Stressor severity can be placed on a continuum, ranging from daily hassles to severe and/or catastrophic events (Breslau & Kessler, 2001; Liu et al., 2017; Weathers & Keane, 2007). There is general agreement that high impact events like combat, torture, and sexual violence fall under Criterion A. Controversy rises about the relatively less severe adverse life events such as unexpected death of a family member, marital disruption, employment-related stressors, and about the impact of indirectly experiencing a TE (Frueh et al., 2010).

The DSM-III definition of Criterion A ('The existence of a recognizable stressor that would evoke significant symptoms of distress in almost everyone'; APA, 1980, p. 238) was criticized as being too vague, broad, and subjective (Weathers & Keane, 2007). Therefore, in DSM-IV the criterion was tightened and divided in two sub-criteria (APA, 1994). Criterion A1 (A1) specified the type and nature of the events: the person must have experienced, or was confronted with an event that involved actual or threatened death, serious injury, or physical integrity of self or others; or the person was learning about these events experienced by a family member or other close associate. To stress the impact of the event, Criterion A2 (A2) was added: 'the person's response involved intense fear, helplessness, or horror' (APA, 1994, p. 427).

Regarding A2, several advantages have been described: A2 would strengthen the validity of the definition of a traumatic event and would also play a gatekeeper role in defining traumatic events by distinguishing the so-called real traumatic events from a variety of other less distressing events (Armour et al., 2011). In addition, A2 would be of added value because, as some authors have argued, not only the type of event, but also the response to the event is a significant risk factor for psychological distress (Cameron et al., 2010). However, several important points of criticism were made. A conceptual criticism was that A2 is an emotional response and not a defining feature of the event itself. Second, the reliability of A2 was questioned because patients have to tell in retrospect about their feelings during the traumatic event (O'Donnell et al., 2010). Third, the lack of predictive utility of A2 in diagnosing PTSD was depicted (Friedman et al., 2011). Last, findings indicated that some populations, such as military or police officers trained not to feel emotions or victims of sexual abuse who dissociated during the TE, reported no emotional response (Adler et al., 2008; Friedman, 2013), or reported symptoms not belonging to A2 such as worrying or physical symptoms (O'Donnel et al., 2010). In DSM-5, A2 was abolished while the definition of the events in Criterion A was

newly defined, namely 'exposure to actual or threatened death, serious injury, or sexual violence' in ways like for instance, 'directly experiencing the traumatic event(s)' or 'witnessing, in person, the event(s) as it occurred to others' (APA, 2013, p. 271).

A second key point in the debate about criterion A concerned the unclear relationship between TEs and PTSD. In short, only a minority of people who experienced TEs have been found to develop PTSD (Knipscheer et al., 2020; Liu et al, 2017) while people may even develop PTSD symptoms without experiencing an event that meets the definition of Criterion A (Bodkin et al., 2007; Gold et al., 2005; Long et al., 2008; Robinson & Larson, 2010). Furthermore, there is evidence that not only PTSD but also a range of other mental disorders is associated with TEs (Kuzminskaite et al., 2022; Laugharne et al., 2010).

Defining Criterion A is of importance because it has serious implications for diagnosing PTSD (as defined in the DSM) as well as the identification of (alleged) trauma victims, allocation of resources for them, indication to specific treatment approaches, and trauma-related research (Long et al., 2008).

The current study was designed to address the described issues about the trauma criterion. Since the definition of the stressor criterion according to DSM-IV consists of two steps, namely Criteria A1 and A2, the use of this definition in particular had an important advantage in studying the influence of the trauma definition on prevalence and possible mental consequences. Whereas most studies investigating the trauma criterion were performed in general community samples or in samples of traumatized patients, this study was conducted in a heterogeneous sample of treatment-seeking general outpatients with mental health complaints. This has the advantage of investigating TEs in a broader spectrum of psychopathology and in a population of patients most mental health clinicians encounter in daily practice.

The first objective was to investigate the impact of how the traumatic stressor criterion is defined by establishing the prevalence of TEs in our sample according to three definitions. For this purpose, the diagnostic process described by Weathers and Keane (2007, p.116) was followed: 'The diagnostic criteria for PTSD consist of a series of accumulating requirements that create an increasingly specific diagnostic rule for the diagnosis.' They stated that PTSD according to DSM-IV is defined by a broad Criterion A1, a constraining Criterion A2 and then the other PTSD Criteria B-F. The definitions of the TEs used in this study are largely consistent with this reasoning, but in the third of our three definitions only Criterion B (re-experiencing symptoms) was included, because re-experiencing is often seen as a very recognizable and disabling trauma related PTSD symptom. Accordingly, in this study, a traumatic stressor was defined in the following ways: TEs as described in Criterion A1 (named here: *TE-A1*), events having a mental impact during or shortly after the event as described in Criterion A2 (full Criterion A, named: *TE-A*), and finally events that continued to have an impact long after the event, operationalized by the presence of re-experiences as described in Criterion B (full Criteria A plus B, named: *TE-AB*).

Due to the assumed gatekeeper role of A2, TE-A1 would be expected to have a higher prevalence than TE-A and because not everyone develops post-traumatic symptoms after TEs,

TE-AB would have the lowest prevalence. In addition, we explored if people who experienced TE-A1, TE-A, or TE-AB differed in terms of sociodemographic variables (i.e., gender, marital status, and previous mental health care usage). Since experiencing a traumatic event is associated with impaired socioeconomic functioning (e.g., Mock & Arai, 2011), we hypothesized that, first, patients with higher use of previous mental health services and second, with life without a partner reported more high impact TEs. Furthermore, we hypothesized that female patients reported more high impact TEs than male patients (Olff, 2017).

The next objective was to investigate the relationship between the TE definitions and mental disorders in order to examine the specificity of the TEs for the disorders in question. As TEs and re-experiencing symptoms are common in mood and to a lesser extent in anxiety disorders (Bryant et al., 2011; Payne, Kralj, Young & Meiser-Stedman, 2019), it was hypothesized that TE-ABs (TEs and re-experiencing symptoms) were most common in PTSD and next, more common in mood disorders than in anxiety disorders.

3.2 METHOD

3.2.1. PARTICIPANTS AND PROCEDURE

Participants were all newly referred patients (N= 422) during a 10 months period who were admitted to a mental health outpatient clinic, part of a large general hospital in the Netherlands[9]. This general outpatient clinic was only accessible to patients between 18 and 65 years of age, mainly with a wide range of anxiety and mood disorders. Patients with chronic severe mental illness (SMI) like psychosis were referred elsewhere.

The study has a naturalistic design and, as such, cohered closely with clinical practice. A short, standardized structured interview, the Three Step Trauma Interview (TSTI), designed by the first two authors, was administered to specify the trauma criterion according to the three categories TE-A1, TE-A, and TE-AB (Figure 3.1). Additional assessments were based on the clinical judgement of two experienced clinicians: all patients were assessed and interviewed by a clinical psychologist and a psychiatrist and, then, diagnostic conclusions were discussed. Together, they came to a diagnostic classification according to DSM-IV.

Data were archived anonymously. Patients were informed about the storage of the anonymized assessment data. Because assessments did not put a burden on patients, were part of the regular intake assessment, and were archived anonymously, no review of ethical merits of this study was needed.

3.2.2. MEASURES

Besides the routine intake assessment, the prevalence of TEs according to three different definitions was registered by means of the TSTI (Figure 3.1). As mentioned, the TSTI is based

9 Reinier de Graaf Gasthuis, Delft, The Netherlands

on the diagnostic process described by Weathers and Keane (2007). Defining the TEs in these three steps was a way of assessing the impact of the traumatic event.

Before starting the TSTI, the interviewer explained the definition of a TE according to the description in the SCID Axis I diagnostic assessment in the following way: 'Sometimes things happen to people that are extremely upsetting; things like being in a life threatening situation, a major disaster, very serious accident of fire; being physically assaulted or raped, seeing another person killed or dead, or badly hurt, or hearing about something horrible that has happened to someone you are close to. We call this traumatic events' (Peirce et al., 2009, p.4). Then, the interviewer followed the TSTI. In the first step, patients were asked about A1 (*lifetime*) according to the DSM-IV. Then, as a second step, patients were asked for the distress reactions according to Criterion A2 of DSM-IV, namely intense fear, feelings of helplessness, or feelings of horror during or shortly after the event. In the third step, patients were asked about re-experiencing symptoms according to Criterion B of DSM-IV (*within the last month*).

Other information was obtained through careful clinical examination by the same two assessors (see Paragraph 3.2.1). All axis I DSM-IV diagnoses were recorded (*last month*). The interviewers also registered age, gender, marital status, and the use of previous mental health care services.

Figure 3.1. The Three Step Trauma Interview (TSTI).

Question 1.

Have you ever, at any time in your life, experienced, witnessed, or were you confronted with such a traumatic event that involved actual or threatened death or serious injury, or a threat to the physical integrity of yourself or others?

YES*: go to Q2*

NO → stop. ***Fulfilling no TE Category***

Question 2.

Did the response to these experiences during or directly after the traumatic event involved one or more of these reactions:

intense fear or # feelings of helplessness or # feelings of horror

YES: *go to Q3*

NO → stop. ***Fulfilling TE-A1***

Question 3.

Did you re-experience the event(s) in the last month in a disturbing manner? For instance in dreams / nightmares, flashbacks, intense remembering, or physical reactions

YES → ***Fulfilling TE-AB***

NO → ***Fulfilling TE-A***

3.2.3. STATISTICAL ANALYSIS

The results of the TSI, sociodemographics, and all DSM-IV axis I diagnoses were recorded. Patients were categorized on the basis of their principal disorders. Because many disorders were too rare, only the participants with anxiety and mood disorders were included and grouped according to the following clusters: all unipolar depressive disorders including dysthymia were called Unipolar Mood Disorders (UMD); patients with comorbid PTSD were excluded. Those with any anxiety disorder excluding PTSD were called Anxiety Disorders (AnxD). PTSD was defined as a separate group.

To test all hypotheses, Pearson Chi-Square tests were used (α level <0.05). IBM SPSS for Windows 27 was used to perform the statistical analyses.

3.3 RESULTS

3.3.1. PREVALENCE OF TRAUMATIC EVENT TYPES

422 Patients referred to the clinic were included. 60% were female and 40% male. Mean age was 36.7 years (SD = 12.3). Half of the patients reported one or more TEs (Table 3.1).

The first hypothesis was that TE-A1 had a higher prevalence than TE-A, and TE-AB had the lowest prevalence. Indeed, as shown in Table 3.1 (middle column), half of all patients of the sample reported any TE, 28.9% reported only a TE according to Criterion A1, 21.2% reported a TE with A1 plus A2 during their lifetime, and 11.3% reported A1, A2, plus B. Of the 21.1% of patients reporting an A1 plus A2, 9.9% reported *only* A1 plus A2 and 11.3% reported also re-experiencing symptoms (Criterion B). In the subsample of patients who reported any traumatic event (third column, Table 3.1), 43.3% reported the full Criterion A (A1 plus A2) and 22.6% reported re-experiencing symptoms in the past month.

Table 3.1. Prevalence of reported trauma definitions according to the TSTI.

	In total sample (%/N) (N= 415)	In sample with any TE (N/%) (N= 208)
No traumatic event	49.9% (207)	---
Any traumatic event	50.1% (208)	100% (208)
- Patients with only A1	28.9% (120)	57.7% (120)
- Patients with A1 plus A2	21.2% (88)	42.3% (88)
--- of these: with *only* A1 + A2	9.9% (41)	19.7% (41)
--- of these: with A1, A2, *plus* B	11.3% (47)	22.6% (47)

Note: TSTI= Three Step Trauma Interview; TE= Traumatic Event; A1= TE according to PTSD Criterion A1; A2= according to Criterion A2; B= according to Criterion B. All according to DSM-IV.

3.3.2. SOCIODEMOGRAPHICS AND TEs

When looking at the association with sociodemographic factors, a chi-square analysis revealed significant differences regarding previous health care consumption: patients reporting more severe defined TE categories were more likely to have had previous mental health care, χ^2 (3, n= 404) = 9.79, p < .05. No significant difference was found between the TE definitions concerning marital status. Consistent with our third socio-demographic hypothesis, female patients reported more TEs and significantly more severe TEs compared to male patients, χ^2 (3, n= 414) = 15.58, p < .001 (Table 3.2).

Table 3.2. Sociodemographic variables and impact of TE definition.

	No TE	TE-A1	TE-A	TE-AB
Gender (N=414)				
Male: 166 (40%)	102 (61.4%)	39 (23.5%)	11 (6.6%)	14 (8.4%)
Female: 248 (60%)	104 (41.9%)	81 (32.7%)	30 (12.1%)	33 (13.3%)
Marital status (N=404)				
Married: 133 (32.9%)	74 (55.6%)	32 (24.1%)	11 (8.3%)	16 (12%)
Never married: 204 (50.5%)	105 (51.4%)	61 (29.9%)	20 (9.8%)	18 (8.8%)
Divorced: 59 (14.6%)	22 (37.3%)	20 (33.9%)	8 (13.68%)	9 (15.2%)
Widowed: 8 (2%)	2 (25%)	4 (50%)	2 (25%)	0
Previous Mental Health Care (N=404)				
No: 275 (68%)	147 (53.5%)	82 (29.8%)	24 (8.7%)	22 (8%)
Yes: 129 (31.9%)	56 (43.4%)	35 (27.1%)	16 (12.4%)	22 (17%)

Note: TE= Traumatic Event; TE-A1= TE according to PTSD Criterion A1; TE-A= Criteria A1+A2; TE-AB= Criteria A1+A2+B. All according to DSM-IV.

3.3.3. PTSD, MOOD AND ANXIETY DISORDERS, AND TEs

In the total sample, 25 patients (6%) were assessed by the clinicians as having PTSD. The frequency of PTSD was 12% (N=25) in the sample of patients who reported any traumatic event (N=208), regardless of the TE definition. In patients who reported a TE-AB, the PTSD rate was 31.9% (15 out of 47). The likelihood of assigning PTSD increased from TE-A1 to TE-A. As expected, a diagnosis of PTSD was highly associated with TE-AB, χ^2 (3, n= 414) = 67.76, p < .001 (Table 3.3).

Of all patients with a principal diagnosis unipolar mood disorder (UMD) (without PTSD), 47.4% reported any TE, regardless the TE definition. Moreover, 13.1% (18 out of 137) of UMD patients reported a TE with re-experiencing symptoms (TE-AB) without being diagnosed with PTSD. When looking at UMD patients (without PTSD) who reported any TE, 27.7% (18 out of 65) reported re-experiencing symptoms. In patients with a primary diagnosis of any anxiety disorder without PTSD (AnxD; N=68), the prevalence of any TE, regardless the TE definition, was comparable to that of UMD (47.1%), but the rate for reporting re-experiencing symptoms was relatively low compared to UMD patients: 5.9% (Table 3.5).

Chi-square tests revealed that there were no significant differences within groups in TEs

for UMD, χ^2 (3, *n*= 414) = 2.002, *p* = .572 and AnxD, χ^2 (3, *n*= 415) = 2.414, *p* = .415 (Table 3.5). This means that there were no differences between UMD and non-UMD patients regarding the prevalence of the differently defined TEs. The same was found for AnxD patients. However, between the groups UMD, AnxD and PTSD there was a significant association between severity of TEs and diagnosis. Patients with PTSD reported the most TE-AB, followed by UMD and lastly AnxD, χ^2 (9, *n*= 226) = 56.944, *p* < .001 (Table 3.4).

Table 3.3. Impact of TE definition and PTSD.

		No PTSD	PTSD	Total
TE definition	No TE	206	1	207
	TE-A1	111	8	119
	TE-A	40	1	41
	TE-AB	32	15	47
Total		389	25	414

Note: TE= Traumatic Event; A1= PTSD Criterion A1; A= Criteria A1 and A2; AB= Criteria A1, A2, and B; PTSD= Posttraumatic Stress Disorder. All according to DSM-IV.

Table 3.4. Patients with unipolar mood disorders, anxiety disorders, and PTSD and impact of TE definition.

	No TE	**TE-A1**	**TE-A**	**TE-AB**
UMD (N=137)	72 (52.6%)	36 (26.3%)	11 (8%)	18 (13.1%)
AnxD (N=68)	36 (52.9%)	16 (23.5%)	12 (17.6%)	4 (5.9%)
PTSD (N=25)	1 (4%)	8 (32%)	1 (4%)	15 (60%)
Total (N=230)	109	60	24	37

Note: TE= Traumatic Event; TE-A1= PTSD Criterion A1; TE-A= Criteria A1+A2; TE-AB= Criteria A1+A2+B; UMD=Unipolar Mood Disorders without PTSD; AnxD=Anxiety Disorders without PTSD. PTSD= Posttraumatic Stress Disorder. All according to DSM-IV.

Table 3.5. UMD and AnxD subsamples and impact of TE definition.

	No TE	TE-A1	TE-A	TE-AB	Total
No UMD	135 (48.7%)	83 (30%)	30 (10.8%)	29 (10.5%)	277
Yes UMD	72 (52.5%)	36 (26.3%)	11 (8%)	18 (13.1%)	137
Total	207	119	41	47	414
No AnxD	171 (49.3%)	104 (30%)	29 (8.4%)	43 (12.4%)	347
Yes AnxD	36 (52.9%)	16 (23.5%)	12 (17.6%)	4 (5.9%)	68
Total	207	120	41	47	415

Note: TE= Traumatic Event; TE-A1= fulfilling PTSD Criterion A1; TE-A= Criteria A1+A2; TE-AB= Criteria A1+A2+B; UMD=Unipolar Mood Disorders without PTSD; AnxD=Anxiety Disorders without PTSD. All according to DSM-IV.

3.4 DISCUSSION

3.4.1. TYPE AND IMPACT OF TRAUMA, RE-EXPERIENCING, AND PTSD

In order to determine the relevance of the definition of a traumatic event (TE), we examined in a sample of 422 patients referred to a general mental health care outpatient clinic, the prevalence of traumatic events (TEs) according to three definitions (characterized by Criterion A1 (TE-A1), A1 plus A2 (TE-A), and A1, A2, and B (TE-AB) according to the PTSD definition in DSM-IV), and the relationship between these TEs and the classifications PTSD, unipolar mood disorders, and anxiety disorders.

The prevalence of a lifetime Criterion A1 traumatic event in the sample was 50.1%. In community samples, lifetime prevalence rates of TEs in European countries vary with percentages of 41-44% (Knipscheer et al., 2020; Lukaschek et al., 2013), up to even 80% (De Vries & Olff, 2009). Since our sample is a patient sample, 50.1% seems relatively low. In general, differences in sampling methods, measures, definitions of TE, and sociodemographic variables may lead to different outcomes. In our study, we applied a single-question assessment for traumatic events. Whereas this way of assessing TEs is believed to be a useful way of screening in clinical practice (Elhai et al., 2008), it generally yields lower prevalence rates compared to multiple-item assessments (Peirce et al., 2009). Moreover, the study population was generally not very severely mentally ill, with only 31% of the population having received psychiatric treatment before admission, while patients with SMI were excluded.

Of all patients who reported an A1 TE during their lifetime (N=208), 42.3% (N=88) also reported events that met the definition of the whole trauma criterion according to DSM-IV (A1 plus A2). This means that A2 indeed played a gatekeeping role in that it narrowed the definition of what constitutes a TE. This finding is in line with previous studies (e.g., Armour et al., 2011) and provides further evidence that the way the stressor criterion is defined has implications for diagnosing PTSD.

In addition, patients who received prior mental health care reported significantly more severely defined TE categories compared to patients that did not have had mental health care before. This supports the assertion that A1 together with A2 has a greater impact on mental health compared to patients who reported only an A1 traumatic event.

The clinician rated PTSD prevalence in the total sample was 6%. PTSD prevalence rates in community samples vary, with average rates in large samples of 3.5 to 4% (Knipscheer et al., 2020; Liu et al., 2017). However, despite the fact that the PTSD rate in this study is higher than the figures from community samples, 6% for a patient sample is relatively low. An explanation could be that most studies examined patients with severe, chronic mental illness (Cusack et al., 2004; Mauritz et al., 2013), whereas in our study the population suffered from less chronic forms of mental disorders.

The likelihood of assigning PTSD increased from TE-A1 to TE-A. This is in line with a previous study (O'Donnell et al., 2010). These findings again suggest that, more broadly, defining what exactly constitutes a traumatic event affects the prevalence of PTSD.

An interesting finding is that of the clinician-diagnosed patients with PTSD, 32% (N=8) did not meet Criterion A2 according to the TSTI (Table 3.3). It is possible that the clinicians considered Criterion A1 and PTSD symptoms to be of greater value here than A2.

Nowadays, the way of defining the stressor criterion of PTSD is still in debate: the definitions of the stressor criterion by DSM-5 and ICD-11 are very different. In the DSM-5, the trauma criterion has been redefined strictly (APA, 2013), while in the ICD-11 it is more loosely defined and represented as 'exposure to a threatening or horrific event or series of events' (WHO, 2018).

Another way of defining TEs will probably help in the search for a more meaningful definition of trauma. This calls for a different, more substantive view of the trauma criterion. First, a look from a quantitative point of view will be necessary, as there is a continuum in the severity of traumatic stressors (Liu et al, 2017). Second, TEs as such do not always have the same impact on each individual. For this reason, A2 was defined in the DSM-IV. However, A2 is not the best way to define the impact of an event on the individual, as described before. Different qualitative properties of both the event and the individual's response to the event play a role in the experience of the event, such as degree of negativity, suddenness, perceived life threat, and lack of control (Cameron et al., 2010; Carlson & Dalenberg, 2000).

3.4.2. TRAUMA AND RE-EXPERIENCING SYMPTOMS IN MOOD AND ANXIETY DISORDERS

In this study, we had the advantage of examining a broader spectrum of psychopathology compared to community samples or to samples of traumatized patients and found that TEs were common in patients with mental disorders other than PTSD.

There was a high prevalence of A1 TEs in patients diagnosed with unipolar mood disorders (UMD) (47.4%) and anxiety disorders (AnxD) (47.1%) without PTSD while 26.3% and 23.5%, respectively, reported the full Criterion A (A1 plus A2). A notable finding in this study was that 13.1% of UMD patients without PTSD reported re-experiencing symptoms in the past month, while this was the case in 5.9% of patients with AnxD. This is an important finding which is consistent with other studies: re-experiencing symptoms, essential to PTSD, can also be a hallmark of other mental disorders, in particular, UMD without PTSD (Birrer et al., 2007; Bryant et al., 2011; Payne et al., 2019). Diagnostic confusion may easily arise because the perceived characteristics of the intrusions along with the distress they cause, is broadly similar between PTSD and UMD although they show some phenomenological differences: PTSD intrusions typically have a more sensory and here-and-now quality compared to UMD intrusions (Birrer et al. 2007; Bryant et al., 2011).

3.4.3. CLINICAL IMPLICATIONS

In this study, it was found that the way the stressor criterion is defined is important in relation to its psychological consequences. Furthermore, the prevalence of re-experiencing symptoms among patients with traumatic experiences without a PTSD classification was relatively high. This gives debate on the way the traumatic stress criterion should be defined and on the

specificity of the re-experiencing symptoms that are generally considered to belong to PTSD.

First, the present study adds meaningful information to the extensive literature discussing the role of defining the stressor criterion of PTSD. One way to deal with this definition problem would be to let go of the strict definition of Criterion A, like is the case in the ICD-11 (WHO, 2018). This could make sense because even mild stressors can lead to PTSD symptoms or even PTSD. Also, the diagnosis of PTSD is thus straightened out with most other DSM diagnoses that do not have causative criteria. Moreover, this approach would mean that clinicians will be less focused on PTSD as the sole trauma-related disorder and more aware of other psychological disorders associated with trauma as described in this study. Nevertheless, an unlimited extension of the trauma definition will also have several negative consequences. The rationale for PTSD as originally conceived in the DSM-III (APA, 1980), namely a set of symptoms after 'a catastrophic stressor beyond the reach of usual human experience' would cease to exist (Rosen & Lilienfeld, 2008). This would mean that PTSD would totally fall back on the defined set of symptom criteria, likely blurring the clear line between PTSD symptoms and symptoms of other disorders. After all, many PTSD symptoms are part of the criteria for other mental disorders (Spitzer et al., 2007).

TEs during the lifetime often have a profound, disruptive impact on patients' lives. Therefore, a better understanding of defining TEs and investigating its effects on PTSD and certainly other mental disorders is warranted. As some authors have argued, there is a need for a more flexible definition of trauma from a clinical perspective, especially since the course of PTSD and other psychological complaints can differ according to the severity and variability of the events (Cameron et al., 2010). Therefore, we propose to define TEs in a clear, but above all more substantive, flexible and personalized way. In other words: TEs should be defined both in a quantitative and a qualitative scale. A more explicitly defined quantitative scale should reflect the stressor dose with the characteristics 'degree of severity', 'duration', and 'number and/or variety of events'. In addition to the stressor dose, a qualitative scale should include specific characteristics that determine the impact of TEs namely 'extreme powerlessness or lack of control', 'highly negative experience', 'suddenness of the experience' (Carlson & Dalenberg, 2000; Kleber & Brom, 2003), and 'perceived life threat' (Berna et al., 2012). All these features can be brought together in a dimensional model of the stressor criterion.

Second, the findings that re-experiencing symptoms are common in mood and anxiety disorders have important consequences in clinical practice: these often prominent symptoms may erroneously lead to the diagnosis of PTSD, while the diagnosis of UMD should be made. They may lead to specific PTSD treatment options in UMD patients without PTSD (Laugharne et al., 2010). This would not be a problem if PTSD and UMD with traumatic re-experiencing both represent the same underlying condition, e.g. due to an inaccuracy in our classification. Indeed, several authors have suggested that PTSD and depression stem from similar predictive variables and a shared vulnerability, and argued that these disorders should not be considered as entirely distinct conditions (O'Donnell et al., 2004; Stander et al., 2014). Others argue that trauma-related depression is a distinct subtype within the group of mood disorders (Harald

& Gordon, 2012). In this case, other treatment options may be needed. Further research is important, because despite the high number of re-experiencing symptoms in non-PTSD diagnoses, there are as yet no clear treatment guidelines for these conditions (Flory & Yehuda, 2015).

3.4.4. STRENGTHS AND LIMITATIONS

Several limitations apply to the present study. Firstly, for DSM-IV axis I classifications no use was made of validated diagnostic instruments. Instead the clinical judgement of two experienced clinicians was used. Secondly, interrater reliability in the use of the TSTI was not evaluated. Thirdly, the TSTI only used a single item survey for TEs. This fits well in clinical practice but a drawback may be an underreporting of the prevalence of TEs compared to multi-item checklists. Fourthly, in our sample of psychiatric outpatients patients with severe mental illness were excluded, and thus generalizability to all psychiatric patients is not clear. Strengths of the study are the large sample which consisted of a heterogeneous group of psychiatric outpatients who were referred to a mental health clinic that was not specifically specialized in psychotrauma. The sample therefore showed a broad range of psychopathology that closely resembles the patients most mental health clinicians encounter in their daily practice.

3.4.5. CONCLUSION

The definition of a traumatic event is of considerable importance, for example for identifying (alleged) trauma victims in specific populations, for diagnosing possible PTSD, for treatment options, and for research. Especially for clinicians, a new and flexible, personalized way to define the traumatic stressor criterion will provide a way to weigh the impact of the TE on the specific patient and give it a more meaningful character. It will allow both clinicians and patients to identify the important differences between the wide variety of traumatic experiences people have endured. A one size fits all definition of trauma will not do justice to the individual patient, and the impact it has on his or her life, both in terms of psychopathology and interpersonal and social functioning. In addition, the fact that re-experiencing symptoms are relatively common in mood disorders means that clinicians should be aware that these symptoms should not automatically lead to a PTSD diagnosis. In these cases correct recognition, but above all adapted treatment programs are needed.

AUTHOR CONTRIBUTIONS

RJ: conceptualization, methodology, investigation, formal analysis, writing – original draft preparation
MvV: methodology, investigation, formal analysis, writing – review and editing
JK: writing – review and editing
RK: writing – review and editing, supervision
PB: writing – review and editing, supervision

REFERENCES

Adler, A. B., Wright, K. M., Bliese, P. D., Eckford, R., & Hoge, C. W. (2008). A2 diagnostic criterion for combat-related posttraumatic stress disorder. *Journal of Traumatic Stress*, *21*(3), 301-308. doi:10.1002/jts.20336

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.*).* Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.*).* Arlington, VA: Author.

Armour, C., Layne, C. M., Naifeh, J. A., Shevlin, M., Duraković-Belko, E., Djapo, N., Pynoos, R.A., & Elhai, J. D. (2011). Assessing the factor structure of posttraumatic stress disorder symptoms in war-exposed youths with and without Criterion A2 endorsement. *Journal of Anxiety Disorders*, *25*(1), 80-87. doi:10.1016/j.janxdis.2010.08.006

Berna, G., Vaiva, G., Ducrocq, F., Duhem, S., & Nandrino, J. L. (2012). Categorical and dimensional study of the predictive factors of the development of a psychotrauma in victims of car accidents. *Journal of Anxiety Disorders*, *26*(1), 239-245. doi:10.1016/j.janxdis.2011.11.011

Birrer, E., Michael, T., & Munsch, S. (2007). Intrusive images in PTSD and in traumatised and non-traumatised depressed patients: A cross-sectional clinical study. *Behaviour Research and Therapy*, *45*(9), 2053-2065. doi:10.1016/j.brat.2007.03.005

Bodkin, J. A., Pope, H. G., Detke, M. J., & Hudson, J. I. (2007). Is PTSD caused by traumatic stress?. *Journal of Anxiety Disorders*, *21*(2), 176-182. doi:10.1016/j.janxdis.2006.09.004

Breslau, N., & Kessler, R. C. (2001). The stressor criterion in DSM-IV posttraumatic stress disorder: An empirical investigation. *Biological Psychiatry*, *50*, 699–704. doi:10.1016/s0006-3223(01)01167-2

Brewin, C. R., Lanius, R. A., Novac, A., Schnyder, U., & Galea, S. (2009). Reformulating PTSD for DSM-V: life after Criterion A. *Journal of Traumatic Stress, 22*(5), 366–373. doi:10.1002/jts.20443 19743480

Bryant, R. A., O'Donnell, M. L., Creamer, M., McFarlane, A. C., & Silove, D. (2011). Posttraumatic intrusive symptoms across psychiatric disorders. *Journal of Psychiatric Research, 45*(6), 842-847. doi:10.1016/j.jpsychires.2010.11.012

Cameron, A., Palm, K., & Follette, V. (2010). Reaction to stressful life events: What predicts symptom severity? *Journal of Anxiety Disorders*, *24*(6), 645-649. doi:10.1016/j.janxdis.2010.04.008

Carlson, E. B., &Dalenberg, C. J. (2000). A Conceptual Framework for the Impact of Traumatic Experiences. *Trauma, Violence, & Abuse, 1*(1), 4–28. doi:10.1177/1524838000001001002

Cusack, K.J., Frueh, B.C., & Brady, K.T. (2004). Trauma history screening in a community mental health center. *Psychiatric Services, 55,* 157-162. doi:10.1176/appi.ps.55.2.157

De Vries, G. J., & Olff, M. (2009). The lifetime prevalence of traumatic events and posttraumatic stress disorder in the Netherlands. *Journal of Traumatic Stress*, *22*(4), 259-267. doi:10.1002/jts.20429

Elhai, J. D., Franklin, C. L., & Gray, M. J. (2008). The SCID PTSD module's trauma screen: Validity with two samples in detecting trauma history. *Depression and Anxiety*, *25*(9), 737-741. doi:10.1002/da.20318

Flory, J. D., & Yehuda, R. (2015). Comorbidity between post-traumatic stress disorder and major depressive disorder: alternative explanations and treatment considerations. *Dialogues in Clinical Neuroscience*, *17*(2), 141-150. doi:10.31887/DCNS.2015.17.2/jflory

Friedman, M. J. (2013). Finalizing PTSD in DSM-5: Getting here from there and where to go next. *Journal of Traumatic Stress*, *26*(5), 548-556. doi:10.1002/jts.21840

Friedman, M. J., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety*, *28*, 750–769. doi:10.1002/da.20767

Frueh, B. C., Elhai, J. D., & Acierno, R. (2010). The future of posttraumatic stress disorder in the DSM. *Psychological Injury and Law*, *3*(4), 260-270. doi:10.1007/s12207-010-9088-6

Gold, S. D., Marx, B. P., Soler-Baillo, J. M., & Sloan, D. M. (2005). Is life stress more traumatic than traumatic stress?. *Journal of Anxiety Disorders*, *19*(6), 687-698. doi:10.1016/j.janxdis.2004.06.002

Harald, B., & Gordon, P. (2012). Meta-review of depressive subtyping models. *Journal of Affective Disorders*, *139*(2), 126-140. doi:10.1016/j.jad.2011.07.015

Kleber, R. J. & Brom, D. (2003). *Coping with trauma: Theory, prevention and treatment*. Abingdon, UK: Taylor & Francis.

Knipscheer, J., Sleijpen, M., Frank, L., de Graaf, R., Kleber, R., ten Have, M., & Dückers, M. (2020). Prevalence of potentially traumatic events, other life events and subsequent reactions indicative for posttraumatic stress disorder in the Netherlands: a general population study based on the trauma screening questionnaire. *International Journal of Environmental Research and Public Health*, *17*(5), 1725. doi:10.3390/ijerph17051725

Kuzminskaite, E., Vinkers, C. H., Milaneschi, Y., Giltay, E. J., & Penninx, B. W. (2022). Childhood trauma and its impact on depressive and anxiety symptomatology in adulthood: A 6-year longitudinal study. *Journal of Affective Disorders*, *312*, 322-330. doi:10.1016/j.jad.2022.06.057

Laugharne, J., Lillee, A., & Janca, A. (2010). Role of psychological trauma in the cause and treatment of anxiety and depressive disorders. *Current Opinion in Psychiatry, 23*(1), 25-29. doi:10.1097/YCO.0b013e3283345dc5

Long, M. E., Elhai, J. D., Schweinle, A., Gray, M. J., Grubaugh, A. L., & Frueh, B. C. (2008). Differences in posttraumatic stress disorder diagnostic rates and symptom severity between Criterion A1 and non-Criterion A1 stressors. *Journal of Anxiety Disorders*, *22*(7), 1255-1263. doi:10.1016/j.janxdis.2008.01.006

Liu, H., Petukhova, M. V., Sampson, N. A., Aguilar-Gaxiola, S., Alonso, J., Andrade, L. H., Bromet, E. J., De Girolamo, G., Haro, J. M., Hinkov, H., Kawakami, N., Koenen, K. C., Kovess-Masfety, V., Lee, S., Medina-Mora, M.E., Navarro-Mateu, F., O'Neill, S., Piazza, M., Posada-Villa, J., ... Kawakami, N. (2017). Association of DSM-IV posttraumatic stress disorder with traumatic experience type and history in the WHO World Mental Health Surveys. *JAMA Psychiatry*, *74*(3), 270-281. doi:10.1001/jamapsychiatry.2016.3783

Lukaschek, K., Kruse, J., Emeny, R. T., Lacruz, M. E., von Eisenhart Rothe, A., & Ladwig, K. H. (2013). Lifetime traumatic experiences and their impact on PTSD: a general population study. *Social Psychiatry and Psychiatric Epidemiology, 48*(4), 525-532. doi:10.1007/s00127-012-0585-7

Mauritz, M. W., Goossens, P. J., Draijer, N., & Van Achterberg, T. (2013). Prevalence of interpersonal trauma exposure and trauma-related disorders in severe mental illness. *European Journal of Psychotraumatology*, *4*(1), 19985. doi:10.3402/ejpt.v4i0.19985

Mock, S. E., & Arai, S. M. (2011). Childhood trauma and chronic illness in adulthood: mental health and socioeconomic status as explanatory factors and buffers. *Frontiers in psychology*, *1*, 246. doi:10.3389/fpsyg.2010.00246

O'Donnell, M. L., Creamer, M., &Pattison, P. (2004). Posttraumatic stress disorder and depression following trauma: understanding comorbidity. *The American Journal of Psychiatry, 161*(8), 1390–1396. doi:10.1176/appi.ajp.161.8.1390 15285964

O'Donnell, M. L., Creamer, M., McFarlane, A. C., Silove, D., & Bryant, R. A. (2010). Should A2 be a diagnostic requirement for posttraumatic stress disorder in DSM-V?. *Psychiatry Research*, *176*(2-3), 257-260. doi:10.1016/j.psychres.2009.05.012

Olff, M. (2017). Sex and gender differences in post-traumatic stress disorder: an update. European Journal of Psychotraumatology, 8(sup4), 1351204. doi:10.1080/20008198.2017.1351204

Payne, A., Kralj, A., Young, J., & Meiser-Stedman, R. (2019). The prevalence of intrusive memories in adult depression: A meta-analysis. *Journal of Affective Disorders*, *253*, 193-202. doi:10.1016/j.jad.2019.04.055

Peirce, J. M., Burke, C. K., Stoller, K. B., Neufeld, K. J., & Brooner, R. K. (2009). Assessing traumatic event exposure: comparing the Traumatic Life Events Questionnaire to the Structured Clinical Interview for DSM-IV. *Psychological Assessment*, *21*(2), 210. doi:10.1037/a0015578

Robinson, J. S., & Larson, C. (2010). Are traumatic events necessary to elicit symptoms of posttraumatic stress? *Psychological Trauma: Theory, Research, Practice, and Policy*, *2*(2), 71. doi:10.1037/a0018954

Rosen, G. M., & Lilienfeld, S. O. (2008). Posttraumatic stress disorder: An empirical evaluation of core assumptions. *Clinical Psychology Review*, *28*, 837–868. doi:10.1016/j.cpr.2007.12.002

Spitzer, R. L., First, M. B., & Wakefield, J. C. (2007). Saving PTSD from itself in DSM-V. *Journal of Anxiety Disorders*, *21*(2), 233-241. doi:10.1016/j.janxdis.2006.09.006

Stander, V. A., Thomsen, C. J., & Highfill-McRoy, R. M. (2014). Etiology of depression comorbidity in combat-related PTSD: a review of the literature. *Clinical Psychology Review*, *34*(2), 87-98. doi:10.1016/j.cpr.2013.12.002

Stein, J. Y., Wilmot, D. V., & Solomon, Z. (2016). Does one size fit all? Nosological, clinical, and scientific implications of variations in PTSD Criterion A. *Journal of Anxiety Disorders*, *43*, 106-117. doi:10.1016/j.janxdis.2016.07.001

Weathers, F. W., & Keane, T. M. (2007). The Criterion A problem revisited: Controversies and challenges in defining and measuring psychological trauma. *Journal of Traumatic Stress*, *20*(2), 107-121. doi:10.1002/jts.20210

WHO (2018). *International Classification of Diseases for Mortality and Morbidity Statistics* (11th Revision). Retrieved from https://icd.who.int/browse11/l-m/en

'It may be readily surmised that where the best thinkers have failed to produce an unexceptionable classification, the failure must be due to some inherent difficulty of the subject.' [10]

10 Spitzka, E.C. (1887). *Insanity: its classification, diagnosis, and treatment: A manual for students and practitioners of medicine*. Bermingham & Co. Retrieved from p. 495: Aftab, A. & Ryznar, E. (2021). Conceptual and historical evolution of psychiatric nosology. *International Review of Psychiatry*, *33*(5), 486-499.

Symptom severity in PTSD and comorbid psychopathology: A latent profile analysis among traumatized veterans

Published as:

Jongedijk, R. A., van der Aa, N., Haagen, J. F., Boelen, P. A., & Kleber, R. J. (2019). Symptom severity in PTSD and comorbid psychopathology: a latent profile analysis among traumatized veterans.

Journal of Anxiety Disorders, 62, 35-44. https://doi.org/10.1016/j.janxdis.2018.11.004

4

ABSTRACT

Individuals diagnosed with posttraumatic stress disorder (PTSD) show remarkably different symptom presentations. Identification of diagnostic profiles of PTSD may contribute to knowledge about treatment modifications to enhance treatment effectiveness. The present study aimed to identify symptom severity classes among 236 Dutch veterans based on a broad range of psychopathology outcomes, including PTSD, using Latent Profile Analysis (LPA). Moreover, multinomial logistic regression was used to test whether class membership could be predicted by the number and characteristics of traumatic event types, coping and personality dimensions. LPA identified three classes of individuals, defined as average, severe, and highly severe symptom severity classes, respectively. No qualitative differences in the symptom dimensions emerged between classes. Veterans with higher amounts of traumatic experiences and specifically with regard to lack of basic human needs, as well as those using more avoidant and problem-focused coping strategies and with more dysfunctional personality characteristics regarding neuroticism and agreeableness were significantly more often in the severe and/or highly severe symptom classes. In conclusion, general symptom severity was found to be an important diagnostic characteristic in this population. Integrated treatments targeting the broad spectrum of mental health problems may be of importance in treating patients that show low therapeutic recovery.

KEYWORDS

Posttraumatic Stress Disorder; Subtypes; Comorbidity; Predictors; Veterans; Latent Profile Analysis

4.1 INTRODUCTION

Individuals with posttraumatic stress disorder (PTSD) (American Psychiatric Association, 1994) can have remarkably different symptom presentations (Galatzer-Levy & Bryant, 2013), and often exhibit a variety of comorbid symptoms or disorders (Ginzburg et al., 2010). Heterogeneity of psychopathology in traumatized individuals is likely to affect treatment outcome (Dalenberg et al., 2012). This is especially pertinent for veterans with PTSD who have been found to show lower treatment recovery rates compared to other traumatized populations (Bradley et al., 2005; Forbes et al., 2012; Steenkamp et al., 2015). Approximately two-thirds of veterans retained the PTSD diagnosis posttreatment (Steenkamp et al., 2015). Identification of PTSD patient profiles or subtypes could provide more insight into this heterogeneity, may help to explain differences in treatment response, and contribute to treatment modifications and enhance treatment effectiveness (Dalenberg, et al., 2012; Flood et al., 2010; Galatzer-Levy & Bryant, 2013; Gerger et al., 2013).

Recent studies on the heterogeneity in symptom presentations among traumatized patients used Latent Profile Analysis (LPA) to determine how individuals, based on shared symptom patterns, group together in classes. LPA has the advantage of using the full range of symptoms instead of categorical diagnoses and using continuous indicators of symptom severity instead of the dichotomized presence or absence of symptomatology (Au et al., 2013). LPA-studies have identified simple vs complex (Cloitre et al., 2013; Elklit et al., 2014), externalizing vs internalizing (Forbes et al., 2010), dissociative (Armour et al., 2014; Tsai et al., 2015), and depressive classes (Cao et al., 2015; Contractor et al, 2017) of PTSD.

Several LPA-studies have found evidence for a classification of PTSD and sometimes comorbid disorders based on the severity rather than the nature of different forms of psychopathology. These severity classes, often characterized by high, moderate, and low symptom severity, were reported for traumatized military populations (Armour et al., 2015; Contractor et al., 2015; Contractor, Caldas, Weiss, & Armour, 2018; Steenkamp et al., 2012) as well as for victims of sexual assault (Au et al., 2013). All these studies identified three or four classes of symptom severity levels and did not report any qualitative differences in symptom distribution.

Little research has been conducted on class membership predictors of traumatized individuals with different symptom profiles. An important predictor for the severity of PTSD symptomatology is the amount and accumulation of traumatization (Renshaw, 2011). Perhaps even more important are the qualitative aspects of the traumatization, including the number of different traumatic event types experienced (Wilker et al., 2015). Two recent reviews reported the importance of distinguishing qualitative trauma classes instead of only a summative trauma event score. Not only high-trauma versus low-trauma classes but also specific trauma classes like e.g., childhood maltreatment differed on mental health correlates. Also, the risk for specific psychiatric disorders differed across these classes (Contractor et al., 2018; O'Donnell et al., 2017).

Besides trauma characteristics, the way a person copes with traumatic situations and their aftermath affects the course of posttraumatic psychopathology. These abilities can be defined by coping styles and personality characteristics. Coping refers to a variety of cognitive and behavioral strategies individuals use to manage external and internal stressors and includes problem-focused (active) coping, emotion-focused coping, avoidant coping and social support seeking (Litman, 2006). It has been demonstrated that active coping is associated with fewer PTSD symptoms, even in a group of veterans with substantial combat exposure (Wolfe et al., 1993), whereas avoidant coping is associated with greater PTSD severity (Badour et al., 2012; Lawrence & Fauerbach, 2003; Sharkansky, et al., 2000).

Personality traits are defined as patterns of behavior, thoughts, and emotions that remain stable over time. Dysfunctional personality traits have found to be positively related to PTSD (Bramsen et al., 2000; Gil & Caspi, 2006; Jakšić et al., 2012). A commonly used personality concept is that of the five-factor model of personality (FFM; also, Big Five personality traits), that includes neuroticism, extraversion, openness, conscientiousness, and agreeableness (Costa & McCrae, 1992). Several studies examined this personality concept in relation to PTSD (see e.g., Jakšić et al., 2012; Stevanović et al., 2016). These studies reported a significant correlation between neuroticism and the risk of developing PTSD symptoms, and poor mental health after exposure to trauma. As for other personality dimensions, the results are inconsistent, but several studies showed an association between PTSD and lower scores on agreeableness, extraversion, and openness (Jakšić et al., 2012).

The aim of this study was two-fold. First, using LPA, this study aimed to identify classes or profiles of psychopathology in a large sample of treatment seeking, trauma-exposed veterans. Previous LPA-studies examined PTSD and co-occurring Major Depressive Disorder (MDD) (Armour et al., 2015; Au et al., 2013), PTSD, MDD, and General Anxiety Disorder (Contractor et al., 2015) or PTSD and specific co-occurring symptoms like anger or impulsive behavior (Contractor et al., 2018). To our knowledge, this is the first study to examine a broad range of symptoms of psychopathology next to PTSD in traumatized patients. Second, this study examined how the different symptom classes were associated to several predictors not previously investigated in LPA-studies, including the number of qualitatively different traumatic events, the specific types of events, as well as different coping styles and personality characteristics.

Based on previous research, it was hypothesized that a three-class solution representing increased levels of overall symptom severity was best-fitting. Secondly, it was hypothesized that a higher total amount of different traumatic events, more avoidant coping and more dysfunctional personality traits, especially neuroticism, and less agreeableness, extraversion and openness would predict membership of the more severe symptom classes.

4.2 METHODS

4.2.1. PARTICIPANTS AND PROCEDURE

Participants were trauma-exposed Dutch military veterans referred for treatment at ARQ Centrum'45, the Dutch national center for diagnostics and treatment of patients with long-lasting trauma related disorders.

All questionnaires were administered as part of a routine diagnostic assessment during the intake procedure to all patients applying for treatment at Centrum'45. Assessments were primarily conducted for diagnostic procedures and secondarily for research purposes. To identify classes or profiles of psychopathology using LPA, cross-sectional data on general psychopathology and PTSD symptoms were used. These were available for 236 participants. Questionnaires with regard to general psychopathology and PTSD symptoms were continuously part of the test battery since Centrum '45 started the routine diagnostic assessment procedure in 2001. To predict membership of the identified classes of psychopathology, data on the predictor variables (i.e., potential traumatic experiences, coping strategies, and Big Five personality traits) were used. Because the measures on these constructs were substituted or excluded from the test battery during the period in which data for the present study were collected, data on these constructs were available for part of the total sample of 236 participants for whom data on general psychopathology and PTSD symptoms were available. Specifically, data on potential traumatic experiences were available for a subsample of 112 participants, and data on coping strategies and Big Five personality traits were available for a subsample of 118 participants. Participants in the total sample were almost exclusively male (97%) and had a mean age of 41.6 years (SD = 10.0). No significant differences with regard to sex and age were found between both subsamples and the total sample. All participants were exposed to combat-related traumatic events, such as life-threatening situations, combat, violence, injury, and witnessing suffering and death. Table 4.2 shows that the majority of the participants scored above the clinical cut-off score of PTSD indicating a clinical level of PTSD symptom severity.

Data have been archived anonymously for scientific research purposes. The institutional review board of Leiden University stated that no review of the ethical merits of the study was needed because assessments were conducted primarily for diagnostic purposes within the institution and only secondarily for data analysis.

Severity of symptoms regarding nine symptom dimensions assessed with the Brief Symptom Inventory were compared to a large Dutch reference group consisting of 4650 adult outpatients who were referred for mood, anxiety, and somatoform complaints to a large center for mental health care in The Netherlands (De Beurs, 2011). The majority of the outpatients were female (63%) and had a mean age of 37.7 years (SD = 12.2). When interpreting the results the reader should realize that the reference group is representative of Dutch outpatients with mood, anxiety, and somatoform complaints (De Beurs, 2011) but not for military veterans and patients with psychotrauma related complaints.

4.2.2. MEASURES

Psychopathology

Self-reported severity of different symptom dimensions of psychopathology was assessed using the Dutch translation of the Brief Symptom Inventory (BSI; De Beurs, 2011; Derogatis & Melisaratos, 1983). Participants are asked how much they are bothered by 53 symptoms, rated on a 5-point scale (*not at all*, *a little bit*, *moderately*, *quite a bit*, *extremely*). Symptom severity scores regarding nine symptom dimensions, i.e., *somatization*, *obsessive-compulsive*, *interpersonal sensitivity*, *depression*, *anxiety*, *hostility*, *phobic anxiety*, *paranoid ideation*, and *psychoticism*, were computed by averaging responses on the corresponding items. Scores could range between 0 and 4 with higher scores reflecting more severe symptoms. Good psychometric properties were reported for the Dutch translation of the BSI (De Beurs, 2011). The internal consistency of the symptom dimensions in the present study sample was acceptable to good (Cronbach's alpha ranging between 0.72 – 0.89). To enable interpretation of the symptom severity scores, symptom severity levels were used. Based on percentiles in the distribution of symptom severity scores in the reference group, seven symptom severity levels were established for each symptom dimension: *very low* (0-5%), *low* (5-20%), *below average* (20-40%), *average* (40-60%), *above average* (60-80%), *high* (80-95%), *very high* (95-100%) (De Beurs, 2011). In the present study, symptom severity on each of the symptom dimensions was considered low if a participant's score was below the 20th percentile in the distribution of symptom severity scores in the reference group; it was considered average if it fell into the 20-80th percentile; and it was considered high if it was above the 80th percentile. Gender differences in symptom severity scores were taken into account, since symptom severity levels for the reference group were specified for males and females separately.

PTSD symptoms

Self-reported PTSD symptoms were assessed with the Self-Rating Inventory for PTSD (SRIP; Hovens et al., 2002) or the second part of the Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992). About half of the participants, participating before 2010, completed the SRIP, whereas the other half was assessed after 2010 with the HTQ. The SRIP asks participants how much they were bothered by 22 PTSD-symptoms during the past 4 weeks, whereas the HTQ asks how much participants were bothered by 16 PTSD-symptoms during the past week. Both instruments use the same 4-point response scale (*not at all*, *a little bit*, *quite a bit*, or *extremely*) and the items of both scales were based on and closely resemble the DSM-IV symptoms of PTSD. The PTSD symptom severity score was computed by averaging responses on the list of 22 PTSD-symptoms of the SRIP, or on the list of 16 symptoms of the HTQ, into one single score. The PTSD symptom severity score could range between 1 and 4 with higher scores reflecting more severe PTSD symptoms. Combining the data from both instruments was considered feasible because of the following reasons. First, both instruments had similar item content derived from DSM-IV PTSD symptoms. Second, both instruments had identical response scales. Third, correlations between PTSD severity and severity of the BSI dimensions were similar

when PTSD was assessed with the SRIP or HTQ. Table 4.1 presents the correlations between PTSD symptom severity assessed with the HTQ and SRIP and the nine symptom dimensions of the BSI. It can be seen that the correlations were mostly positive, large, and significant, although some correlations of the SRIP with BSI dimensions were weaker compared to the correlations of the HTQ with these dimensions. Fourth, variation in and the distribution of scale PTSD symptom severity scores on both instruments were very similar (details can be obtained from the first author). Finally, good psychometric properties have been reported for both the SRIP (Hovens et al., 2002) and HTQ (Mollica et al., 1992) and internal consistencies of the SRIP and HTQ (Cronbach's alpha = 0.94 and 0.92 respectively) in the present study sample were also good.

Table 4.1. Pearson correlation coefficients between PTSD symptom severity scores as assessed with the SRIP and HTQ with the severity scores on the symptom dimensions of the BSI.

	SRIP PTSD symptom severity	HTQ PTSD symptom severity
Somatization	0.52*	0.70*
Obsessive-compulsive	0.70*	0.78*
Interpersonal sensitivity	0.53*	0.72*
Depression	0.63*	0.83*
Anxiety	0.74*	0.80*
Hostility	0.63*	0.62*
Phobic anxiety	0.71*	0.75*
Paranoid ideation	0.59*	0.72*
Psychoticism	0.65*	0.78*

Note: * $p < .001$.

Exposure to potential traumatic events

Self-reported degree of exposure to traumatic events was assessed with the first part of the HTQ. Participants were asked to indicate their level of exposure to 19 types of potential traumatic events on a 4-point scale (*experienced, witnessed, heard of* or *no exposure)*. The total number of potential traumatic events was calculated by counting the number of self-experienced traumatic events. The resulting score has a potential maximum of 19. In a population of refugees it has been shown that traumatic events as assessed with the Harvard Trauma Questionnaire (HTQ) cluster on four separate domains of traumatic events (Knipscheer et al., 2015). These four domains were events concerning 'human right abuses' (e.g., torture, watching torture, serious injury, kidnapping, imprisonment), 'traumatic loss' (murder of family member or friend, unnatural death of family or friend, murder of strangers), 'lack of basic human needs' (lack of shelter, lack of food or water, ill health without access to medical care) and 'separation from others' (forced separation from family members, forced isolation from others). The total number of potential traumatic events within each domain was calculated by counting the number of self-experienced traumatic events within the domains (the potential

maximum scores were 7 for human right abuses; 3 for traumatic loss; 3 for lack of basic human needs; 2 for separation from others).

Coping strategies

Coping strategy was assessed with the Cope-Easy (Kleijn et al., 2000), an adapted version of the COPE inventory (Carver et al., 1989). Participants are asked to indicate how inclined they are to respond to difficult situations with 32 coping-related behaviors, rated on a 4-point scale (*not applicable to me, a little applicable to me, quite a bit applicable to me, very much applicable to me*). Responses were classified into 15 subscales which, according to Litman (2006), could be further classified into four broad coping strategies: *problem-focused coping* (active coping, planning, suppression), *emotion-focused coping* (restraint coping, positive reinterpretation, acceptance, humor), *avoidant coping* (denial, behavioral disengagement, mental disengagement, substance abuse), and *social support seeking* (instrumental social support, emotional social support, venting). Scores on each subscale and coping strategy scale were calculated by averaging the corresponding item and subscale scores and could range between 1 and 4 with higher scores reflecting more frequent use of the corresponding coping strategy. Psychometric properties of the Cope-Easy were comparable to those reported with regard to the COPE inventory (Kleijn et al., 2000). Internal consistency of the coping strategy scales in the present study sample was acceptable to good (Cronbach's alpha ranging between 0.65 – 0.83).

Personality traits

The FFM of personality was assessed with the NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992). Participants were asked to indicate to what extent they agreed with 60 personality-related statements, rated on a 5-point scale (*strongly disagree, disagree, neutral, agree, strongly agree*). Scores on the five personality traits, i.e., *neuroticism*, *extraversion*, *openness*, *agreeableness*, and *conscientiousness*, were computed by summing responses on the corresponding items. Scores could range between 12 and 60 with higher scores reflecting higher levels of the corresponding personality trait. Internal consistency of the personality trait scales in the present study sample was acceptable to good (Cronbach's alpha ranging between 0.65 - 0.89).

4.2.3. STATISTICAL ANALYSES

Since the range of the scale of the PTSD symptom dimension (1-4) was different from the range of the scale of the symptom dimensions regarding psychopathology (0-4), scores on all symptom dimensions were standardized to simplify interpretation of the LPA results. LPA in MPlus version 7.3 (Muthén & Muthén, 1998-2012) was used to identify classes based on severity of psychopathology. LPA is a statistical technique used to classify individuals into homogeneous latent classes or subgroups. The robust maximum likelihood estimator (MLR) was used, in combination with full information maximum likelihood estimation to include

participants with missing data. Complete data were available for 94.5% of the participants. To avoid local likelihood maxima 1000 random sets of starting values in the first and 100 in the second step of optimization were requested and 50 initial stage iterations were used. In LPA it is common to estimate a series of models with increasing numbers of latent classes until a model is not identified or when no acceptable model fit is achieved (DiStefano & Kamphaus, 2006; Masyn, 2013). Model fitting was terminated after estimating a model with seven latent classes because the majority of model fit indices indicated a worse fit of this model compared to the model with six latent classes. The model with the least number of latent classes with acceptable model fit and classification quality, as well as theoretical substantive meaning was selected as the most optimal solution. The Bootstrapped Likelihood Ratio Test (BLRT), Lo-Mendell-Rubin adjusted likelihood ratio test (LMR-A), and the Bayesian Information Criterion (BIC) were used as model fit criteria to compare models with different class solutions. Using the BLRT and LMR-A test, the estimated model is compared to a model with 1 class less. A significant p-value indicates that the estimated model fits the data better than the model with 1 class less (Nylund et al., 2007). Regarding the BLRT, 500 bootstrap samples were requested with 50 sets of starting values in the first and 20 in the second step of optimization to avoid local likelihood maxima in each bootstrap sample. BIC makes a trade-off between model fit and model complexity with a lower value of BIC indicating a better fit of the model to the data (Van der Schoot et al., 2012). BLRT did not yield a significant p-value and the lowest value of BIC was reached in a highly complex model with six latent classes – a situation common to LPA (Masyn, 2013). As an alternative, diminishing gains in model fit according to the log likelihood and BIC across models with increasing number of latent classes were explored. When increasing the number of latent classes is starting to be accompanied by a diminishing gain in model fit this indicates a marginal and non-substantive gain in information; it is therefore likely that the minimal number of classes with substantive meaning and acceptable model fit is reached at this point (Masyn, 2013; Nylund et al, 2007). To evaluate classification quality the entropy statistic was used, in combination with the average assignment probabilities for each individual class. Classification quality is considered adequate when entropy values are > .80 (Celeux & Soromenho, 1996).

Class membership was predicted by regressing the latent classes in the optimal class solution on a set of observed predictor variables (i.e., number and domains of potential traumatic event types, coping strategies, and Big Five personality traits) by conducting a series of multinominal logistic regression models using the three-step procedure in Mplus (Asparouhov & Muthén, 2014). Because data on the predictor variables were available for subsamples of different composition and MPlus handles missing values in the predictor variables with list wise deletion in this context, separate multinomial regression models were estimated for each of the 4 predictor variable domains (i.e., total number of potential traumatic events, types of potential traumatic events, coping strategies, and Big Five personality traits).

4.3 RESULTS

4.3.1. OVERALL SYMPTOM SEVERITY

Symptom severity and endorsement with regard to all symptom dimensions are presented in Table 4.2. With regard to all symptom dimensions, the large majority of participants scored above the clinical cut-off score, indicating clinical levels of symptom severity. This indicates that participants in the present study did not suffer with regard to one single symptom dimension, but rather suffered with regard to multiple co-morbid symptom dimensions.

Table 4.2. Untransformed mean symptom severity scores and the percentage of participants with clinical symptom severity with regard to 10 symptom dimensions of psychopathology.

	Mean (SD) original scale	Mean (SD) 0 – 100 scale	% in clinical range
PTSD	2.69 (0.66)	56.50 (22.16)	63.4
Somatization	1.22 (0.80)	30.49 (20.07)	78.4
Obsessive-compulsive	2.19 (0.98)	54.79 (24.48)	88.8
Interpersonal sensitivity	1.48 (0.99)	37.02 (24.84)	74.7
Depression	1.92 (0.98)	47.98 (24.59)	89.3
Anxiety	2.01 (1.01)	50.22 (25.14)	91.8
Hostility	1.67 (1.03)	41.87 (25.81)	88.0
Phobic anxiety	1.65 (1.20)	41.19 (29.90)	83.6
Paranoid ideation	1.67 (1.02)	41.70 (25.62)	78.5
Psychoticism	1.43 (0.86)	35.85 (21.44)	84.5

Note: Mean (SD): Mean levels and standard deviations of symptom severity based on the untransformed, original scores of the BSI (range: 0-4) and HTQ (range: 1-4); PTSD = Posttraumatic Stress Disorder.

4.3.2. LATENT PROFILE ANALYSIS

Table 4.3 presents the model fitting results of the LPA with 10 symptom dimensions. The 2- and 3-class solutions yielded significant BLRT and LMR-A tests, indicating that fit of the 2-class solution was better than the single-class solution and that the fit of the 3-class solution was better than the 2-class solution. This was also supported by the BIC. The 4- to 7-class solutions showed mixed results. The 4- to 7-class solutions yielded significant BLRT tests, indicating the best fit for the 7-class solution. The LMR-A was not significant in the 4- to 7-class solution, suggesting that the 3-factor solution fitted the data best. BIC indicated the 6-class solution as the best fitting model. Since BLRT did not yield a significant p-value and the lowest value of BIC was reached in the highly complex model with six latent classes, gain in model fit according to the log likelihood and BIC across models with increasing numbers of latent classes was also explored. In Table 4.3 the following pattern can be seen: the log likelihood and BIC increase by a substantial amount when moving from one class to two classes and from two classes to three classes. When moving from three classes to four classes and across subsequent classes there is a diminishing gain in log likelihood and BIC. According to the log likelihood and BIC, the model

with 3 latent classes is the most parsimonious model with acceptable model fit, which is also in line with LMR-A.

Table 4.3. Model fitting results for latent profile analysis of severity of psychopathology.

	Entropy	BIC	Log-likelihood	BLRT		LMR-A	
				-2LL difference	p-value	Value	p-value
1 Class	1.000	6688.809	-3289.766	--	--	--	--
2 Classes	0.926	5562.158	-2696.390	1186.740	<0 .001	11167.330	< 0.001
3 Classes	**0.916**	**5222.392**	**-2496.456**	**399.889**	**<0 .001**	**393.324**	**0.002**
4 Classes	0.888	5161.290	-2435.853	121.195	< 0.001	119.221	0.337
5 Classes	0.866	5147.880	-2399.097	73.506	< 0.001	72.309	0.450
6 Classes	0.870	5137.499	-2363.856	70.486	< 0.001	69.329	0.276
7 Classes	0.892	5153.969	-2342.040	43.629	< 0.001	42.918	0.195

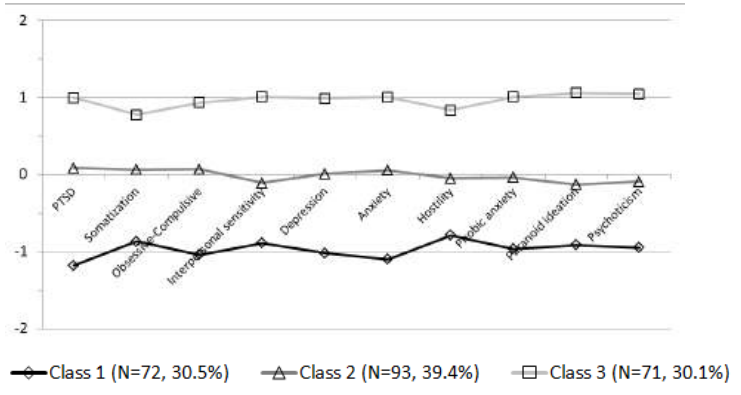
Note: Best fitting model is printed in bold. BIC = Bayesian Information Criterion; BLRT = Parametric bootstrapped likelihood ratio test; -2LL difference = -2 times log-likelihood difference between a N class solution and N – 1 class solution; LMR-A = Lo-Mendell-Rubin adjusted likelihood ratio test.

Figure 4.1 depicts the mean symptom severity on the symptom dimensions in each of the classes for the 3-, 4-, 5-, and 6-class solution. Because all scores on the symptom dimensions were standardized, the mean symptom severity scores in Figure 4.1 are also standardized. The 3-class solution was preferred over the 4-class solution because the second and third class in the 4-class solution were very similar to the second class in the 3-class solution. The 3-class solution was also preferred over the 5- and 6-class solution because the class sizes in the 5- and 6-class solutions were small and did not add to the interpretability of the results. The entropy value of 0.916 indicated that classification quality of the 3-class solution was adequate. The average assignment probabilities for each individual class also indicated a high precision of the classification for the 3-class solution: 0.959 for the first class, 0.974 for the second class, and 0.956 for the third class. The 3-class solution was therefore selected as the most meaningful and parsimonious model.

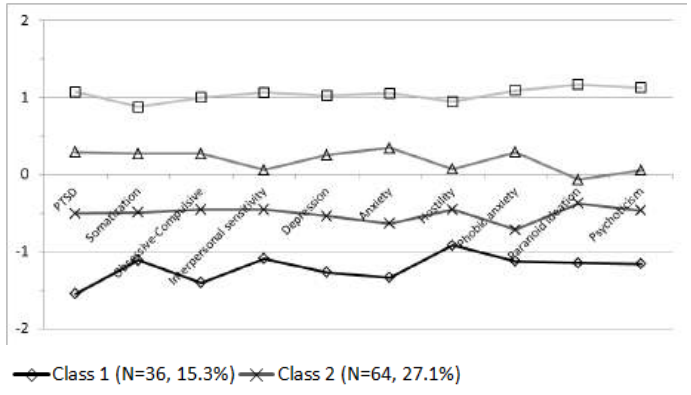
In Figure 4.1A can be seen that participants in the first class showed the lowest symptom severity on the symptom dimensions compared to participants in the second and third class. Figure 4.2 presents the percentage of participants in each class reporting low (non-clinical), average and high severity on the symptom dimensions compared to a large reference group of Dutch outpatients. Figure 4.2A shows that most participants endorsed in the first class reported low or average symptom severity on the symptom dimensions compared to the reference group. The first class was therefore labeled as the average severity symptom class. Participants in the second class reported lower symptom severity compared to those in the third class but more severe symptom severity than participants in the first class as can be seen in Figure 4.1A. Figure 4.2B shows that most participants in the second class reported average or severe symptom severity compared to the reference group.

Figure 4.1. Mean scores (standardized) on the symptom dimensions in each of the classes for the 3-, 4-, 5-, and 6-class solution.

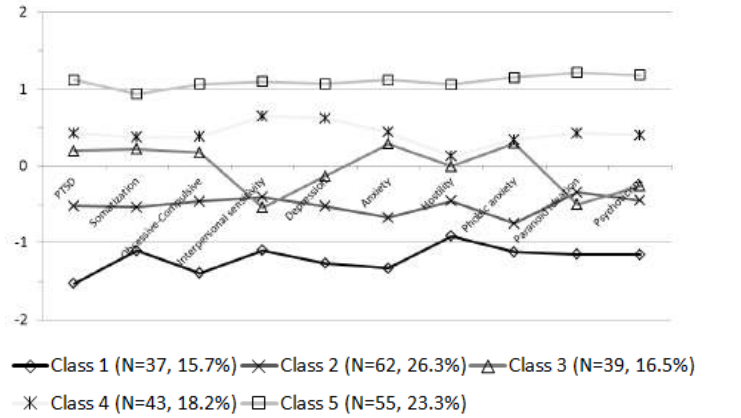
A. 3-class solution



B. 4-class solution



C. 5-class solution



D. 6-class solution

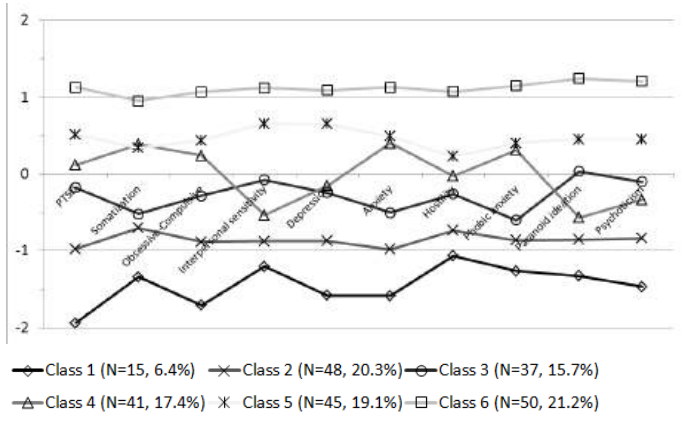
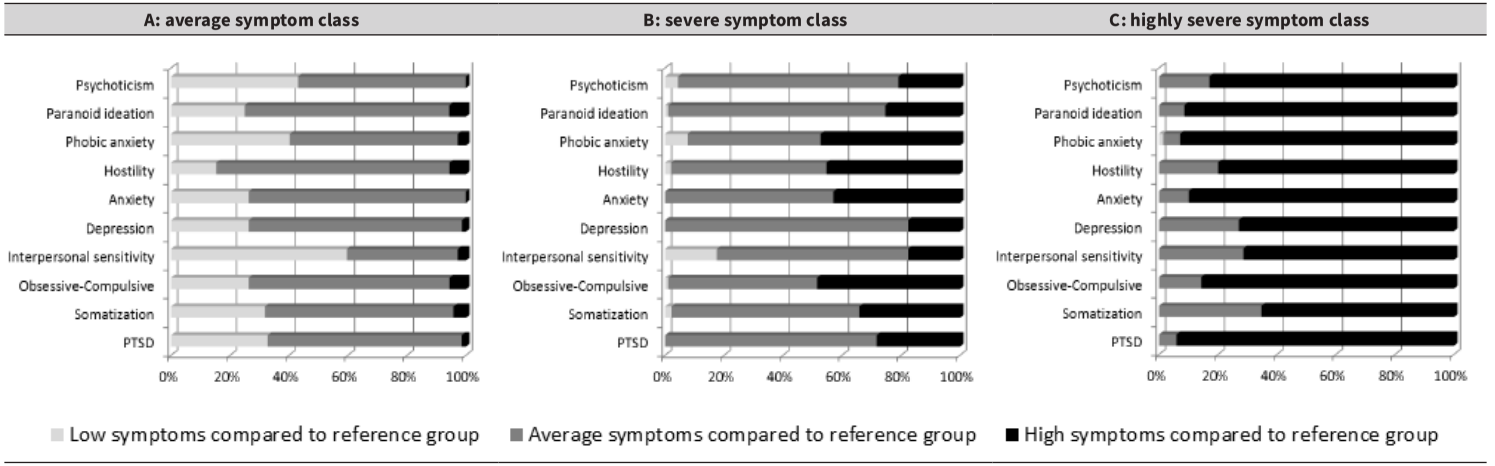


Figure 4.2. Percentage of participants with low, average, and high symptom severity with regard to the symptom dimensions compared to a reference group of outpatients for each of the three classes.



The second class was therefore labeled as the severe symptom class. Figure 4.1A showed that the third class consisted of participants reporting the most severe symptoms of all classes. Figure 4.2C shows that the large majority of participants in the third class reported higher symptom severity compared to the reference group. The third class was therefore labeled as the highly severe symptom class. Overall, 30.5% (N=72) of participants were classified into the average symptom class, 39.4% (N=93) in the severe symptom class, and 30.1% (N=71) into the highly severe symptom class.

4.3.3. PREDICTORS OF CLASS MEMBERSHIP

Means and standard deviations of the total number of types of potential traumatic events, number of potential traumatic events within the trauma domains, coping strategies, and personality traits are presented in Table 4.4. Results of the multinomial logistic regression analyses are presented in Table 4.5. The B coefficients (log odds) indicate how much more or less likely it becomes to be in a symptom severity class compared to the other symptom severity classes, with every unit increase in the predictor variable. In the first and second model the latent classes were regressed on the total number and domains of potential traumatic event types respectively. In the third and fourth model the latent classes were regressed on coping strategies and Big Five personality traits respectively.

Participants with higher levels of problem-focused and avoidant coping, and those who reported more potential traumatic event types and lack of basic human needs were significantly more often in the highly severe symptom class compared to the average severity symptom class. Participants with higher levels of agreeableness were significantly less often in the highly severe symptom class compared to the average severity symptom class. Traumatic event types of human right abuses, traumatic loss, and separation from others, as well as the coping strategies social support seeking and emotion-focused coping, and the personality traits neuroticism, extraversion, openness, and conscientiousness did not differentiate between the highly severe and average severity symptom class.

Participants reporting higher levels of avoidant coping and lower levels of agreeableness were significantly more often in the highly severe symptom class compared to the severe symptom class. The number of potential traumatic event types, as well as the trauma domains did not differentiate between the highly severe and severe symptom class. The same holds for the coping strategies and personality traits except avoidant coping and agreeableness.

Participants who reported more potential traumatic event types and those with higher levels of avoidant coping and neuroticism were significantly more often in the severe symptom class compared to the average symptom class. The trauma domains did not differentiate between the severe and average symptom class. The same holds for the coping strategies problem-focused coping, social support seeking, and emotion-focused coping, as well as all personality traits except neuroticism.

Table 4.4. Means scores (M) and standard deviations (SD) of predictor variables for each latent class.

	Average severity class		Severe symptom class		Highly severe class	
	N	M (SD)	N	M (SD)	N	M (SD)
Traumatic event types						
Total number	27	5.44 (4.16)	41	9.15 (3.85)	40	10.23 (4.09)
Human right abuses	27	1.30 (2.02)	41	2.73 (1.86)	40	2.60 (2.00)
Traumatic loss	27	0.67 (0.92)	41	0.88 (0.90)	40	1.33 (1.14)
Separation from others	27	0.33 (0.56)	41	0.78 (0.79)	40	0.93 (0.83)
Lack of basic human needs	27	0.93 (1.07)	41	1.85 (1.17)	40	2.18 (0.98)
Coping strategies						
Problem-focused coping	44	2.78 (0.55)	49	2.73 (.60)	23	2.82 (0.65)
Avoidant coping	43	1.75 (0.32)	47	1.99 (.38)	25	2.25 (0.48)
Social support seeking	43	2.15 (0.57)	48	2.15 (.66)	24	2.01 (0.68)
Emotion-focused coping	43	2.26 (0.51)	47	2.14 (.51)	25	2.14 (0.47)
Personality traits						
Neuroticism	43	34.19 (7.87)	47	41.83 (7.12)	26	47.62 (7.41)
Extraversion	44	37.77 (7.46)	46	33.46 (6.26)	26	27.65 (6.19)
Openness	43	36.58 (5.42)	45	36.27 (6.54)	26	34.19 (4.78)
Agreeableness	41	41.22 (5.18)	47	39.51 (6.13)	25	33.12 (5.53)
Conscientiousness	44	44.20 (5.46)	47	39.77 (6.23)	26	1.08 8.00)

4.4 DISCUSSION

In a clinical sample of 236 treatment seeking traumatized Dutch veterans with long-lasting PTSD and general psychopathology, LPA identified three classes of individuals with different severity levels of psychopathology. By comparing our findings to a large reference group of male mental health care outpatients in the Netherlands, our three classes were labelled as an 'average', a 'severe' and a 'highly severe' symptom severity class.

As far as we know, this is the first LPA-study that not only investigated PTSD and MDD, but a broad range of general psychopathology domains. Also, testing whether class membership could be predicted by potential traumatic event types, coping styles and personality traits was done for the first time.

4.4.1. DIAGNOSTIC CHARACTERISTICS

Differences between the identified classes could only be characterized by differences in symptom severity with regard to a broad spectrum of symptom dimensions. No qualitative differences with regard to the symptom dimensions have emerged between the classes (see Figure 4.1). This signifies that not only PTSD or MDD, as found in previous studies (Armour et al., 2015; Au et al., 2013; Contractor et al., 2015), but a broad spectrum of mental health symptoms is associated with the psychological distress found in a severe traumatized population. An important consequence of this findings is that classification of overall symptom severity is more important compared to classification of separate mental disorders like PTSD or MDD when diagnosing traumatized patients with enduring complaints.

Table 4.5. Multinomial regression analysis of severity of psychopathology classes on number of potential traumatic event types, coping styles, and personality traits.

	Severe symptom class			Highly severe symptom class					
	Versus average symptom class			Versus average symptom class			Versus severe symptom class		
	B	SE	95% CI B	B	SE	95% CI B	B	SE	95% CI B
Traumatic event types									
Total number	0.49*	0.24	0.02 - 0.95	0.53*	0.23	0.08 - .98	0.05	0.06	-0.06 – 0.16
Human right abuses	0.53	1.25	-1.92 - 2.98	0.30	1.16	-1.97 - 2.57	-0.23	0.18	-0.59 – 0.13
Traumatic loss	0.12	0.78	-1.41 - 1.65	0.60	0.70	-0.77 - 1.97	0.48	0.28	-0.08 – 1.03
Separation from others	0.57	0.81	-1.02 - 2.16	0.80	0.70	-0.58 - 2.17	0.23	0.39	-0.53 – 0.99
Lack of basic human needs	0.55	0.31	-0.05 - 1.15	0.78*	0.29	0.21 - 1.35	0.23	0.25	-0.25 – 0.72
Coping strategies									
Problem-focused coping	0.26	0.53	-0.78 - 1.30	1.36*	0.66	0.06 - 2.66	1.10	0.61	-0.08 – 2.29
Avoidant coping	1.97*	0.68	0.63 - 3.31	4.46*	1.12	2.26 - 6.66	2.49*	1.09	0.36 – 4.63
Social support seeking	-0.17	0.41	-0.97 - 0.64	-0.78	0.55	-1.85 - 0.30	-0.61	0.54	-1.67 – 0.45
Emotion-focused coping	-0.45	0.60	-1.62 - 0.72	-0.29	0.85	-1.95 - 1.37	0.16	0.76	-1.33 – 1.64
Personality traits									
Neuroticism	0.10*	0.04	0.02 - 0.17	0.21	0.12	-0.02 - 0.44	0.11	0.12	-0.13 – 0.35
Extraversion	-0.02	0.05	-0.11 - 0.07	-0.11	0.06	-0.23 - 0.00	-0.09	0.05	-0.20 – 0.01
Openness	-0.03	0.05	-0.13 - 0.06	-0.04	0.07	-0.18 - 0.09	-0.01	0.06	-0.13 – 0.11
Agreeableness	0.00	0.06	-0.11 - 0.11	-0.22*	0.08	-0.38 - -0.05	-0.22*	0.09	-0.39 – -0.05
Conscientiousness	-0.07	0.05	-0.17 - 0.04	-0.01	0.08	-0.16 - 0.15	0.06	0.07	-0.08 – 0.20

Note: * $p < .05$.

Based on this finding it could be argued that not just the severe traumatic experiences, but perhaps even more the long-lasting posttraumatic symptomatology and the subsequent stressors cause diffuse psychopathology and comorbidity. Prior research showed that soldiers with high levels of combat exposure and high PTSD severity levels reported more post-deployment stressors (Sharkansky et al., 2000) and reacted stronger to stressors in general (Smid et al., 2013). Severe PTSD and subsequent stressors lead to enduring posttraumatic stress responses, causing a mix of psychopathology and gradual loss of adaptive abilities, lower levels of occupational and social adjustment, detrimental effects on psychosocial functioning and poorer health related functioning (Armour et al., 2015; Au et al., 2013; Sareen et al., 2007; Stander et al., 2014; Tsai et al., 2012). These findings support the previously described concept of a cascade of symptoms or syndromes evolving over time, initiated by either the original traumatic events or by PTSD itself (Alarcon et al., 1999).

4.4.2. PREDICTORS OF SEVERITY CLASSES

Participants with a higher amount of different traumatic event types were significantly more often in the highly severe and severe symptom class compared to the average severity symptom class. This indicates that the number of traumatic event types appeared to be a general predictor of overall symptom severity. Looking more in detail to qualitative aspects of traumatic events, we clustered the HTQ-events in four qualitative domains of traumatic experience according to the findings of Knipscheer et al. (2015). Only traumatic events related to 'lack of basic human needs' appeared to differentiate between the highly severe symptom class and the average severity symptom class. The other domains of traumatic event types did not differentiate between the classes. Lack of basic human needs can be defined by a lack of material supportive kind of needs. A possible explanation for this finding can be that material (and social) support during and after trauma experiences is perceived as an important factor influencing severity and duration of psychopathology (Sripada et al., 2016; Tsai et al., 2012).

With respect to coping mechanisms we found that participants with higher levels of avoidant coping were more often in the severe and highly severe symptom class compared to the average severity symptom class. This finding is in line with previous studies. Avoidance in general interferes with the normal processing of traumatic memories, and is associated with high levels of PTSD, persistence of psychopathology and poor adjustment and this is also the case for avoidant coping (Badour et al., 2012; Sharkansky et al., 2000, Tsai et al., 2012). Remarkably, participants with higher levels of problem-focused coping were also more often in the highly severe symptom class compared to the average severity symptom class. This is not in line with previous findings (Sharkansky et al., 2000), though overlap in use of active, problem-focused and avoidant coping styles are reported (Schnider, Elhai, & Gray, 2007). Veterans in the highly severe symptom class may have more urge to deal with perceived threats, psychopathology and their dysfunctioning. Increased coping behaviour reflects a certain degree of mastery over the situation. In the face of overwhelming stress related demands, the individual is forced to employ several coping strategies simultaneously, amongst them also

problem-focused coping strategies (Wind & Komproe, 2017).

For personality characteristics according to the FFM, we found that participants in the highly severe symptom class showed lower 'agreeableness' compared to the average symptom class. Agreeableness did not differentiate between the severe and average symptom class. Persons with the characteristic 'less agreeableness' are usually less warm and friendly, get along less well with others and have a less optimistic view of human nature (Costa & McCrae, 1992). Individuals with such personality characteristics may be more vulnerable because they are more prone to be socially isolated and hence receive less social support. In general, less social support is associated with poor mental health and poor psychosocial functioning. Participants in the severe symptom class showed significantly higher levels of neuroticism compared to the average severity class. Participants in the highly severe symptom class showed even higher levels of neuroticism. However, neuroticism appeared not to differentiate significantly between the highly severe and average symptom class, which is most likely due to the small sample size of the highly severe symptom class. Persons with higher levels of neuroticism tend to react with strong emotions to stressful events, suffer more from depressive moods and feelings of anger and anxiety, have a higher level of threat appraisal and distress to stressful events and tend to have less social support. Each of these factors make neuroticism to be a risk factor for psychopathology in general and more specific for PTSD, symptom severity and poor mental health outcomes (Breslau & Schultz, 2013; Jakšić, et al., 2012; Stevanović, et al., 2016).

Taken together, we can conclude in line with previous research, that participants in the average symptom class had experienced less traumatic event types, and had less dysfunctional personality characteristics in comparison to participants in the severe and highly severe classes, with lower scores on agreeableness and higher levels of neuroticism. Comparing the two higher symptom severity classes, higher levels of avoidant coping and lower levels of agreeableness but not the trauma characteristics differentiated between these two classes. This suggests that personality characteristics are of more importance in differentiating between highly severe and severe symptom classes than the experienced amount or nature of traumatic events.

4.4.3. CLINICAL IMPLICATIONS

The results have implications for the classification of PTSD. In the DSM-5, severity subtypes for several mental health disorders are included (APA, 2013). Next to existing PTSD-subtypes like the dissociative subtype, the description of subtypes on the continuum of severity could also be an important way to classify PTSD. Further, clinicians should not only focus on specific DSM-diagnoses, but they should also keep in mind a broad diagnostic perspective, with attention to comorbid symptoms, disorders and significant psychosocial dysfunctions. This is especially important for patients with a high amount of different traumatic event types experienced and with enduring mental health complaints.

Classification of subtypes should have implications for treatment outcomes (Dalenberg et al., 2012). Whether differences in severity levels have consequences for treatment efficacy could

not be investigated in this study. In several previous studies, high severity and chronic PTSD but also poor adjustment levels, mental defeat, feelings of less hope, extensive comorbidity and feelings of anger in combat veterans are associated with poor treatment outcome results (Forbes et al., 2003; Haagen et al., 2015, Lloyd et al., 2014). As these predictors are likely to be associated with severe psychopathology, especially the veterans who belong to the highly severe symptom class might not benefit fully from regular PTSD treatment approaches.

We found that especially an avoidant coping style, and personality characteristics with high levels of neuroticism and low levels of agreeableness were more often in the severe symptom classes compared to the average symptom class. As previous studies suggested, avoidant coping not only predicts greater PTSD severity but also a poorer treatment response. Adapting trauma treatment programs, specifically targeting dysfunctional avoidant coping mechanisms could be advantageous, especially in case of highly severe, chronic traumatized patients with low recovery rates (Badour et al., 2012). High neuroticism is associated with a tendency to utilize less social support, a higher sensitivity to stress, and a higher level of threat appraisal and negative affect. Each of these factors is associated with poorer mental health outcomes (Jakšić et al., 2012; Stevanović et al., 2016). Together with the findings of less agreeableness and a higher amount of the trauma characteristic 'lack of basic human needs' in the highly severe symptom class, our findings suggest that it would be useful if treatment focused on helping patients to strengthen their skills in seeking social support and handle their sensitivity to cope with stressful events.

In summary, the occurrence of high and enduring levels of PTSD and a wide range of co-morbid psychopathology can lead to chronic mental health problems, protracted loss of general adaptive abilities and poor treatment response. For these patients, the frequently used treatment protocols that usually target either just PTSD, just depression, or just any other disorder should be adapted. In case of long-lasting psychopathology in traumatized patients, clinicians must keep in mind that there is not merely a distinct disorder requiring a specific intervention. The additional host of emotional problems, mental health symptoms and disorders, but also dysfunctions in coping and personality should become an important focus in treatment and can improve treatment efficacy in patients that show reduced therapeutic recovery.

4.4.4. STRENGTHS AND LIMITATIONS

The strengths of this study are the relatively large sample size of treatment seeking veterans with long-lasting psychopathology, the use of LPA, and looking beyond PTSD into a broad range of psychopathology. Also, the comparison of the study sample with a large reference group of outpatients, and the investigation of several predictors of class membership are strengths of this study. Limitations are, that predictors can merely be interpreted as class characteristics as our study could not demonstrate a longitudinal or causal relation. Other limitations are the use of self-report questionnaires that could give a response bias. Also combined HTQ and SRIP scores were used, though combining both instruments was considered feasible since both

instruments had similar content and identical response scales. Finally, the sample existed of treatment seeking and predominantly male veterans with enduring symptoms. Generalization to other populations has therefore to be done with caution.

4.4.5. CONCLUSION

In this LPA among a large sample of treatment seeking severe traumatized war veterans with long-lasting mental health problems, three classes were found with different levels of severity of PTSD but also of a broad range of general psychopathology and PTSD. Classes differed with regard to symptom severity but no qualitative differences between symptom dimensions have emerged. This corresponds with previous findings among veterans (e.g., Armour et al., 2015; Contractor et al., 2015). Accumulation of different traumatic event types in general and regarding the trauma domain lack of basic human needs, as well as avoidant and problem-focused coping strategies and personality traits of neuroticism and agreeableness appeared to differentiate between the classes. Veterans with higher amounts of traumatic experiences in general and with regard to lack of basic human needs were more often in the severe and/or highly severe symptom class, as well as those using more avoidant and problem-focused coping strategies and with more dysfunctional personality characteristics with regard to neuroticism and agreeableness.

In case of treatment, the results suggest that only focussing on PTSD will hide attention to other important emotional and psychosocial problems and may lead to inadequate treatment approaches. Moreover, focussing on a broader perspective then merely on separate disorders and focussing also on dysfunctional coping styles and personality characteristics can be of major importance in treatment efficacy of patients with chronic and severe PTSD that show lower therapeutic recovery.

AUTHOR CONTRIBUTIONS

RJ: conceptualization, methodology, formal analysis, writing – original draft preparation
NvdA: methodology, formal analysis, data curation, writing – original draft preparation
JH: writing – review and editing
PB: writing – review and editing, supervision
RK: writing – review and editing, supervision

REFERENCES

Alarcon, R.D., Glover, S.G., & Deering, C.G. (1999). The cascade model: An alternative to comorbidity in the pathogenesis of posttraumatic stress disorder. *Psychiatry, 62*, 114-124. doi:10.1080/00332747.1999.11024860

American Psychiatric Association APA (1994). *Diagnostic and statistical manual of mental disorders* (4th edition). American Psychiatric Association, Washington, DC.

American Psychiatric Association APA (2013). *Diagnostic and statistical manual of mental disorders* (5th edition). American Psychiatric Association, Washington, DC.

Armour, C., Elklit, A., Lauterbach, D., & Elhai, J.D. (2014). The DSM-5 dissociative-PTSD subtype: Can levels of depression, anxiety, hostility, and sleeping difficulties differentiate between dissociative-PTSD and PTSD in rape victims? *Journal of Anxiety Disorders, 28,* 418-426. doi:10.1016/j.janxdis.2013.12.008

Armour, C., Contractor, A., Elhai, J.D., Stringer, M., Lyle, G., Forbes D., & Richardson, J.D. (2015). Identifying latent profiles of posttraumatic stress and major depression symptoms in Canadian veterans: exploring differences across profiles in health related functioning. *Psychiatry Research, 228*, 1-7. doi:10.1016/j.psychres.2015.03.011

Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: A 3-step approach using Mplus. *MPlus webnotes: No. 15*. https://www.statmodel.com/download/webnotes/webnote15.pdf.

Au, T.A., Dickstein, B.D., Comera, J.S., Salters-Pedneault, K., & Litz, B.T. (2013). Co-occurring posttraumatic stress and depression symptoms after sexual assault: A latent profile analysis. *Journal of Affective Disorders, 49*, 209–216. doi:10.1016/j.jad.2013.01.026

Badour, C. L., Blonigen, D. M., Boden, M. T., Feldner, M. T., & Bonn-Miller, M. O. (2012). A longitudinal test of the bi-directional relations between avoidance coping and PTSD severity during and after PTSD treatment. *Behaviour Research and Therapy*, *50*(10), 610-616. doi:10.1016/j.brat.2012.06.006

Bradley, R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A multidimensional meta-analysis of psychotherapy for PTSD. *American Journal of Psychiatry, 162*(2), 214-227. doi:10.1176/appi.ajp.162.2.214

Bramsen, I., Dirkzwager, A.J.E., & Van der Ploeg, H.M. (2000). Predeployment personality traits and exposure to trauma as predictors of posttraumatic stress symptoms: A prospective study of former peacekeepers. *American Journal of Psychiatry, 157,* 1115-1119. doi:10.1176/appi.ajp.157.7.1115

Breslau, N., & Schultz, L. (2013). Neuroticism and post-traumatic stress disorder: a prospective investigation. *Psychological Medicine*, *43*(8), 1697-1702. doi:10.1017/S0033291712002632

Cao, X., Wang, L., Cao, C., Zhang, J., Liu, P., Zhang, B., … Elhai, J.D. (2015). Patterns of DSM-5 posttraumatic stress disorder and depression symptoms in an epidemiological sample of Chinese earthquake survivors: A latent profile analysis. *Journal of Affective Disorders, 186*, 58–65. doi:10.1016/j.jad.2015.06.058

Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology, 56*, 267-283. doi:10.1037//0022-3514.56.2.267

Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification, 13*, 195-212. doi:10.1007/BF01246098

Cloitre, M., Gavert, D.W., Brewin, C.R., Bryant, R.A., & Maercker, A. (2013). Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis. *European Journal of Psychotraumatology, 4*: 20706. doi:10.3402/ejpt.v4i0.20706.

Contractor, A.A., Elhai, J.D., Fine, T.H., Tamburrino, M.B., Cohen, G., Shirley, E., … Calabrese, J.R. (2015). Latent profile analyses of posttraumatic stress disorder, depression and generalized anxiety disorder symptoms in trauma-exposed soldiers. *Journal of Psychiatric Research, 68*, 19-26. DOI:10.1016/j.jpychires.2015.05.014

Contractor, A. A., Elhai, J. D., Fine, T. H., Tamburrino, M. B., Cohen, G., Shirley, E., ... & Calabrese, J. R. (2015). Latent profile analyses of posttraumatic stress disorder, depression and generalized anxiety disorder symptoms in trauma-exposed soldiers. *Journal of Psychiatric Research*, *68*, 19-26. doi:10:1016/j.jpsychires.2015.05.014

Contractor, A. A., Roley-Roberts, M. E., Lagdon, S., & Armour, C. (2017). Heterogeneity in patterns of DSM-5 posttraumatic stress disorder and depression symptoms: Latent profile analyses. *Journal of Affective Disorders, 212*, 17-24. doi:10.1016/j.jad.2017.01.029

Contractor, A. A., Caldas, S., Fletcher, S., Shea, M. T., & Armour, C. (2018). Empirically derived lifespan polytraumatization typologies: A systematic review. *Journal of Clinical Psychology*. doi:10.1002/jclp.22586

Costa, P.T., & McCrae, R.R. (1992). *Revised NEO personality inventory and NEO five factor inventory.* Odessa, FL:

Psychological Assessment Resources.

Dalenberg, C.J., Glaser, D., & Alhassoon, O.M. (2012). Statistical support for subtypes in posttraumatic stress disorder: The how and why of subtype analysis. *Depression and Anxiety, 29*, 671-678. doi:10.1002/da.21926

De Beurs, E. (2011). Brief Symptom Inventory – BSI – *Handleiding, herziene editie 2011*. The Netherlands, Leiden: PITS B.V.

Derogatis, L., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. *Psychological Medicine, 13*(3), 595-605. doi:10.1017/S0033291700048017

DiStefano, C. & Kamphaus, R.W. (2006). Investigating subtypes of child development: a comparison of cluster analysis and latent class cluster analysis in typology creation. *Educational and Psychological Measurement, 66(5)*, 778-794. doi:10.1177/0013164405284033.

Elklit, A., Hyland, P., & Shevlin, M. (2014). Evidence of symptom profiles consistent with posttraumatic stress disorder and complex posttraumatic stress disorder in different trauma samples. *European Journal of Psychotraumatology, 5*. doi:10.3402/ejpt.v5.24221.

Flood, A.M., Boyle, S.H., Calhoun, P.S., Dennis, M.F., Barefoot, J.C. Moore, S.D., & Beckham, J.C. (2010). Prospective study of externalizing and internalizing subtypes of posttraumatic stress disorder and their relationship to mortality among Vietnam veterans. *Comprehensive Psychiatry, 51*, 236–242. doi:10.1016/j.comppsych.2009.08.002.

Forbes, D. Creamer, M., Hawthorne, G., Allen, N., & McHugh, T. (2003). Comorbidity as a predictor of symptom change after treatment in combat-related posttraumatic stress disorder. *Journal of Nervous and Mental Disease,191*(2), 93-99. doi:10.1097/01.NMD.0000051903.60517.98

Forbes, D., Elhai, J. D., Miller, M. W., & Creamer, M. (2010). Internalizing and externalizing classes in posttraumatic stress disorder: A latent class analysis. *Journal of Traumatic Stress, 23*(3), 340-349. doi:10.1002/jts.20526; 10.1002/jts.20526

Forbes, D., Lloyd, D., Nixon, R. D., Elliott, P., Varker, T., Perry, D., … Creamer, M. (2012). A multisite randomized controlled effectiveness trial of cognitive processing therapy for military-related posttraumatic stress disorder. *Journal of Anxiety Disorders, 26*(3), 442–452. doi:10.1016/j.janxdis.2012.01.006

Galatzer-Levy I.R., & Bryant, R.A. (2013). 636,120 Ways to have Posttraumatic Stress Disorder. *Perspectives on Psychological Science, 8,* 6: 651-62. doi:10.1177/1745691613504115.

Gerger, H., Munder, T., & Barth, J. (2014). Specific and nonspecific psychological interventions for PTSD symptoms: A meta-Analysis with problem complexity as a moderator. *Journal of Clinical Psychology, 70,* 601–615. doi:10.1002/jclp.22059

Gil, S., & Caspi, Y. (2006). Personality traits, coping style, and perceived threat as predictors of posttraumatic stress disorder after exposure to a terrorist attack: A prospective study. *Psychosomatic Medicine, 68*(6), 904-909. doi:10.1097/01.psy.0000242124.21796.f8

Ginzburg, K., Ein-Dor, T., & Solomon, T. (2010). Comorbidity of posttraumatic stress disorder, anxiety and depression: A 20-year longitudinal study of war veterans. *Journal of Affective Disorders, 123*, 249–257. doi:10.1016/j.jad.2009.08.006.

Haagen, J.F.G., Smid, G.E., Knipscheer, J.W., & Kleber, R.J. (2015). The efficacy of recommended treatments for veterans with PTSD: A metaregression analysis. *Clinical Psychology Review, 40*, 84–194. doi:10.1016/j.cpr.2015.06.008

Hovens, J.E., Bramsen, I., & Van der Ploeg, H.M. (2002). Self-Rating Inventory for posttraumatic stress disorder: Review of the psychometric properties of a new brief Dutch screening instrument. *Perceptual and Motor Skills, 94*(3), 996-1008. doi:10.2466/pms.2002.94.3.996

Jakšić, N., Brajković, L., Ivezić, E., Topić, R., & Jakovljević, M. (2012). The role of personality traits in posttraumatic stress disorder (PTSD). *Psychiatria Danubina, 24*(3), 256-266.

Kleijn, W.C., Van Heck, G.L. & Van Waning, A. (2000). Ervaringen met een Nederlandse bewerking van de COPE coping vragenlijst: de COPE-EASY. [Experiences with a Dutch adaptation of the COPE coping questionnaire: the COPE-EASY]. *Gedrag en Gezondheid, 24*, 213-225.

Knipscheer, J.W., Sleijpen, M, Mooren, T., Ter Heide, F.J.J., & Van der Aa, N. (2015). Trauma exposure and refugee status as predictors of mental health outcomes in treatment-seeking refugees. *British Journal of Psychiatry Bulletin, 39*, 178-182. doi:10.1192/pb.bp.114.047951

Lawrence, J.W. & Fauerbach, J.A. (2003). Personality, coping, chronic stress, social support and PTSD symptoms among adult burn survivors: A path analysis. *Journal of Burn Care & Rehabilitation, 24*(1), 63-72. doi:10.1097/00004630-200301000-00016

Litman, J.A. (2006). The COPE inventory: Dimensionality and relationships with approach-and avoidance-motives and positive and negative traits. *Personality and Individual Differences, 41*, 273-284. doi:10.1016/j.paid.2005.11.032

Lloyd, D., Nixon, R.D.V., Varker, T., Elliotta, P., Perryc, D., Bryant, R.A., … Forbes, D. (2014). Comorbidity in the prediction of Cognitive Processing Therapy treatment outcomes for combat-related posttraumatic stress disorder. *Journal of Anxiety Disorders, 28*, 237-240. doi:10.1016/j.janxdis.2013.12.002

Masyn, K.E. Latent class analysis and finite mixture

modeling. In T.D. Little, *The Oxford Handbook of Quantitative Methods, Volume 2: Statistical Analysis.* Oxford: University Press.

Mollica, R.F., Caspi-Yavin, Y., Bollini, P., Truong, T, Tor, S., & Lavelle, J. (1992). The Harvard Trauma Questionnaire: Validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. *Journal of Nervous and Mental Disease, 180*(2), 111-116.

Muthén, L.K., & Muthén, B.O. (1998-2012). *MPlus User's Guide. Seventh Edition.* Los Angeles, CA: Muthén & Muthén.

Nylund, K.L., Asparouhov, T., & Muthén, B.O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling, 14*(4), 535-569.

O'Donnell, M. L., Schaefer, I., Varker, T., Kartel, D., Forbes, D., Bryant, R. A., ... & Felmingham, K. (2017). A systematic review of person-centered approaches to investigating patterns of trauma exposure. *Clinical Psychology Review, 57,* 208-225. doi:10.1016/j.cpr.2017.08.009

Renshaw, K.D. (2011). An integrated mode of risk and protective factors for post-deployment PTSD symptoms in OEF/OIF era combat veterans. *Journal of Affective Disorders, 128*, 321-326. doi:10.1016/j.jad.2010.07.022

Sareen, J., Cox, B.J., Stein, M.B., Afifi, T.O., Fleet, C., & Asmundson, G.J.G. (2007). Physical and mental comorbidity, disability, and suicidal behavior associated with posttraumatic stress disorder in a large community sample. *Psychosomatic Medicine, 69*, 242-248. doi:10.1097/PSY.0b013e31803146d8

Sharkansky, E., King, D.W., King, L.A., Wolfe, J., Erickson, D.J., & Stokes, L.R. (2000). Coping with Gulf War combat stress: Mediating and moderating effects. *Journal of Abnormal Psychology, 109*(2), 188-197. doi:10.1037/0021-843X.109.2.188

Schnider, K. R., Elhai, J. D., & Gray, M. J. (2007). Coping style use predicts posttraumatic stress and complicated grief symptom severity among college students reporting a traumatic loss. *Journal of Counseling Psychology*, *54*(3), 344. doi:10.1037/0022-0167.54.3.344

Smid, G.E., Kleber, R.J., Rademaker, A.R., Van Zuiden, M., & Vermetten, E. (2013). The role of stress sensitization in progression of posttraumatic distress following deployment. *Social Psychiatry and Psychiatric Epidemiology, 48*, 1743-1754. doi:10.1007/s00127-013-0709-8

Sripada, R.K., Lamp, K.E., Defever, M., Venners, M., & Rauch, S.A. (2016). Perceived social support in multi-era veterans with posttraumatic stress disorder. *The Journal of Nervous and Mental Disease*, *204*, 317-320. doi:10.1097/NMD.0000000000000476

Stander, V.A., Thomson, C.J., & Highfill-McRoy, R.M. (2014). Etiology of depression comorbidity in combat-related PTSD: A review of the literature. *Clinical Psychology Review, 34,* 87–98. doi:10.1016/j.cpr.2013.12.002

Steenkamp, M. M., Nickerson, A., Maguen, S., Dickstein, B. D., Nash, W. P., & Litz, B. T. (2012). Latent classes of PTSD symptoms in Vietnam veterans. *Behavior Modification*, *36*(6), 857-874. doi:10.1177/0145445512450908

Steenkamp, M. M., Litz, B. T., Hoge, C. W., & Marmar, C. R. (2015). Psychotherapy for military-related PTSD: a review of randomized clinical trials. *Jama*, *314*(5), 489-500. doi:10.1001/jama.2015.8370

Stevanović, A., Frančišković, T., & Vermetten, E. (2016). Relationship of early-life trauma, war-related trauma, personality traits, and PTSD symptom severity: a retrospective study on female civilian victims of war. *European Journal of Psychotraumatology*, *7*(1), 30964. doi:10.3402/ejpt.v7.30964

Tsai, J., Armour, C., Southwick, S.M., & Pietrzak, R.H. (2015). Dissociative subtype of DSM-5 posttraumatic stress disorder in U.S. veterans. *Journal of Psychiatric Research, 66*, 67-74. doi:10.1016/j.jpsychires.2015.04.017

Tsai, J., Harpaz-Rotem, I., Pietrzak, R.H., & Southwick, S.M. (2012). The role of coping, resilience, and social support in mediating the relation between PTSD and social functioning in veterans returning from Iraq and Afghanistan. *Psychiatry, 75,* 135-149. doi:10.1521/psyc.2012.75.2.135

Van der Schoot, R., Lugtig, P. & Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology, 9*(4), 486-492. doi:10.1080/17405629.2012.686740

Wilker, S., Pfeiffer, A., Kolassa, S., Koslowski, D., Elbert, T., & Kolassa, I. (2015). How to quantify exposure to traumatic stress? Reliability and predictive validity of measures for cumulative trauma exposure in a post-conflict population. *European Journal of Psychotraumatology, 6*: 10.3402. doi:10.3402/ejpt.v6.28306

Wind, T.R., & Komproe, I.H. (2017). Closing the gap between disaster mental health research and practice: evidence for socio-ecological mental health interventions through multilevel research. *Intervention*, 15(0), 1-13. doi:10.1097/WTF.0000000000000153

Wolfe, J., Keane, T.M., Kaloupek, D.G., Mora, C. A., & Wine, P. (1993). Patterns of positive readjustment in Vietnam combat veterans. *Journal of Traumatic Stress, 6*(2), 179–193. doi:10.1002/jts.2490060203

'When talking about classifications, we should take the word seriously. They are more than lists, glossaries, or inventories. Instead they are structured and commonly hierarchical clusters of objects having a relationship with one another. (….) the problem here is not only our lack of knowledge about taxonomy but the possibility that psychiatric objects may not be susceptible to classification at all.' [11]

11 Retrieved from p. 193: Berrios, G.E. (2014). Defining and classifying mental illness, pp. 180-195. In S. Bloch, S.A. Green, and J. Holmes (eds). *Psychiatry: Past, Present, and Prospect*. Oxford University Press.

Severity profiles of posttraumatic stress, depression, anxiety, and somatization symptoms in treatment seeking traumatized refugees

Published as:
Jongedijk, R. A., Eising, D. D., van der Aa, N., Kleber, R. J., & Boelen, P. A. (2020). Severity profiles of posttraumatic stress, depression, anxiety, and somatization symptoms in treatment seeking traumatized refugees.
Journal of Affective Disorders, 266, 71-81. https://doi/org/10.1016/j.jad.2020.01.077

5

ABSTRACT

BACKGROUND

Western countries are facing many challenges hosting refugees from several regions in the world. Many of them are severely traumatized and suffer from a variety of mental health symptoms, which complicates the identification and treatment of refugees at risk. This study examined subgroups based on a broad range of psychopathology, and several predictors, including trauma characteristics and gender.

METHODS

Participants were 1147 treatment-seeking, traumatized refugees. Latent profile analysis was conducted to identify different subgroups based on levels of posttraumatic stress disorder (PTSD), depression, anxiety, and somatic symptoms. Multinomial logistic regression was used to identify predictors of subgroup membership.

RESULTS

Three distinct subgroups were identified, reflecting Moderate (10.2%), Severe (43.0%), and Highly Severe (45.9%) symptom severity levels, respectively. Symptom severity of all psychopathology dimensions was distributed equally between the subgroups. Participants in the Severe and Highly Severe symptoms subgroups reported more types of traumatic events compared to the Moderate subgroup. In particular, traumatic events associated with human right abuses, lack of human needs and separation from others predicted subgroup membership, as did gender.

LIMITATIONS

The results are confined to treatment-seeking, traumatized refugee populations.

CONCLUSIONS

Distinguishable symptom severity profiles of PTSD, depression, anxiety and somatic complaints could be identified in this large treatment-seeking refugee population, without qualitative differences in symptom distribution. Instead of focusing on specific mental disorders, classification based on overall symptom severity may be of interest in severely traumatized patients. This knowledge will help to identify individuals at risk and to enhance existing treatment programs for specific patient groups.

KEYWORDS

Posttraumatic stress disorder, Comorbidity, Subtype, Refugee, Latent profile analysis, Predictors

5.1 INTRODUCTION

About 15% of the nearly 25.4 million refugees worldwide found their way to Western European countries, with a peak in the asylum applications from 1989 to 2001 and after 2013 (Turner, 2015; UNHCR, 2017). Many refugees are affected not only by multiple and prolonged traumatic experiences but also by significant post-migratory distress (Bogic et al., 2012; Miller & Rasmussen, 2017). These factors often lead to heterogeneous symptom presentations and complex mental health conditions, making this population a challenge for mental health care, with lower recovery rates compared to other traumatized populations (Crumlish & O'Rourke, 2010; Nickerson et al., 2011; Palic & Elklit, 2011; Slobodin & de Jong, 2015).

The prevalence and co-occurrence of mental disorders in refugees are high. Around 55% of all refugees in European countries reported at least one, 36% reported more than one, and 20% even reported more than three current mental disorders (Bogic et al., 2012). Mental health problems frequently reported include symptoms of posttraumatic stress disorder (PTSD), depression, anxiety, and somatization. PTSD prevalence rates among refugees range between 9% and 33%, whereas anxiety and mood disorder rates go up to 55% (Bogic et al., 2012; Fazel et al., 2005; Gerritsen et al., 2006; Steel et al., 2009), and rates of somatic symptoms go up to even 63% (Rohlof et al., 2014). Despite high prevalence rates, somatic symptoms including somatization, are rarely taken into account in existing studies. Because these symptoms may cause important obstacles with diagnosing and treating refugees in mental health care (Rohlof et al., 2014), it is critical to take these into account.

Clarifying the complexity and heterogeneity in symptom presentation is important for recognizing, diagnosing and treating traumatized patients (Crumlish & O'Rourke, 2010; Palic & Elklit, 2010). Insight into this heterogeneity can be gained by the identification of subgroups of individuals showing similar symptom patterns within specific DSM-diagnoses (Dalenberg et al., 2012). Subgroups may differ in terms of the nature of symptoms, that would suggest that assessment and treatment should focus on symptom variations of specific subgroups to enhance treatment efficacy. On the other hand, if subgroups would differ only in terms of overall symptom severity, this would suggest that assessment and treatment efforts should focus on transdiagnostic perspectives and common factors underlying different manifestations of distress (Au et al, 2013; Contractor et al., 2017; Nickerson et al., 2011).

Several prior studies identified subgroups in civilian and military populations based on PTSD symptoms and comorbid psychopathology. Some studies identified qualitatively different subgroups, e.g., regarding symptoms of dissociation (Armour et al., 2014) or symptoms in the domains of affective dysregulation, negative self-concepts, and interpersonal problems (Elklit et al., 2014). Several studies focusing on PTSD with comorbid mood and/or anxiety symptoms have identified subgroups that differed only in terms of symptom severity, with symptoms of PTSD, depression, and anxiety very closely cohered; other studies however, showed mixed results, finding both severity subgroups and qualitatively different subgroups (Table 5.1). Mixed results were also demonstrated in the few studies investigating subgroups of

psychopathology in traumatized refugees, but they did not specifically focus on comorbidity of mood and anxiety symptoms (Table 5.2).

The studies that demonstrated subgroups based on overall symptom severity, underlined the possible continuum of a general posttraumatic stress response with PTSD and a wide range of coinciding symptoms of general psychopathology that are tightly connected. This is supported by findings that show common risk factors and vulnerabilities of comorbid PTSD and depression (Stander et al., 2014), and common non-specific factors underlying co-occurring depression, anxiety, as well as PTSD. Examples of these underlying risk factors are the factor 'negative affect', as postulated by Watson et al. (2011) or the 'general psychopathology' factor or p-factor, suggested by Caspi et al. (2014). Next to underlying mechanisms, several authors described that severe PTSD and subsequent stressors lead to enduring general posttraumatic stress responses, with a variety of symptoms instead of specific disorders with clear boundaries. This causes a gradual loss of adaptive abilities and overall psychosocial and occupational functioning (Armour et al., 2015; Jongedijk et al., 2019).

Table 5.1. Non-refugee LCA/ LPA studies, identifying subgroups of symptoms of PTSD with comorbid symptoms of mood and/ or anxiety.

Study	Sample	Comorbidity symptoms	Number and type of classes	Description of subgroups
Armour et al. (2015)	Military	PTSD, depression	3, severity	High, moderate, low symptom severity
Au et al. (2013)	Sexual assault	PTSD, depression	4, severity	Low, low-moderate, high-moderate, severe symptom severity
Cao et al. (2015)	Earthquake survivors	PTSD, depression	4, mixed severity and type	Low severity, predominantly depression, predominantly PTSD, combined PTSD-depression
Contractor et al. (2015)	Military	PTSD, MDD, GAD	3, severity	Mild, moderate, severe symptom severity
Contractor et al. (2017)	Students	PTSD, depression	3, mixed severity and type	High severity, lower PTSD-higher depression, higher PTSD-lower depression
Hruska et al. (2014)	Motor Vehicle Accidents	PTSD, depression, AoD	4, severity	Resilient, mild, moderate and severe symptom severity for PTSD and depression; not for AoD
Jongedijk et al. (2019)	Military	PTSD, mood, anxiety	3, severity	Average, severe, highly severe symptom severity

Note: PTSD = Posttraumatic Stress Disorder; MDD = Major Depressive Disorder; GAD = Generalized Anxiety Disorder; AoD = alcohol/other drug abuse

Table 5.2. Refugee LCA/LPA studies, identifying subgroups of symptoms of PTSD with and without comorbid symptoms of mood and/or anxiety.

Study	Sample	Comorbidity symptoms	Number and type of classes	Description of subgroups
Minihan et al. (2018)	Refugees	PTSD, no co-morbidity	4, mixed severity and type	No-PTSD, moderate PTSD, high PTSD and high re-experiencing/ avoidance class
Nickerson et al. (2014)	Refugees	PTSD, PGD	4, type	Combined PTSD/PGD, predominantly PTSD, predominantly PGD, resilient class
Tay et al. (2015)	Refugees	PTSD, depression, IED	4, type	PTSD, depressive, IED, and low/no symptom class

Note: IED = Intermittent Explosive Disorder; PTSD = Posttraumatic Stress Disorder; PGD = Prolonged Grief Disorder.

Apart from exploring whether subgroups could be identified based on endorsement of different symptom profiles, our study was also concerned with correlates of subgroup membership. Previous research on predictors of subgroup membership in case of traumatized refugees is scarce. Cumulative trauma exposure has been identified as an important predictor of PTSD and general levels of psychopathology (Knipscheer et al., 2015; Laban et al., 2004; Mollica et al., 1998; Wilker et al., 2015). In a sample of non-treatment-seeking refugees, greater trauma exposure predicted membership of more disturbed subgroups (Minihan et al., 2018). Not only the trauma load, but also the nature of potentially traumatic events (PTEs) has been found to affect symptom presentations (Conrad et al., 2017; Contractor et al., 2018; Momartin et al, 2004; O'Donnell et al., 2017). Some refugee studies found imprisonment, abuse and traumatic loss to be predictors of the more severe symptoms subgroups (Nickerson et al., 2014), whereas others found lack of food and water to be strongly linked with PTSD and depression (Roberts et al., 2008). Because these PTEs possibly differ per conflict, we anticipated that the region of origin might be a predictor for symptom severity in case of refugees. Furthermore, female gender has been found to be associated with more severe or chronic conditions of PTSD, depression, and anxiety (Gerritsen et al., 2006; Olff, 2017; Olff et al., 2007; Tolin & Foa, 2006). For instance, studies among victims of natural disasters found more female individuals in the more severe symptoms subgroups compared to a low severity subgroup (Cao et al., 2015; Zhen et al., 2018).

This study aimed to identify subgroups in a large treatment seeking traumatized refugee sample. To our knowledge, this is the first study in the field of refugees to examine a broad spectrum of comorbid psychopathology in order to identify symptom-based subgroups. Apart from the three DSM-IV based PTSD symptom clusters of re-experiencing, avoidance, and hyperarousal, we also took symptoms of anxiety, depression and somatization into account. Building on previous studies in various populations as well as the already mentioned assumptions of a general post-traumatic stress response, it was hypothesized that subgroups could be identified based on differences in overall symptom severity rather than qualitative differences. The second aim was to investigate whether membership of a specific subgroup could be predicted by exposure to PTEs, specifically PTE types, and gender. We hypothesized

that a higher amount of PTE types and female gender, would predict membership to more severe symptoms subgroups. We also explored if class membership varied as a function of region of origin.

5.2 METHOD

5.2.1. PARTICIPANTS AND PROCEDURE

Participants were trauma-exposed refugees referred for treatment at ARQ Centrum'45, a Dutch national institute for diagnostics and treatment of patients with psychotrauma-related disorders. ARQ Centrum'45 is a highly specialized psychotrauma health care institute. Patients are only admitted if they had one or more previous treatments elsewhere. Hence they always have long lasting complaints. Data were primarily collected for diagnostic purposes before the start of treatment as part of a routine diagnostic assessment procedure, and archived anonymously for scientific research purposes. Participants were informed about the storage of the anonymized assessment data and given the opportunity to have their data removed from the database. Upon consultation, the institutional review board of Leiden University stated that no review of the ethical merits of this study was needed and obtaining informed consent was not requisite, because assessments were conducted primarily for diagnostic and secondarily for research purposes. The questionnaires used in the present study are widely used with refugees and are available in many different languages (Kleijn et al., 2001). For the minority of individuals for whom no translated questionnaires were available interpreters were involved.

For the present study, data collected between 2002 and 2014 were used. Data were available for 1,747 participants with a refugee background. Participants were excluded from the analyses if an assessment at the start of treatment was absent (*n*=535, 30.6%), it was unclear whether the assessment took place at the start of treatment (*n*=21, 1.2%), other instruments than the instruments considered in the present study had been used (*n*=17, 1.0%), and when data entry was not correct (*n*=27, 1.5%). The total sample included 1,147 participants with a refugee background. Characteristics of the sample are described in Table 5.3.

Table 5.3. Sociodemographics.

Characteristics	N	%	Mean	Standard deviation
Gender:				
Male	807	70.4		
Female	340	29.6		
Age			40.93	10.72
Region of origin				
Middle East & North Africa	652	56.8		
Former Yugoslavia	210	18.3		
Sub-Saharan Africa	171	14.9		
Other	114	9.9		

5.2.2. MEASURES

Severity of PTSD-symptoms was assessed with the Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992). Participants rated how much they were bothered by PTSD symptoms during the past week, rated on a 4-point scale (*not at all*, *a little bit*, *quite a bit*, or *extremely*). Total PTSD symptom severity was calculated by averaging the responses on all items. Scores with regard to the DSM-IV PTSD symptom dimensions of re-experiencing, avoidance, and arousal were computed by averaging the responses on the corresponding items. A cut-off score of 2.5 is recommended to identify clinically significant PTSD (Mollica et al., 1996a). Internal consistencies of the items representing the three dimensions were adequate, with α's ranging from 0.71 to 0.76.

Symptoms of anxiety and depression were assessed with the Hopkins Symptom Checklist-25 (HSCL-25; Mollica et al., 1996b). Participants indicated how much they were bothered by 10 symptoms of anxiety and 15 symptoms of depression during the past week, rated on a 4-point scale (*not at all*, *a little bit*, *quite a bit*, or *extremely*). Symptom severity with regard to anxiety and depression was calculated by averaging responses on the anxiety and depression items. A cut-off score of 1.75 is recommended to indicate clinically significant anxiety or depression (Mollica et al., 1996). Internal consistency of the scales was high (α's were 0.87 and 0.88).

Both the HTQ and the HSCL-25 were translated into the most common languages spoken by refugees referred for treatment at ARQ Centrum'45, i.e., Arabic, Farsi, Serbo-Croatian, and Russian. Both instruments have been shown to have good psychometric qualities and adequate validity in studies with refugees (Hollifield et al., 2002; Lavik et al., 1999). In addition, refugees with different language backgrounds appear to interpret the items and underlying concepts of both instruments in a similar way (Wind et al., 2017).

Somatic complaints were assessed with a shortened version of the Pennebaker Inventory of Limbic Languidness (PILL). The original questionnaire asks participants to rate the presence of 54 physical symptoms (Pennebaker, 1982). To make the PILL less time consuming, the shortened questionnaire asks participants to rate how often they were bothered by 26 somatic complaints during the past 12 months on a 5-point scale (*rarely or never, sometimes, regularly, often,* or *very often*). This revised version showed good psychometric properties (Gijsbers van Wijk & Kolk, 1996). Scores were summed to yield an index of the severity of somatic complaints, ranging between 26 and 130 (current study α = 0.87).

Exposure to PTEs was assessed with the HTQ. Participants rated their level of exposure to 19 types of PTEs on a 4-point scale (*experienced, witnessed, heard of,* or *no exposure*). The total number of PTE types was computed by counting the number of self-experienced and witnessed events, yielding a score between 0 and 19. Principal component analysis of the HTQ on a large clinical sample of refugees by Knipscheer et al. (2015) showed that PTE items cluster into four separate domains: human right abuses (physical torture, threatened to be physically tortured, threatened to watch torturing, threatened to be executed, serious injury, lost or kidnapped, imprisonment), traumatic loss (murder of family member or friend, unnatural death of family member or friend, murder of stranger(s)), lack of basic human needs (lack of

shelter, lack of food or water, ill health without access to medical care), and separation from others (forced separation from family members, forced isolation from others). The number of PTE types within each domain was calculated in the same way as the total number of PTE types (potential ranges: 0-7 for human right abuses; 0-3 for traumatic loss and lack of basic human needs; 0-2 for separation from others).

5.2.3. STATISTICAL ANALYSES

Latent profile analysis (LPA) in MPlus version 8 (Muthén & Muthén, 1998-2017) was used to classify individuals into homogeneous latent subgroups based on the continuous measures of severity of psychopathology. The robust maximum likelihood estimator (MLR) was used which is robust to non-normality of observations. Full information maximum likelihood estimation was used to include participants with missing data. Complete data were available for 74.7% of the participants. Estimation of the covariances between the psychopathology scales was based on 75.8% to 92.3% of the data (mean = 82.8%). To simplify interpretation of the LPA results, scores on symptom measures were standardized into Z-scores. To avoid local likelihood maxima 1000 random sets of starting values in the first and 100 in the second step of optimization were requested and 50 initial stage iterations were used. A series of models with increasing numbers of latent subgroups were estimated until no acceptable model fit or substantive meaning was achieved (DiStefano & Kamphaus, 2006; Masyn, 2013). The model with the least number of latent subgroups with acceptable model fit and classification quality, as well as theoretical substantive meaning was selected as the most optimal solution. To compare models with different solutions the Bootstrapped Likelihood Ratio Test (BLRT), Lo-Mendell-Rubin adjusted likelihood ratio test (LMRA-LRT), and the Bayesian Information Criterion (BIC) were used. For the BLRT and LMRA-LRT, a significant p-value indicates that the estimated model fits the data better than the model with 1 subgroup less (Nylund, Asparouhov, & Muthén, 2007). Regarding BLRT, 500 bootstrap samples were requested with 50 sets of starting values in the first and 20 in the second step of optimization to avoid local likelihood maxima in each bootstrap sample. A lower value of BIC indicates a better fit of the model to the data (Van de Schoot et al., 2012). In LPA, the BLRT commonly yields a significant p-value and the lowest value of BIC is only reached in a highly complex model (Masyn, 2013). Therefore, diminishing gains in model fit according to the log-likelihood and BIC across models with an increasing number of subgroups were explored. When increasing the number of subgroups is starting to be accompanied by a diminishing gain in model fit this indicates a marginal gain in information. For this reason, it is likely that the minimal number of subgroups with substantive meaning and acceptable model fit is reached at this point (Masyn, 2013; Nylund et al., 2007). To evaluate the classification quality the entropy statistic was used, in combination with the average assignment probabilities. Classification is considered adequate when entropy values are >0.80 (Celeux & Soromenho, 1996). Mean differences in the symptom dimensions between the subgroups resulting from the LPA were tested using bootstrapped robust ANOVAs and post-hoc tests (Wilcox, 2017). This test was performed in R (version 3.1.0) using the WRS2 package. A 20% trimmed mean was used

for this analysis and 1000 bootstrap samples were requested. An explanatory measure of effect size ε as suggested by Wilcox and Tian (2011) was used, with values of ε = 0.10, 0.30, and 0.50 corresponding to small, medium, and large effect sizes respectively.

Subgroup membership was predicted by regressing the latent subgroups in the optimal solution on a set of observed predictor variables by conducting a series of multinomial logistic regression models using the three-step procedure in Mplus (Asparouhov & Muthén, 2014). The PTE domains of traumatic loss, lack of basic human needs, and separation from others were treated as categorical, because the potential range of these scores did not allow them to be treated as continuous. Using Helmert contrast coding, these were coded into two or three variables. By using Helmert contrasts each category of a categorical variable is compared to the mean of subsequent categories. The score regarding the PTE domain of human right abuses could be treated as continuous. The nominal region of origin variable was coded into two dummy variables in such a way that each category was compared to the reference category Middle East. Because data on the predictor variables were available for subsamples of different composition and MPlus handles missing values in the predictor variables with listwise deletion in this context, separate multinomial regression models were estimated for each of the predictor variables.

5.3 RESULTS

5.3.1. DESCRIPTIVE STATISTICS

Table 5.4 presents descriptive statistics of the symptom dimensions and predictor variables. The large majority of participants endorsed a clinical level of symptom severity with regard to PTSD, anxiety, and depression. This indicates that participants suffered multiple co-morbid symptom dimensions. Participants also indicated to have experienced and/or witnessed multiple PTE types (M = 13.88, SD = 4.55 PTE types) indicating that they were severely traumatized.

5.3.2. LATENT PROFILE ANALYSIS

Seven models with one to seven subgroups were tested with regard to six symptom dimensions (PTSD re-experiencing, PTSD avoidance, PTSD hyperarousal, anxiety, depression, and somatic complaints). Model fitting results and classification quality are summarized in Table 5.5. All models yielded significant *p*-values of the BLRT and decreasing BIC values, indicating a highly complex model with more than 7 subgroups as the optimal solution. LMRA-LRT yielded a non-significant *p*-value for model 5 and 7, indicating a model with 4 or 6 subgroups as the optimal solution. Since model fit indices did not clearly point to a single model as the most optimal solution and BLRT and BIC indicated a highly complex model as the optimal solution, gain in model fit according to the log-likelihood and BIC across models with increasing numbers of latent subgroups was explored and depicted in Figure 5.1.

The log-likelihood increased and BIC decreased substantially when moving from a model with one to two latent subgroups and from two to three latent subgroups. When moving from a model with three to four latent subgroups and across subsequent models with an increasing number of subgroups, there was a diminishing gain in log-likelihood and BIC. This indicates that the model with three latent subgroups (model 3) is the most parsimonious model – i.e., the model with the minimal number of latent subgroups with substantive meaning. The entropy value indicated adequate classification quality of this model. Entropy values of models with more than 3 latent subgroups were lower, indicating worse classification quality (Table 5.5). Adequate classification quality of model 3 was also supported by the average assignment probabilities for each individual latent subgroup: 0.882, 0.946, and 0.922 for the first, second, and third latent subgroup respectively.

Table 5.4. Descriptive statistics with regard to the symptom dimensions and predictor variables.

	N	Mean	Standard deviation	% in clinical range
PTSD: re-experiencing	1066	3.23	0.70	--
PTSD: avoidance	1056	2.85	0.61	--
PTSD: arousal	1064	3.20	0.63	--
PTSD: overall	1060	3.05	0.55	85.5
Anxiety symptoms	918	2.91	0.67	93.6
Depressive symptoms	912	2.92	0.62	95.2
Somatic complaints	980	68.77	17.30	--
Total number of PTE types	861	13.88	4.55	--
Number of PTE concerning human right abuses	861	4.80	2.12	--
Number of PTE concerning traumatic loss	861	2.20	1.04	--
Number of PTE concerning lack of basic human needs	861	2.09	1.08	--
Number of PTE concerning separation from others	861	1.48	0.75	--

Note: For some symptom dimensions the % of participants endorsing a clinical level of symptom severity could not be established because of the absence of a clinical cut-off value. PTSD = posttraumatic stress disorder. PTE = potentially traumatic events.

Table 5.5. Model fitting results and classification quality of the latent profile analysis.

Model	Entropy	BIC	Log-likelihood	BLRT		LMRA-LRT	
				-2LL difference	*P*	Value	*p*
1. One subgroup	1.000	17094.451	-8504.956	--	--	--	--
2. Two subgroups	0.843	15153.372	-7509.760	1990.393	< .001	1950.834	< .001
3. Three subgroups	**0.806**	**14423.262**	**-7120.047**	**779.425**	**< .001**	**763.934**	**< .001**
4. Four subgroups	0.786	14192.120	-6979.819	280.456	< .001	274.882	< .001
5. Five subgroups	0.800	14155.677	-6936.940	85.757	< .001	84.053	0.568
6. Six subgroups	0.720	14123.018	-6895.954	81.974	< .001	80.345	0.027
7. Seven subgroups	0.711	14107.129	-6863.352	65.203	< .001	63.907	0.1513

Note. Most meaningful model is printed in bold. BIC = Bayesian information criterion; BLRT = Parametric bootstrapped likelihood ratio test; -2LL difference = -2 times log-likelihood difference between a N class solution and N – 1 class solution; LMRA-LRT = Lo-Mendell-Rubin adjusted likelihood ratio test.

Figure 5.1. Gain in log-likelihood and BIC across LPA models with increasing numbers of latent subgroups.

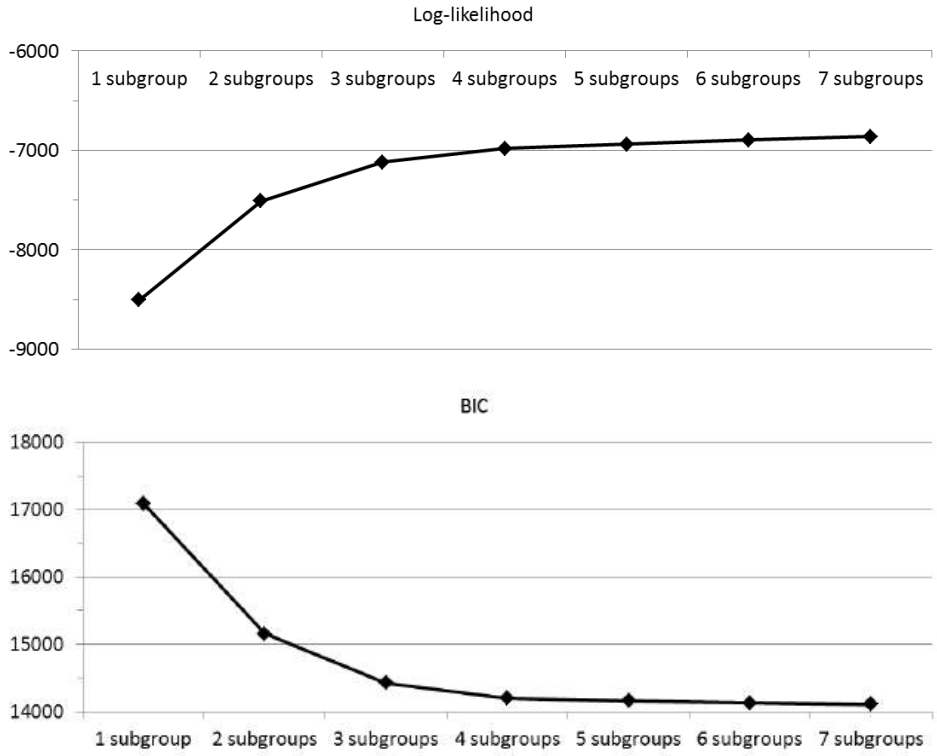


Figure 5.2 presents the standardized mean symptom severity on the symptom dimensions in each of the subgroups with regard to model 3, 4, 5, and 6. From a conceptual perspective model 3 was preferred over model 4 because the second and third subgroup in model 4 were very similar to the second subgroup in model 3. The division of the second subgroup in model 3 into two separate subgroups in model 4 was therefore deemed redundant. Although the third subgroup model 5 showed an interesting profile that deviates from the profiles of the other subgroups, model 3 was also preferred over model 5 because the size of the third subgroup in model 5 was negligible (i.e., N = 34, 3.0%). Finally, model 3 was preferred over model 6 because the fifth and sixth subgroup in model 6 were very similar to the third subgroup in model 3. The division of the third subgroup in model 3 into two separate subgroups in model 6 was therefore deemed redundant. Based on the criteria with regard to model fit, parsimony, classification quality, and theoretical meaning the model with three latent subgroups was retained.

Figure 5.2A shows that the first subgroup consists of 117 (10.2%) participants reporting the lowest symptom severity on all six symptom dimensions compared to participants in the second and third subgroup. The second subgroup includes 504 (43.9%) participants reporting intermediate levels of symptom severity compared to the first and third subgroup. The third

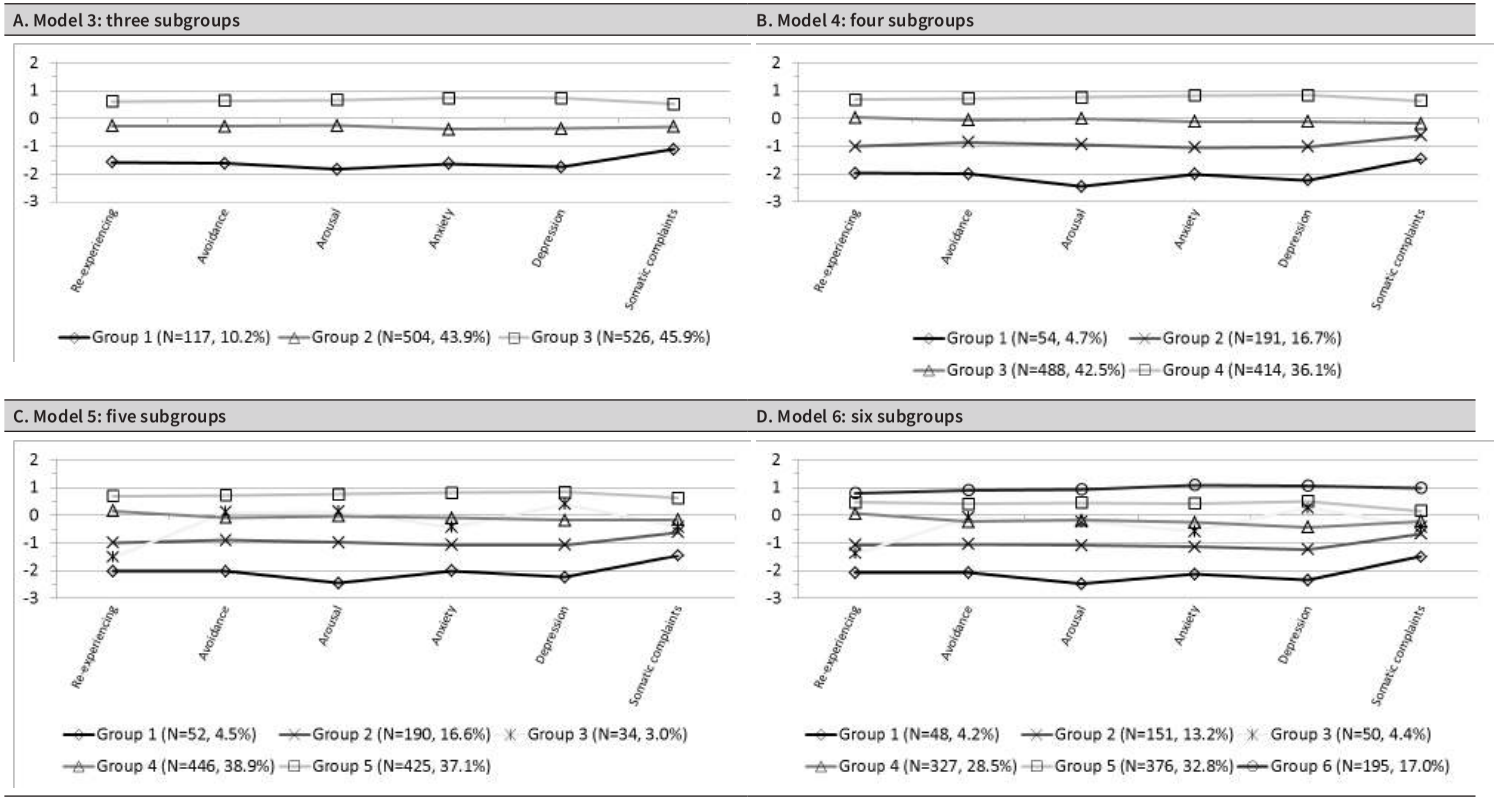
subgroup consists of 526 (45.9%) participants showing the most severe symptoms compared to the other subgroups. Results of the robust ANOVAs showed significant differences in symptom severity on all six symptom dimensions between the subgroups (*F* ranged between 230.40 and 704.06, all *p*-values < 0.001). The effect size on all symptom dimensions was large, with effect sizes ε ranging between 0.762 and 0.962. Results of post-hoc tests showed that participants in the first subgroup reported significantly lower symptom severity on all symptom dimensions compared to participants in the second and third subgroup (all *p*-values < 0.001). Participants in the second subgroup reported significantly lower symptom severity on all symptom dimension compared to participants in the third subgroup (all *p*-values < .001). In the first subgroup, a minority of the participants (4.5%) endorsed a clinical level of PTSD and 54.5% and 58.8% of the participants endorsed a clinical level of anxiety and depression. In the second subgroup, a large majority of the participants endorsed clinical levels of PTSD (89.6%), anxiety (96.4%), and depression (99.0%). In the third subgroup, all participants endorsed clinical levels of PTSD, anxiety, and depression. Based on these results, the subgroups were labelled the Moderate, Severe, and Highly Severe Symptoms subgroup respectively.

5.3.3. PREDICTORS OF SUBGROUPS

Descriptive statistics of the total number of PTE types, the number of PTE types within each trauma domain, region of origin, and gender within each of the subgroups are presented in Table 5.6. Results of the multinomial logistic regression analyses are presented in Table 5.7. The B coefficients (log odds) indicate how much more or less likely it becomes to be in one of the subgroups relative to the other subgroups, with every unit increase in the predictor variable. In the first and second model, the latent subgroups were regressed on the overall number of PTE types and the number of PTE types within the trauma domains respectively. In the third and fourth model, the latent subgroups were regressed on gender and region of origin.

The total number of PTE types differentiated significantly between all subgroups. Participants were respectively 2.59 and 1.58 times more likely to be in the Highly Severe Symptoms subgroup compared to the Moderate and Severe Symptoms subgroups with every additional PTE type. Likewise, they were 1.65 more likely to be in the Severe Symptoms subgroup compared to the Moderate Symptoms subgroup. PTE types within the human rights abuses domain differentiated significantly between the Moderate and Highly Severe Symptoms subgroups, as well as between the Severe and Highly Severe Symptoms subgroups. Participants were respectively 1.80 and 1.38 times more likely to be in the Highly Severe Symptoms subgroup compared to the Moderate and Severe Symptoms subgroups with every additional PTE type within the human right abuses domain. Subgroups did not differ in terms of the PTE type traumatic loss. PTE types within the domain of basic human needs differentiated significantly between subgroups. Participants were respectively 1.19 and 1.20 times more likely to be in the Severe and Highly Severe Symptoms subgroups compared to the Moderate Symptoms subgroup if they experienced one or multiple PTE types within the domain of lack of basic human needs.

Figure 5.2. Standardized mean scores on the symptom dimensions in each of the subgroups with regard to the models with 3, 4, 5, and 6 latent subgroups.



In addition, participants were 1.26 times more likely to be in the Severe Symptoms subgroup compared to the Moderate Symptoms subgroup if they experienced more than one PTE type within the domain of lack of basic human needs. Within the domain of separation from others, the number of PTEs differentiated significantly between the Moderate and Highly Severe Symptoms subgroups. Participants were 1.26 times more likely to be in the Highly Severe Symptoms subgroup if they experienced any event within this domain. Gender differentiated significantly between the Severe and Highly Severe symptoms subgroups, with females being 1.42 more likely to be in the Highly Severe Symptoms subgroup. Region of origin did not differentiate significantly between any of the subgroups.

Table 5.6. Descriptive statistics of the predictor variables within subgroups.

	Moderate symptoms subgroup			Severe symptoms subgroup			Highly severe symptoms subgroup		
	N	M	SD	N	M	SD	N	M	SD
Traumatic event types									
Total number	96	10.98	5.49	376	13.42	4.47	389	15.04	3.94
Human right abuses	96	3.67	2.50	376	4.60	2.15	389	5.27	1.84
	N	%		N	%		N	%	
Traumatic loss									
0 event types	19	19.8		52	13.8		26	6.7	
1 event type	15	15.6		47	12.5		45	11.6	
2 event types	21	21.9		85	22.6		82	21.1	
3 event types	41	42.7		192	51.1		236	60.7	
Lack of basic human needs									
0 event types	26	27.1		51	13.6		39	10.0	
1 event type	21	21.9		53	14.1		47	12.1	
2 event types	19	19.8		94	25.0		81	20.8	
3 event types	30	31.3		178	47.3		222	57.1	
Separation from others									
0 event types	30	31.3		65	17.3		42	10.8	
1 event type	18	18.8		79	21.0		80	20.6	
2 event types	48	50.0		232	61.7		267	68.6	
Gender									
Male	82	70.1		370	73.4		355	67.5	
Region of origin									
Middle East	68	63.6		290	62.9		294	63.2	
Sub-Saharan Africa	18	16.8		76	16.5		77	16.6	
Balkan Europe	21	19.6		95	20.6		94	20.2	

Table 5.7. Results of the multinomial regression analysis of symptom severity subgroups on the number of potential traumatic event types, gender, and region of origin.

	Moderate symptoms subgroup						Severe symptoms subgroup		
	Vs. Severe symptoms subgroup			Vs. Highly severe symptoms subgroup			Vs. Highly severe symptoms subgroup		
	B	SE	CI	B	SE	CI	B	SE	CI
Traumatic event types									
Total number	0.50*	0.13	0.25 to 0.75	0.95*	0.13	0.70 to 1.20	0.46*	0.10	0.26 to 0.66
Human right abuses	0.27	0.15	-0.02 to 0.56	0.59*	0.14	0.32 to 0.86	0.32*	0.11	0.10 to 0.54
Traumatic loss									
0 versus 1,2 & 3 event types	-0.04	0.09	-0.22 to 0.14	0.12	0.10	-0.08 to 0.32	0.16	0.09	-0.02 to 0.34
1 versus 2 & 3 event types	0.06	0.13	-0.19 to 0.31	0.06	0.13	-0.19 to 0.31	0.00	0.09	-0.18 to 0.18
2 versus 3 event types	-0.03	0.17	-0.36 to 0.30	0.04	0.16	-0.27 to 0.35	0.07	0.12	-0.17 to 0.31
Lack of basic human needs									
0 versus 1,2 & 3 event types	0.17*	0.08	0.01 to 0.33	0.18*	0.08	0.02 to 0.34	0.01	0.08	-0.15 to 0.17
1 versus 2 & 3 event types	0.23*	0.12	-0.01 to 0.47	0.20	0.11	-0.02 to 0.42	-0.03	0.09	-0.21 to 0.15
2 versus 3 event types	0.18	0.18	-0.17 to 0.53	0.18	0.18	-0.17 to 0.53	0.13	0.12	-0.11 to 0.37
Separation from others									
0 versus 1 & 2 event types	0.15	0.11	-0.07 to 0.37	0.23*	0.11	0.01 to 0.45	0.08	0.10	-0.12 to 0.28
1 versus 2 event types	-0.18	0.19	-0.55 to 0.19	-0.27	0.18	-0.62 to 0.08	-0.10	0.13	-0.35 to 0.15
Gender									
Female vs. male	-0.21	0.25	-0.70 to 0.28	0.14	0.24	-0.33 to 0.61	0.35*	0.17	0.02 to 0.68
Region of origin									
Middle East vs. Sub-Saharan Africa	-0.01	0.33	-0.66 – 0.64	-0.01	0.31	-0.62 to 0.60	0.00	0.22	-0.43 to 0.43
Middle East vs. Balkan Europe	0.07	0.31	-0.54 – 0.68	0.04	0.29	-0.53 to 0.61	-0.03	0.20	-0.42 to 0.36

Note: $^{*}p < .05$; CI = 95% confidence interval of regression coefficient B.

5.4 DISCUSSION

To our knowledge, this is the first LPA-study investigating subgroups based on a broad range of symptoms of psychopathology in a large sample of treatment-seeking, severely traumatized refugees. Using LPA, three distinct subgroups were identified reflecting moderate, severe, and highly severe levels of co-occurring symptoms of psychopathology. These findings extend previous studies documenting subgroups based on symptom severity in civilian, military, and refugee populations across PTSD symptoms and sometimes co-morbid symptoms (see e.g., Armour et al., 2015; Au et al., 2013; Contractor et al., 2015; Jongedijk et al., 2019; Minihan et al., 2018).

Differences between the subgroups could completely be characterized by differences in symptom severity with regard to the PTSD symptom clusters re-experiencing, avoidance, and arousal, as well as anxiety, depression and somatization symptoms. The absence of qualitative differences between the subgroups (e.g., severe symptoms on a specific symptom domain and less severe symptoms on other domains) supports the proposition that severely traumatized individuals exhibit a broad and general posttraumatic stress response with a variety of mental health symptoms of which PTSD-symptoms represent only one element.

Prior studies examining psychopathology profiles among refugees yielded mixed results, with both quantitative and qualitative differences between subgroups (see Table 5.2). However, all these studies were conducted using community samples with non-patient participants, and not a treatment-seeking sample as in our study. Treatment seeking individuals show important differences in characteristics compared to non-patients. Particularly at lower levels of PTSD severity, classes with predominant PTSD severity and predominant depression severity were found to be distinct (Contractor et al., 2017). Furthermore, a prior study showed that PTSD and depression are separate entities in the earlier phases post-trauma whereas the distinction between the two becomes less clear as symptomatology becomes more chronic (O'Donnell et al., 2004).

More specifically, patients exhibiting severe and long-lasting psychopathology suffer from subsequent distress that is not only caused by the experienced PTEs, but also the disabling long-lasting mental health problems and resulting psychosocial dysfunctions. In particular refugees face significant post-migration, displacement-related stressors that have a significant negative influence on mental health problems (Carswell et al., 2011; Miller & Rasmussen, 2017; Minihan et al., 2018). Because exposure to past PTEs brings about increased and enhanced sensitivity to post-trauma stressors (Smid et al., 2018), enduring trauma-related mental health problems combined with lasting displacement-related stressors will cause a gradual decline of adaptive psychosocial and health related functioning and will lead to a broad mix of general psychiatric symptoms and disorders instead of clearly distinguishable diagnostic classifications (Au et al., 2013; Armour et al., 2015; Jongedijk et al., 2019).

Although we measured a broad spectrum of comorbid psychopathology next to PTSD, some potentially important symptom dimensions were not taken into account, including

affective dysregulation, dissociation, prolonged grief, and personality dimensions. As stated by some authors, PTSD, anxiety and depression may have common underlying factors (e.g., Watson et al., 2011). This may be the reason why symptoms of PTSD, anxiety and depression cohere together tightly. The inclusion of other symptom dimensions might have led to the identification of subgroups differing in a more qualitative manner.

This study also aimed to identify whether exposure to PTE types predicts subgroup membership taking into account research evidence that a higher level of exposure to PTEs is associated with long-term psychiatric morbidity in refugees (Bogic et al., 2012; Knipscheer et al., 2015; Minihan et al., 2018). PTSD shows a 'building block' effect: exposure to PTEs is cumulative, contributing to the risk of developing PTSD and to the severity of PTSD over time in a 'dose-dependent' manner (Mollica et al., 1998; Schauer et al., 2003; Wilker et al., 2015). Refugees in our study experienced high numbers of PTE types. Results were as expected: participants in the Severe and in the Highly Severe Symptoms subgroup reported a larger number of PTE types compared to participants in the Moderate Symptoms subgroup. Moreover, our results indicated that symptom profiles were associated with specific domains of PTEs. This is in line with previous studies in non-refugee (Contractor et al., 2018; O'Donnell et al., 2017) and refugee populations (Nickerson et al., 2011). Participants reporting more PTEs regarding human right abuses were more likely to be in the Highly Severe Symptoms subgroup than those who reported less PTEs within this domain. Traumatic loss did not differentiate between the subgroups. It is possible that experiences with loss precipitate other symptoms instead of those related to PTSD, anxiety, depression or somatization, such as symptoms of prolonged grief disorder (Djelantik et al., 2019; Nickerson et al., 2014). Participants reporting PTEs regarding lack of human needs were more often in the Severe and Highly Severe Symptom subgroups. This domain is defined by a lack of material kind of needs, which, together with social support during and after traumatic situations, is an important factor influencing the course of mental health symptoms in refugees (Schweitzer et al., 2006).

Based on country of origin, three separate geographic regions of origin were defined. However, they did not differentiate with regard to the severity subgroups. Maybe region of origin is not an appropriate way to categorize character and severity of conflict. Within each region, different countries may have different kinds of conflicts and wars and, hence, a substantial difference in PTE types. For example, a previous study demonstrated that within one region, in our study defined as 'Middle East and North Africa', respondents from Iran had a higher risk for PTSD and depression/anxiety compared to respondents from Afghanistan and Somalia (Gerritsen et al., 2006). Cultural differences within and between the geographic regions possibly also play a role in the presentation of mental health complaints. Furthermore, patients from different cultures can be faced with different acculturation problems and confusion of cultural identity, which are risk factors for mental health problems (Groen et al., 2019). This means that several other factors related to region of origin might play a role in developing psychopathology and that region of origin as such is insufficiently specific.

Previous studies in different populations, including refugees, showed that women had higher

risks for developing PTSD and comorbid disorders (Cao et al., 2015; Gerritsen et al., 2006; Olff et al., 2007; Tolin & Foa, 2006; Zhen et al., 2018). In our study, we demonstrated that female refugee participants were significantly more often included in the Highly Severe Symptom subgroup than in the Severe Symptoms subgroup. This suggests that women not only have more chance to develop PTSD and comorbid symptomatology, but also suffer more severe symptoms.

5.4.1. STRENGTHS, LIMITATIONS, AND FUTURE RESEARCH

This is the first LPA-study to identify subgroups in a sample of refugees based on their scores on indices of PTSD and other forms of psychopathology. Strengths of this study are that it relied on a large sample of refugees from a wide range of countries, increasing the generalization of the findings. Moreover, a broad range of psychopathology was taken into account, which allowed us to examine overall symptom severity, rather than examining specific categorical diagnoses. However, as the participants were referred to a highly specialized trauma treatment center, the findings are confined to individuals experiencing clinically significant distress and having long-lasting symptoms. Furthermore, we did not investigate the specific influence of potentially traumatic events that were not related to the refugee status, like e.g., early childhood trauma. Another limitation is that we measured PTSD-symptoms in keeping with DSM-IV criteria instead of DSM-5 criteria. Therefore the findings lack some of the symptoms related to the DSM-5 criterion 'negative alterations in cognitions and mood' that are not represented in DSM-IV (APA, 1994; 2013). Because these particular symptoms overlap with symptoms captured by depression and negative affect, which is an underlying factor of PTSD, anxiety, and depression (Contractor et al., 2017), we do not expect that different subgroups would be identified when PTSD-symptoms would be assessed in accord with DSM-5. However, future research is needed to examine that.

This study is a cross-sectional study. In a longitudinal study more information can be obtained about temporal relations between PTEs, subsequent psychopathology, and factors of post-migration distress. More specific, investigating the interactive degree to which participants were exposed to ongoing stressors in daily life, including psychological symptoms and post-migration distress is recommended for future studies.

5.4.2. CLINICAL IMPLICATIONS

The findings that there are symptom severity subgroups and that they are based on a general and broad range of psychopathology underscores the value of re-conceptualizing psychopathology in severely traumatized patients into a broadened framework of a posttraumatic stress response continuum. Clinicians should not only focus on PTSD-symptoms but also address comorbid mental disorders and symptoms. In addition, the description of PTSD subgroups along the continuum of severity may play an important role in classifying traumatized patients, as is the case for depressive disorders in the DSM-5 (APA, 2013).

Focusing on a broadened concept of the posttraumatic stress symptoms as a continuum with severity subgroups may be of importance in identifying individuals at risk. Merely screening for PTSD or any other specific diagnostic disorder will lead to underreporting mental

health care problems and difficulties in detecting individuals that are at risk for developing mental health problems, or maybe need treatment. Considering our and prior findings (Contractor et al., 2018; Gerritsen et al., 2006; O'Donnell et al., 2017), this seems especially important in individuals with a high PTE load in their history and individuals with higher symptom severity profiles. They are at risk of poorer general health outcomes and higher health related functional impairment (Armour et al., 2015; Au et al., 2013; Minihan et al., 2018).

High symptom severity is associated with poorer treatment outcome in comparison with less symptom severity in refugee patients with trauma-related mental disorders and high levels of comorbid depression (Haagen et al., 2017). For these refugees with often a broad range of mental health problems, treatment modifications may be needed to enhance treatment effectiveness. Patients with more severe symptoms in particular may need a more intensified treatment including broader cognitive and behavioral interventions in addition to interventions focused on trauma processing. This may reduce severity of comorbid symptoms and enhance overall psychosocial functioning. Some authors recommend looking beyond diagnostic criteria and to treat the common underlying mechanisms like 'negative affect' by using transdiagnostic treatment interventions (Contractor et al., 2017; Minihan et al., 2018). As avoidant coping is supposed to be associated with high symptom severity (Badour et al., 2012; Jongedijk et al., 2019), intensifying trauma focused therapy with treatment sessions even twice a day during one or two weeks may help to overcome avoidance and foster recovery (Zepeda Méndez et al., 2018).

The finding that symptom severity levels were represented by a broad variety of co-morbid symptoms could mean that targeting only distinct disorders will not be appropriate and more integrated treatment programs will be needed. It is recommended to offer in addition to the usual evidence-based therapies a more personalized and integrated treatment program based on symptom severity, comorbidity, functional impairments, resources and needs, and specific distress related predictors for general health problems (Haagen et al., 2017; Minihan et al., 2018; Sonne et al., 2016). In displaced populations, psychological distress is related to both ongoing daily stressors and living difficulties and to prior war experiences (Miller & Rasmussen, 2017). Indeed, several studies have shown that post-migration stressors in the recipient country are associated with long-term psychiatric morbidity (Bogic et al., 2012; Laban et al., 2004; Minihan et al, 2018; Schweizer et al., 2006). These findings clearly indicate that post-trauma and post-migration stressors are of major importance to health related functioning and hence need to be addressed in a comprehensive treatment program for traumatized refugees.

AUTHOR CONTRIBUTION

RJ: conceptualization, methodology, formal analysis, writing – original draft
DE: formal analysis, writing – review and editing
NvdA: methodology, formal analysis, data curation, writing – review and editing
RK: writing – review and editing, supervision
PB: writing – review and editing, supervision

REFERENCES

American Psychiatric Association, APA (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

American Psychiatric Association, APA (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author.

Armour, C., Contractor, A., Elhai, J.D., Stringer, M., Lyle, G., Forbes, D., & Richardson, J.D. (2015). Identifying latent profiles of posttraumatic stress and major depression symptoms in Canadian veterans: Exploring differences across profiles in health-related functioning. *Psychiatry Research, 228*, 1-7. doi:10.1016/j.psychres.2015.03.011

Armour, C., Elklit, A., Lauterbach, D., & Eihai, J.D. (2014). The DSM-5 dissociative-PTSD subtype: can levels of depression, anxiety, hostility, and sleeping difficulties differentiate between dissociative-PTSD and PTSD in rape and sexual assault victims? *Journal of Anxiety Disorders, 28*, 418-426. doi:10.1016/j.janxdis.2013.12.008

Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: three-step approaches using Mplus. S*tructural Equation Modeling: A Multidisciplinary Journal, 21*. doi:10.1080/10705511.2014.915181

Au, T.M., Dickstein, B.D., Comer, J.S., Salters-Pedneault, K., & Litz, B.T. (2013). Co-occurring posttraumatic stress and depression symptoms after sexual assault: a latent profile analysis. *Journal of Affective Disorders*, *149*, 209-216. doi:10.1016/j.jad.2013.01.026

Badour, C. L., Blonigen, D. M., Boden, M. T., Feldner, M. T., & Bonn-Miller, M. O. (2012). A longitudinal test of the bi-directional relations between avoidance coping and PTSD severity during and after PTSD treatment. *Behaviour Research and Therapy*, *50*(10), 610-616. doi:10.1016/j.brat.2012.06.006

Bogic, M., Ajdukovic, D., Bremner, S., Franciskovic, T., Galeazzi, G.M., Kucukalic, A., Lecic-Tosevski, D., Morina, N., Popovski, M., Schutzwohl, M., Wang, D. L., & Priebe, S. (2012). Factors associated with mental disorders in long-settled war refugees: refugees from the former Yugoslavia in Germany, Italy and the UK. *The British Journal of Psychiatry*, *200*(3), 216-223. doi:10.1192/bjp.bp.110.084764

Carswell, K., Blackburn, P., & Barker, C. (2011). The relationship between trauma, post-migration problems and the psychological well-being of refugees and asylum seekers. *International Journal of Social Psychiatry*, *57*(2), 107-119. doi:10.1177/0020764009105699

Cao, X., Wang, L., Cao, C., Zhang, J., Liu, P., Zhang, B., ... & Elhai, J. D. (2015). Patterns of DSM-5 posttraumatic stress disorder and depression symptoms in an epidemiological sample of Chinese earthquake survivors: a latent profile analysis. *Journal of Affective Disorders*, *186*, 58-65. doi:10.1016/j.jad.2015.06.058

Caspi, A., Houts, R. M., Belsky, D. W., Goldman-Mellor, S. J., Harrington, H., Israel, S., Meier, M. H., Ramrakha, S., Shalev, I., Poulton, R., & Moffitt, T. E. (2014). The p factor: one general psychopathology factor in the structure of psychiatric disorders?. *Clinical Psychological Science*, *2*(2), 119-137. doi:10.1177/2167702613497473

Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification*, *13*(2), 195-212. doi:10.1007/BF01246098

Conrad, D., Wilker, S., Pfeiffer, A., Lingenfelder, B., Ebalu, T., Lanzinger, H., ... & Kolassa, S. (2017). Does trauma event type matter in the assessment of traumatic load?. *European Journal of Psychotraumatology*, *8*, 1344079. doi:10.1080/20008198.2017.1344079

Contractor, A.A., Elhai, J.D., Fine, T.H., Tamburrino, M.B., Cohen, G., Shirley, E., Chan, P.K., Liberzon, I., Galea, S., & Calabrese, J.R. (2015). Latent profile analyses of posttraumatic stress disorder, depression and generalized anxiety disorder symptoms in trauma-exposed soldiers. *Journal of Psychiatric Research*, *68*, 19-26. doi:10.1016/j.jpsychires.2015.05.014

Contractor, A.A., Roley-Roberts, M.E., Lagdon, S., & Armour, C. (2017). Heterogeneity in patterns of DSM-5 posttraumatic stress disorder and depression symptoms: latent profile analyses. *Journal of Affective Disorders*, *212*, 17-24. doi:10.1016/j.jad.2017.01.029

Contractor, A. A., Caldas, S., Fletcher, S., Shea, M. T., & Armour, C. (2018). Empirically derived lifespan polytraumatization typologies: a systematic review. *Journal of Clinical Psychology, 74(7)*, 1137-1159. doi:10.1002/jclp.22586

Crumlish, N., & O'Rourke, K. (2010). A systematic review of treatments for post-traumatic stress disorder among refugees and asylum-seekers. *The Journal of Nervous and Mental Disease, 198*(4), 237-251. doi:10.1097/NMD.0b013e3181d61258

Dalenberg, C J., Glaser, D., & Alhassoon, O.M. (2012). Statistical support for subtypes in posttraumatic stress disorder: The how and why of subtype analysis. *Depression and Anxiety*, *29*(8), 671-678. doi:10.1002/da.21926

DiStefano, C., & Kamphaus, R.W. (2006). Investigating subtypes of child development: a comparison of cluster analysis and latent class cluster analysis in typology creation. *Educational and*

Psychological Measurement, 66(5), 778–794. doi:10.1177/0013164405284033

Djelantik, A. M. J., Robinaugh, D. J., Kleber, R. J., Smid, G. E., & Boelen, P. A. (2019). Symptomatology following loss and trauma: latent class and network analyses of prolonged grief disorder, posttraumatic stress disorder, and depression in a treatment-seeking trauma-exposed sample. *Depression and Anxiety*, 1–9. doi:10.1002/da.22880

Elklit, A., Hyland, P., & Shevlin, M. (2014). Evidence of symptom profiles consistent with posttraumatic stress disorder and complex posttraumatic stress disorder in different trauma samples. *European Journal of Psychotraumatology, 5.* doi:10.3402/ejpt.v5.24221

Fazel, M., Wheeler, J., & Danesh, J. (2005). Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. *The Lancet, 365*(9467), 1309-1314. doi:10.1016/S0140-6736(05)61027-6

Gerritsen, A.A., Bramsen, I., Devillé, W., van Willigen, L.H.M., Hovens, J.E., & van der Ploeg, H.M. (2006). Physical and mental health of Afghan, Iranian and Somali asylum seekers and refugees living in the Netherlands. *Social Psychiatry and Psychiatric Epidemiology, 41*(1), 18-26. doi:10.1007/s00127-005-0003-5

Gijsbers van Wijk, C.M.T. & Kolk, A.M. (1996). Psychometric evaluation of symptom perception related measures. *Personality and Individual Differences, 20(1)*, 55-70.

Groen, S. P., Richters, A. J., Laban, C. J., van Busschbach, J. T., & Devillé, W. L. (2019). Cultural Identity Confusion and Psychopathology: A Mixed-Methods Study Among Refugees and Asylum Seekers in the Netherlands. *The Journal of Nervous and Mental Disease*, *207*(3), 162. doi:10.1097/NMD.0000000000000935

Haagen, J. F., Ter Heide, F. J. J., Mooren, T. M., Knipscheer, J. W., & Kleber, R. J. (2017). Predicting post-traumatic stress disorder treatment response in refugees: Multilevel analysis. *British Journal of Clinical Psychology*, *56*(1), 69-83. doi:10.1111/bjc.12121

Hollifield, M., Warner, T. D., Lian, N., Krakow, B., Jenkins, J.H., Kesler, J., Stevenson, J., & Westermeyer, J. (2002). Measuring trauma and health status in refugees: a critical review. *Journal of the American Medical Association*, *288*(5), 611-621. doi:10.1001/jama.288.5.611

Hruska, B., Irish, L. A., Pacella, M. L., Sledjeski, E. M., & Delahanty, D. L. (2014). PTSD symptom severity and psychiatric comorbidity in recent motor vehicle accident victims: A latent class analysis. *Journal of Anxiety Disorders*, *28*, 644-649. doi:10.1016/j.janxdis.2014.06.009

Jongedijk, R.A., van der Aa, N., Haagen, J.F., Boelen, P.A., & Kleber, R.J. (2019). Symptom severity in PTSD and comorbid psychopathology: a latent profile analysis among traumatized veterans. *Journal of Anxiety Disorders*, *62*, 35-44. doi:10.1016/j.janxdis.2018.11.004.

Kleijn, W.C., Hovens, J.E., & Rodenburg, J.J. (2001). Posttraumatic stress symptoms in refugees: assessments with the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist-25 in different languages. *Psychological Reports*, *88*(2), 527-532. doi:10.2466/pr0.2001.88.2.527

Knipscheer, J.W., Sleijpen, M., Mooren, T., ter Heide, J.J., & van der Aa, N. (2015). Trauma exposure and refugee status as predictors of mental health outcomes in treatment-seeking refugees. *BJ Psychiatric Bulletin*, 1-4. doi:10.1192/pb.bp.114.047951

Laban, C.J., Gernaat, H.B., Komproe, I.H., Schreuders, B.A., & De Jong, J.T. (2004). Impact of a long asylum procedure on the prevalence of psychiatric disorders in Iraqi asylum seekers in The Netherlands. *The Journal of Nervous and Mental Disease*, *192*(12), 843-851. doi:10.1097/01.nmd.0000146739.26187.15

Lavik, N.J., Hauff, E., Solberg, Ø., & Laake, P. (1999). The use of self-reports in psychiatric studies of traumatized refugees: validation and analysis of HSCL-25. *Nordic Journal of Psychiatry, 53*(1), 17-20. doi:10.1080/080394899426666

Masyn, K.E. (2013). *Latent class analysis and finite mixture modeling*. In T. D. Little (ed.). The Oxford handbook of quantitative methods, volume 2: Statistical analysis. Oxford: University Press.

Miller, K. E., & Rasmussen, A. (2017). The mental health of civilians displaced by armed conflict: an ecological model of refugee distress. *Epidemiology and Psychiatric Sciences*, *26*(2), 129-138. doi:10.1017/S2045796016000172

Minihan, S., Liddell, B.J., Byrow, Y., Bryant, R.A., & Nickerson, A. (2018). Patterns and predictors of posttraumatic stress disorder in refugees: a latent class analysis. *Journal of Affective Disorders, 232*, 252-259. doi:10.1016/j.jad.2018.02.010

Mollica, R.F., Caspi-Yavin, Y., Bollini, P., Truong, T., Tor, S., & Lavelle, J. (1992). The Harvard Trauma Questionnaire: validating a cross-cultural instrument for measuring torture, trauma, and posttraumatic stress disorder in Indochinese refugees. *The Journal of Nervous and Mental Disease, 180*(2), 111-116. doi:10.1097/00005053-199202000-00008

Mollica, R. F., Caspi-Yavin, Y., Lavelle, J., Tor, S., Yang, T., Chan, S., Pham, T., Ryan, A., & de Marneffe, D. (1996a). The Harvard Trauma Questionnaire (HTQ): Manual Cambodian, Loatian and Vietnamese versions. *Torture, 1*, 21-33.

Mollica, R.F., Wyshak, G., de Marneffe, T., Tu, B., Yang, T.,

Khuon, F., Coelho, R., & Lavelle, J. (1996b). Hopkins Symptom Checklist (HSCL-25): Manual Cambodian, Laotian and Vietnamese versions. *Torture, 1*, 35-42.

Mollica, R., McInnes, K., Poole, C., & Tor, S. (1998). Dose effect relationship of trauma to symptoms of depression and PTSD among Cambodian survivors of mass violence. *British Journal of Psychiatry, 173*, 482-488. doi:10.1192/bjp.173.6.482

Momartin, S., Silove, D., Manicavasagar, V., Steel, Z. (2004). Comorbidity of PTSD and depression: associations with trauma exposure, symptom severity and functional impairment in Bosnian refugees resettled in Australia. *Journal of Affective Disorders, 80*, 231-238. doi:10.1016/S0165-0327(03)00131-9

Muthén, L.K. & Muthén, B.O. (1998-2017). *MPlus User's Guide. Eigth Edition.* Los Angeles, CA: Muthén & Muthén.

Nickerson, A., Bryant, R. A., Silove, D., & Steel, Z. (2011). A critical review of psychological treatments of posttraumatic stress disorder in refugees. *Clinical Psychology Review, 31*(3), 399-417. doi:0.1016/j.cpr.2010.10.004

Nickerson, A., Liddell, B.J., Maccallum, F., Steel, Z., Silove, D., & Bryant, R.A. (2014). Posttraumatic stress disorder and prolonged grief in refugees exposed to trauma and loss. *BMC Psychiatry*, *106*(14). doi:10.1186/1471-244X-14-106

Nylund, K., Asparouhov, T., Muthén, B.O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(4), 535-569. doi:10.1080/10705510701575396

O'Donnell, M. L., Creamer, M., & Pattison, P. (2004). Posttraumatic stress disorder and depression following trauma: understanding comorbidity. *American Journal of Psychiatry*, *161*(8), 1390-1396. doi:10.1176/appi.ajp.161.8.1390

O'Donnell, M. L., Schaefer, I., Varker, T., Kartal, D., Forbes, D., Bryant, R. A., ... & Felmingham, K. (2017). A systematic review of person-centered approaches to investigating patterns of trauma exposure. *Clinical Psychology Review, 57*, 208-225. doi:10.1016/j.cpr.2017.08.009

Olff, M. (2017). Sex and gender differences in post-traumatic stress disorder: an update. *European Journal of Psychotraumatology*, *8*(sup4). doi:10.1080/20008198.2017.1351204

Olff, M., Langeland, W., Draijer, N., & Gersons, B.P.R. (2007). Gender differences in posttraumatic stress disorder. *Psychological Bulletin, 133*(2), 183. doi:10.1037/0033-2909.133.2.183

Palic, S., & Elklit, A. (2011). Psychosocial treatment of posttraumatic stress disorder in adult refugees: A systematic review of prospective treatment outcome studies and a critique. *Journal of Affective Disorders, 131*, 8-23. doi:10.1016/j.jad.2010.07.005

Pennebaker, J.W. (1982). *The Psychology of Physical Symptoms*. New York: Springer-Verlag.

Roberts, B., Ocaka, K. F., Browne, J., Oyok, T., Sondorp, E. (2008). Factors associated with post-traumatic stress disorder and depression amongst internally displaced persons in northern Uganda. *BMC Psychiatry*, 8:38. doi:10.1186/1471-244X-8-38

Rohlof, H.G., Knipscheer, J.W., & Kleber, R.J. (2014). Somatization in refugees: a review. *Social Psychiatry and Psychiatric Epidemiology, 49*, 1793-1804. doi:10.1007/s00127-014-0877-1

Schauer, M., Neuner, F., Karunakara, U., Klaschik, C., Robert, C., & Elbert, T. (2003). PTSD and the building block effect of psychological trauma among West Nile Africans. *European Society for Traumatic Stress Studies Bulletin*, *10*(2), 5-6.

Schoot, van de R., Lugtig, P., & Hox, J. (2012) Developmetrics: A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, *9*(4), 486-492. doi:10.1080/17405629.2012.686740

Schweitzer, R., Melville, F., Steel, Z., & Lacherez, P. (2006). Trauma, post-migration living difficulties, and social support as predictors of psychological adjustment in resettled Sudanese refugees. *Australian & New Zealand Journal of Psychiatry*, *40*(2), 179-187. doi:10.1080/j.1440-1614.2006.01766.x

Slobodin, O., & de Jong, J.T. (2015). Mental health interventions for traumatized asylum seekers and refugees: what do we know about their efficacy? *International Journal of Social Psychiatry*, *61*(1), 17-26. doi:10.1177/0020764014535752

Smid, G. E., Kleber, R. J., Rademaker, A. R., van Zuiden, M., & Vermetten, E. (2013). The role of stress sensitization in progression of posttraumatic distress following deployment. *Social Psychiatry and Psychiatric Epidemiology*, *48*, 1743-1754. doi:10.1007/s00127-013-0709-8

Sonne, C., Carlsson, J., Bech, P., Vindbjerg, E., Mortensen, E. L., & Elklit, A. (2016). Psychosocial predictors of treatment outcome for trauma-affected refugees. *European Journal of Psychotraumatology*, *7*(1). doi:10.3402/ejpt.v7.30907

Stander, V. A., Thomsen, C. J., & Highfill-McRoy, R. M. (2014). Etiology of depression comorbidity in combat-related PTSD: a review of the literature. *Clinical Psychology Review*, *34*(2), 87-98. doi:10.1016/j.cpr.2013.12.002

Steel, Z., Chey, T. Silove, D. Marnane, C., Bryant, R.A., Ommeren, van M. (2009). Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *Journal of the American*

Medical Association, 302(5), 537-549. doi:10.1001/jama.2009.1132.

Tay, A. K., Rees, S., Chen, J., Kareth, M., & Silove, D. (2015). The coherence and correlates of intermittent explosive disorder amongst West Papuan refugees displaced to Papua New Guinea. *Journal of Affective Disorders*, *177*, 86-94. doi:10.1016/j.jad.2015.02.009

Tolin, D.F., & Foa, E.B. (2006). Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. *Psychological Bulletin, 132(6),* 959. doi:10.1037/1942-9681.S.1.37

Turner, S. (2015). Refugee blues: a UK and European perspective. *European Journal of Psychotraumatology*, *6*. doi:10.3402/ejpt.v6.29328

UNHCR (UN High Commissioner for Refugees) (2017). *UNHCR Global Trends in Forced Displacement 2017*. Retrieved from https://www.unhcr.org/globaltrends2017/

Watson, D., Clark, L.A., & Stasik, S.M. (2011). Emotions and the emotional disorders: A quantitative hierarchical perspective. *International Journal of Clinical and Health Psychology*, *11*(3), 429-442.

Wilcox, R.R. (2017). *Introduction to robust estimations & hypothesis testing. 4th edition.* Elsevier, Amsterdam, The Netherlands.

Wilcox, R. R., & Tian, T. S. (2011). Measuring effect size: a robust heteroscedastic approach for two or more groups. *Journal of Applied Statistics*, *38*(7), 1359-1368. doi:10.1080/02664763.2010.498507

Wilker, S., Pfeiffer, A., Kolassa, S., Koslowski, D., Elbert, T., & Kolassa I.T. (2015). How to quantify exposure to traumatic stress? Reliability and predictive validity of measures for cumulative trauma exposure in a post-conflict population. *European Journal of Psychotraumatology, 6.* doi:10.3402/ejpt.v6.28306

Wind, T.R., Van der Aa, N., De la Rie, S., & Knipscheer, J. (2017). The assessment of psychopathology among traumatized refugees: measurement invariance of the Harvard Trauma Questionnaire and the Hopkins Symptom Checklist-25 across five linguistic groups. *European Journal of Psychotraumatology, 8*(sup2). doi:10.1080/20008198.2017.1321357

Zepeda Méndez, M., Nijdam, M. J., ter Heide, F. J. J., van der Aa, N., & Olff, M. (2018). A five-day inpatient EMDR treatment programme for PTSD: Pilot study. *European Journal of Psychotraumatology*, *9*(1). doi:10.1080/20008198.2018.1425575

Zhen, R., Quan, L., & Zhou, X. (2018). Co-occurring patterns of post-traumatic stress disorder and depression among flood victims: a latent profile analysis. *Journal of Health Psychology*, *25*, 1543-1555. doi:10.1177/1359105318763505

'Diagnoses do not carve nature at her joints (...). Unfortunately, clinical psychology and psychiatry have devoted most of their resources to studying the diagnostic labels that summarize the complex mental health states of people (…).' [12]

12 Retrieved from p. 501: Fried, E. I. (2022). Studying mental health problems as systems, not syndromes. *Current Directions in Psychological Science*, *31*(6), 500-508.

Associations between PTSD criteria and treatment outcome in traumatized veterans and police officers

Submitted as:
Jongedijk, R.A., Knipscheer, J.W. [#], van der Aa, N. [#], de Haan, A.M., Kleber, R.J., & Boelen, P.A. Associations between PTSD criteria and treatment outcome in traumatized veterans and police officers.

[#] Both authors contributed equally to this study and manuscript.

6

ABSTRACT

BACKGROUND

A significant proportion of patients with posttraumatic stress disorder (PTSD) do not respond sufficiently to trauma treatment. To date, it has not been clearly demonstrated which patients respond well and which do not.

OBJECTIVE

This study examined whether the four distinct symptom clusters of PTSD as well as two characteristics of the traumatic event criterion were associated with treatment outcome.

METHOD

Participants were 262 veterans and police officers with post-traumatic complaints. Linear Mixed Model Analysis (LMM) was performed to identify whether direct and interpersonal traumatization and the distinct symptom clusters of PTSD according to the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) were associated with baseline scores and pre- to post-treatment changes in PTSD and general psychopathology according to the PTSD Checklist for DSM-5 (PCL-5) and Brief Symptom Inventory (BSI), respectively.

RESULTS

51% Of participants reported clinically significant improvement for PTSD symptoms and 45% for symptoms of general psychopathology. Trauma characteristics and the severity of the four PTSD symptom clusters pre-treatment were not associated with changes in total PTSD scores from pre- to post-treatment. Higher pre-treatment severity of cluster D of PTSD was associated with greater improvement in general psychopathology from pre- to post-treatment. We found some evidence that higher symptom severity of cluster C before treatment was associated with smaller improvement in cluster E, and higher severity on cluster D with greater improvement of the same cluster D.

CONCLUSIONS

Pretreatment PTSD cluster scores do not appear to be related to PTSD treatment outcome. Because a significant proportion of patients did not improve after treatment, we suggest that future studies examine associations of specific symptoms within the PTSD symptom clusters and psychosocial and personal factors with treatment outcome.

KEYWORDS

PTSD, trauma, symptoms, treatment outcome, veterans, police officers, linear mixed models, predictors

6.1 INTRODUCTION

Post-traumatic stress disorder (PTSD) is a common mental disorder that often occurs alongside other mental disorders and tends to have a chronic course (Brady et al., 2000; Spinhoven et al., 2014). A number of psychotherapies have been proven to be effective in reducing PTSD symptoms with large effect sizes (Bisson & Olff, 2021). However, not all patients benefit equally: approximately one-third to one-half of patients still meet criteria for PTSD after treatment (Bradley et al, 2005; Keyan et al., 2024), and up to 75% of patients report residual symptoms after treatment (Bisson et al., 2013; Larsen et al., 2019).

To date, it is not yet fully understood which patients with PTSD will benefit from trauma-focused treatments and which may benefit less or not at all. In their systematic review, Dewar and colleagues (2020) identified several predictors of poor treatment outcome, including comorbid depression, anxiety, hyperarousal, alcohol abuse, older age, low social support, and combat experiences. Particularly veterans with PTSD often experience poor treatment outcome (Jacoby et al., 2022; Steenkamp et al., 2015). Another uniformed group with a high conditional risk of developing work-related PTSD are police officers (Maguen et al., 2009). Police officers are similar to veterans in that they experience multiple serious potentially traumatic events (PTEs) in their work and high levels of work-related stress (Blumberg & Papazoglou, 2019; Queirós et al., 2020; Rentmeesters & Hermans, 2023). To date, little research has been conducted on the treatment outcomes of traumatized police officers compared to veterans. The current study aimed to determine whether specific pre-treatment components of PTSD are associated with different treatment outcomes in a sample including veterans and police officers.

6.1.1. ASSOCIATION OF PRE-TREATMENT PTSD SEVERITY AND TREATMENT OUTCOME

Research on the relationship between pre-treatment PTSD severity and treatment outcomes in veterans has produced mixed results. Several studies reported that higher pre-treatment PTSD severity was associated with poorer treatment outcomes (Allan et al., 2017; Murphy & Smith, 2018; Phelps et al., 2018), while other studies found no such association (Clapp et al., 2016) or even a positive association (Elliott et al., 2005; Forbes et al., 2003). Still other studies found that treatment was less effective for both low and high pre-treatment PTSD severity levels compared to moderate levels (Haagen et al., 2015; Walter et al., 2022). For police officers, one study reported that PTSD severity was unrelated to treatment outcome (Martinmäki et al., 2021). These varying findings may be due to methodological differences between studies, including differences in instruments used to assess outcomes, patient characteristics, research design, and treatment interventions (Elliot et al., 2005).

6.1.2. ASSOCIATION OF THE SPECIFIC PTSD CRITERIA AND TREATMENT OUTCOME

PTSD is defined very heterogeneously in the DSM-5 (Brady et al., 2000; Galatzer-Levy & Bryant, 2013); in addition to the definition of the traumatic stressor (Criterion A), many symptoms are grouped around four comprehensive symptom clusters (Criteria B-E), all associated with the

traumatic event(s). Currently, treatments mostly focus on the disorder as a whole. However, if distinct PTSD symptom clusters can be identified that are associated with poor treatment outcome (so if it can be determined which symptom clusters predict improvement and which do not), it could lead to the development of interventions specifically targeting these clusters. This could potentially make treatments significantly more effective.

To our knowledge, no research has yet investigated associations of the four distinct PTSD clusters with treatment outcome in veterans or police officers. Nevertheless, several studies have shown that certain symptom profiles similar to the PTSD symptom clusters appeared to be predictors of poor response to trauma treatment (Dewar et al., 2020). Examples include severity of pre-treatment depressive and hyperarousal symptoms, which are associated with Clusters D and E, respectively. However, several studies among veterans have not yielded clear results regarding these predictors (Murphy & Smith, 2018; Phelps et al., 2018).

In addition to the symptom clusters, the DSM-5 definition of PTSD includes Criterion A, or the PTE (APA, 2013). There are strong indications that the number of PTEs experienced does not influence treatment outcome (Schneider et al., 2020). However, specific aspects of the nature of these events may impact treatment outcome. For example, *interpersonal* PTEs, such as physical and sexual violence, have been found to be associated with poorer response to PTSD treatment compared to other types of PTEs (Fonzo et al., 2020; Rosenkranz & Muller, 2011). Furthermore, the proximity of experiencing a PTE may be an important determinant of treatment outcome (Jongedijk et al., 2022; Marx et al., 2023). In particular, it has been suggested that *direct* exposure to PTEs (i.e., directly experiencing a PTE yourself) will lead to a worse response to treatment than *indirect* exposure to PTEs, such as witnessing PTEs or learning that PTEs occurred in others.

6.1.3. AIMS OF THE STUDY

Our first aim was to investigate whether interpersonal PTEs, direct exposure to PTEs, and pre-treatment symptom severity of the four distinct PTSD symptom clusters were associated with *total* overall pre-treatment symptom severity. We also measured 'general psychopathology' to examine if these variables were specifically related to PTSD. We hypothesized that more direct and interpersonal exposure to traumatic events would be associated with higher pre-treatment severity of both PTSD and general psychopathology symptoms. Furthermore, we hypothesized that all pretreatment PTSD symptom clusters, as measured by the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5), were associated with the total severity of both pretreatment PTSD, as measured by the PTSD checklist for DSM-5 (PCL-5) and general psychopathology, as measured by the Brief Symptom Inventory (BSI).

Second, we investigated whether the number of interpersonal and direct exposure to trauma, as well as pre-treatment severity scores of the distinct PTSD symptom clusters were associated with changes in overall symptom severity from pre-treatment to post-treatment. Based on the limited literature (e.g., Dewar et al., 2020), we expected that more direct trauma exposure, more interpersonal trauma exposure, and higher pre-treatment levels of symptom

cluster D and cluster E, in particular, would be associated with smaller reductions in symptom severity scores between pre- and post-treatment.

Our third aim was to provide insight into which symptom clusters would specifically improve, allowing for more targeted treatment. We therefore exploratively analyzed the associations between distinct pre-treatment PTSD cluster severity scores and changes in these distinct PTSD cluster scores from pre-treatment to post-treatment.

6.2 METHOD

6.2.1. PARTICIPANTS AND PROCEDURE

In this study secondary analyses of data from routine clinical assessments were performed. Participants were referred for outpatient treatment at ARQ Centrum'45, a Dutch national institute for diagnostics and treatment of long-lasting trauma-related disorders. The sample consisted of veterans and police officers who had been traumatized during their work. In general, all patients reported enduring posttraumatic complaints and many comorbidities, consistent with similar study samples (Jongedijk et al., 2019; Martinmäki et al., 2021). All veterans and police officers who enrolled the outpatient treatment program between 2014 and 2022 were included in this study.

Data were primarily collected for diagnostic and treatment purposes and secondarily used for research purposes. The CAPS-5, Life Event Check List for DSM-5 (LEC-5), PCL-5, and BSI were administered at the initial routine diagnostic assessment before the start of treatment. At the end of treatment, the PCL-5 and BSI were administered again. The CAPS-5 was administered by trained clinical staff members. All data were pseudonymized and stored in a research database.

6.2.2. TREATMENT PROGRAM

The treatment consisted of two specialized treatment programs (one for veterans and one for police officers) for one day per week with an average duration of 19.37 months (SD=12.01). Some patients received individual outpatient follow-up care for their residual complaints. The treatment program always included at least one form of evidence-based trauma-focused treatment (TFT), such as Eye Movement Desensitization and Reprocessing (EMDR), Prolonged Exposure (PE), Narrative Exposure Therapy (NET), and/or Brief Eclectic Psychotherapy for PTSD (BEPP). Because of the chronic, severe and often disrupting psychopathology, these TFTs were combined with additional therapy components, such as supportive group therapy, art therapy, psychomotor therapy, and supportive counseling.

6.2.3. MEASURES

The Dutch version of the CAPS-5 was used to assess pre-treatment PTSD symptoms (Boeschoten et al., 2014a). The CAPS-5 is a 30-item structured clinical interview matching the DSM-5 classification for PTSD. Items with regard to symptom severity over the past month are

rated on a 5-point scale ranging from 0 (absent) to 4 (extreme/incapacitating). Total severity scores were calculated by summing the 5 items of cluster B (re-experiencing), 2 items of cluster C (avoidance), 7 items of cluster D (negative alterations in cognition and mood), and 6 items of cluster E (hyper-arousal). The Dutch CAPS-5 has shown good psychometric properties in a sample of patients with different trauma backgrounds (Boeschoten et al., 2018).

The Dutch version of the LEC-5 was used to assess exposure to PTEs (Boeschoten et al., 2014b). The LEC-5 comprises 17 PTE *types* for which participants need to indicate whether it: (a) happened to you personally, (b) you witnessed it happen to someone else, (c) you learned about it happening to a close family member or friend, (d) you were exposed to it as part of your job, (e) you're not sure if it fits, and/or (f) it doesn't apply to you. Exposure to a PTE was present if respondents responded with option a, b, c, or d. The total number of PTE types was computed by counting the number of PTE types to which a respondent was exposed. The total number of PTEs a respondent was directly exposed to, was computed by counting the number of PTE types to which a participant responded with option a (direct exposure). To distinguish between interpersonal and non-interpersonal PTEs, the LEC-5 items were independently reviewed and categorized into interpersonal and non-interpersonal PTE types by two of the authors (RJ and JK) with initial full agreement. According to this procedure, the following PTE types were identified as interpersonal PTEs: Physical assault (item 6), Assault with a weapon (7), Sexual assault (8), Other unwanted or uncomfortable sexual experience (9), Combat or exposure to a war-zone (10), and Captivity (11). The total number of interpersonal PTEs was computed by summing the overall number of interpersonal PTE types (i.e., option a, b, c, and d).

The Dutch version of the PCL-5 was used to measure pre- and post-treatment PTSD symptom severity (Boeschoten et al., 2014c). The PCL-5 is a self-report questionnaire, consisting of 20 items assessing how much a participant has been bothered by DSM-5 symptoms of PTSD over the past month. Items need to be rated on a 5-point scale ranging from 0 (not at all) to 4 (extremely). PTSD symptom severity was calculated by summing the 5 items of cluster B, 2 items of cluster C, 7 items of cluster D, and 6 items of cluster E. Good psychometric properties have been reported for the Dutch version of the PCL-5 (Van der Meer et al., 2017; Van Praag et al., 2020).

The Dutch version of the BSI was used to measure general psychopathology (De Beurs, 2011). The BSI is a self-report questionnaire assessing how much a participant has been bothered by 53 symptoms of psychopathology during the past week. Items need to be rated on a 5-point scale ranging from 0 (not at all) to 4 (extremely). Severity of general psychopathology was computed by averaging all 53 item scores. The BSI is an international well validated instrument and good psychometric properties have been reported for the Dutch version (De Beurs, 2011).

6.2.4. STATISTICAL ANALYSIS

Data processing and statistical analyses were performed in IBM SPSS Statistics version 27. Linear Mixed Model analysis (LMM) was used because LMM can handle missing data better

by utilizing all available data instead of listwise deletion which is applied in other statistical techniques. To reduce the risk of overfitting the models (due to the moderate sample size in combination with many independent variables) the hypothesized associations were tested in separate models.

To address the first aim of the current study, it was tested whether the severity of each of the four PTSD symptom clusters (according to the CAPS-5), as well as the amount of interpersonal and direct trauma exposure (LEC-5), were associated with total pre-treatment symptom severity of PTSD (PCL-5) and general psychopathology (BSI). To accomplish this, three separate models per outcome variable were used. Model 1 included fixed effects of the number of direct PTE types participants were exposed to and the total number of PTE types (i.e., the categories according to the LEC-5), as well as the interaction between the total numbers of PTEs and PTEs with direct trauma exposure. Model 2 included fixed effects of the number of interpersonal PTE types participants were exposed to and the total number of PTE types, as well as the interaction between these variables. Because participants were exposed to many different PTE types, it is likely that they scored frequently on both categories of PTEs. In order to better highlight the relative share of the two PTE characteristics on the total of PTEs, the hypothesized effects of the amount of direct and interpersonal exposure to trauma were included in the model as interactions with respect to the total number of PTEs. Finally, Model 3 included the four PTSD symptom clusters.

To address the second aim of this study, two separate models including a fixed effect of time (pre- and post-treatment measurements) and a random intercept were used to test whether severity of PTSD symptoms and general psychopathology decreased between pre- and post-treatment. A first-order autoregressive (AR1) covariance structure was assumed for all models regarding change in outcome measures between pre- and post-treatment.

Subsequently, it was tested whether change in the severity of PTSD symptoms and overall general psychopathology between pre- and post-treatment were associated with the number of interpersonal PTEs and the number of PTEs one was directly exposed to, as well as with the pre-treatment severity of the four PTSD symptom clusters. To accomplish this, three separate models per outcome variable were used. Model 1 included two two-way interactions: fixed effects of time and total number of direct PTE types participants were exposed to and the total number of PTE types, as well as the interaction between time, total number of PTE types, and number of direct PTE types. Model 2 included the same variables, but regarding interpersonal PTE types. Model 3 included four two-way interactions: fixed effects of time and the severity of the four PTSD symptom clusters, as well as the interaction between time and these symptom clusters. The hypothesized effects of the amount of direct and interpersonal trauma exposure were included in the model as interactions because of the reason mentioned above.

Last, to address the third aim, we chose to repeat the analysis for exploratory purposes. We examined not only the influence of the severity scores of the four PTSD symptom clusters before treatment (CAPS-5) on the change in total PTSD severity scores from pre- to posttreatment (PCL-5) (aim two), but also on the changes in scores on the distinct PTSD symptoms clusters (PCL-5).

Intra-individual changes between pre- and post-treatment in severity of PTSD symptoms and general psychopathology were examined using cut-off values for reliable change. A difference of 10 points between 2 measurements on the PCL-5 can be used as a minimum threshold for clinically meaningful change (Weathers et al., 2013). Likewise, a difference of 0.35 points between 2 measurements on the Dutch version of the BSI can be used as a threshold for statistically reliable change (De Beurs, 2011).

6.3 RESULTS

6.3.1. DESCRIPTIVE AND PRE-TREATMENT RESULTS

Between 2014 and 2022, 487 veterans and police officers were enrolled in an outpatient treatment program at ARQ Centrum'45. Data from a subsample of 262 patients for whom pre- and/or post-treatment data on at least one of the two outcome measures were available were included in the statistical analyses. In Table 6.1 sociodemographic and clinical characteristics of the study sample (N=262) are presented and compared with the total patient group (N=487). As can be seen from the table, the two groups are very similar in the characteristics described.

The mean total number of PTE types per participant was 9.56, with the mean number of PTE types related to direct exposure being 4.91 and interpersonal exposure being 3.62, respectively. Almost all patients reported PTEs categorized as 'direct exposure' (96.7%) as well as 'interpersonal' (99.2%). Symptom severity on the CAPS-5, PCL-5, and BSI was clearly within a clinical range.

Table 6.1. Demographic, clinical, and trauma characteristics for total sample and study sample.

	Total sample (n = 487)			Study sample (n = 262)		
	n	%	M (SD)	n	%	M (SD)
Demographic characteristics						
Gender						
Male	420	86.2%		223	85.1%	
Female	67	13.8%		39	14.9%	
Age	487		45.62 (10.00)	262		46.36 (9.96)
Profession						
Veterans	246	50.5%		117	44.7%	
Police officers	241	49.5%		145	55.3%	
Education	352			242		
Lower	97	27.6%		61	25.2%	
Middle	181	51.4%		126	52.1%	
Higher	74	15.2%		55	22.7%	
Clinical characteristics						
PTSD diagnosis	249			153		
Yes	220	88.4%		136	88.9%	
No	29	11.6%		17	11.1%	

Table 6.1. Continued.

	Total sample (n = 487)			Study sample (n = 262)		
	n	%	M (SD)	n	%	M (SD)
PTSD symptom severity (CAPS-5)	251		39.73 (11.68)	154		39.66 (10.84)
Crit. B – Intrusion			9.89 (3.84)			9.72 (3.72)
Crit. C – Avoidance			4.86 (1.89)			4.95 (1.89)
Crit. D – Negative cognitions/mood			13.31 (4.98)			13.29 (4.73)
Crit.–E - Arousal			11.67 (3.88)			11.70 (3.61)
PTSD symptom severity (PCL-5)	380		50.72 (12.84)	253		50.36 (12.74)
Severity general psychopathology (BSI)	384		1.81 (0.69)	259		1.79 (0.70)
Trauma characteristics						
Total number	245		9.58 (2.62)	145		9.56 (2.54)
Direct exposure			4.91 (2.68)			4.67 (2.51)
Interpersonal			3.62 (1.37)			3.60 (1.27)

Note. CAPS-5 = Clinician-Administered PTSD Scale for DSM-5; PCL-5 = PTSD Checklist for DSM-5; BSI = Brief Symptom Inventory.

6.3.2. PRE-TREATMENT SEVERITY OF PTSD AND GENERAL PSYCHOPATHOLOGY

The first aim of the study was to investigate whether pre-treatment severity of the total PTSD score and general psychopathology score were associated to direct trauma exposure, interpersonal trauma exposure, and the pre-treatment severity of the *distinct* PTSD symptom clusters. Results of the analyses are presented in Table 6.2 and 6.3.

For both pre-treatment PTSD (Table 6.2) and general psychopathology (Table 6.3), the first and second LMM models showed that there were no significant interactions between the total number of PTEs participants had been exposed to and the number of direct trauma exposure and between the total number of PTEs participants had been exposed to and the amount of interpersonal trauma exposure. Results of the third model in Table 6.2 showed that pre-treatment Criterion D (negative alterations in cognitions and mood) and Criterion E (arousal) scores were significantly associated with pre-treatment *total* PTSD severity ($p < .05$). Otherwise, the pre-treatment severity scores of the distinct CAPS-5 symptom clusters were only significantly associated with the corresponding pre-treatment subscales of the PCL-5 clusters ($p < .001$ for all clusters), and not with the other subscales. The third model in Table 6.3 (pre-treatment general psychopathology) showed that only pre-treatment PTSD Criterion D scores were significantly associated with pre-treatment severity of general psychopathology ($p < .001$). The other PTSD symptom clusters were not significantly associated with pre-treatment severity regarding PTSD symptoms and symptoms of general psychopathology.

Table 6.2. Linear mixed models analysis of direct trauma exposure, interpersonal trauma exposure, and pretreatment severity of distinct PTSD symptom clusters predicting pretreatment severity of total PTSD.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model 1 (n=210)						
Intercept	50.38	0.992			48.427	52.339
Direct trauma exposure	-0.153	1.098	-0.139	.889	-2.318	2.012
Total trauma exposure	1.348	1.055	1.278	.203	-0.732	3.429
Direct trauma x total exposure	-0.128	0.915	-0.140	.889	-1.932	1.677
Model 2 (n=210)						
Intercept	49.433	1.042			47.379	51.487
Interpersonal trauma exposure	1.348	1.408	0.957	.340	-1.428	4.123
Total trauma exposure	0.394	1.408	0.280	.780	-2.381	3.169
Interpersonal trauma x total exposure	1.158	0.703	1.647	.101	-0.228	2.544
Model 3 (n=225)						
Intercept	32.987	2.667			27.731	38.242
Intrusion	0.349	0.253	1.380	.169	-0.150	0.848
Avoidance	0.108	0.498	0.217	.828	-0.872	1.089
Negative alterations in cognitions and mood	0.462	0.195	2.364	.019*	0.077	0.847
Arousal	0.756	0.250	3.026	.003**	0.264	1.248

Note. Model 1: direct versus total trauma exposure; Model 2: interpersonal versus total trauma exposure; Model 3: PTSD symptom clusters. * = p < .05; ** = p < .010

Table 6.3. Linear mixed models analysis of direct trauma exposure, interpersonal trauma exposure, and pretreatment severity of individual PTSD symptom clusters predicting pretreatment severity of general psychopathology.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model 1 (n=213)						
Intercept	1.820	0.053			1.715	1.925
Direct trauma exposure	-0.018	0.059	-0.303	.763	-0.133	0.098
Total trauma exposure	0.090	0.056	1.592	.113	-0.021	0.201
Direct trauma x total exposure	-0.039	0.050	-0.790	.430	-0.137	0.059
Model 2 (n=213)						
Intercept	1.783	0.056			1.672	1.894
Interpersonal trauma exposure	0.088	0.076	1.148	.252	-0.063	0.238
Total trauma exposure	0.021	0.076	0.275	.784	-0.130	0.172
Interpersonal trauma x total exposure	0.024	0.038	0.644	.520	-0.050	0.099
Model 3 (n=228)						
Intercept	0.710	0.136			0.441	0.979
Intrusion	0.022	0.013	1.728	.085	-0.003	0.048
Avoidance	0.009	0.025	0.351	.726	-0.041	0.059
Negative alterations in cognitions and mood	0.049	0.010	4.922	< .001*	0.029	0.068
Arousal	0.019	0.013	1.470	.143	-0.063	0.044

Note: Model 1: direct versus total trauma exposure; Model 2: interpersonal versus total trauma exposure; Model 3: PTSD symptom clusters. * = p < .001

6.3.3. CHANGES IN PTSD AND GENERAL PSYCHOPATHOLOGY FROM PRE- TO POST-TREATMENT

The second objective of the study was to investigate whether changes in overall PTSD symptom severity and general psychopathology from pre-treatment to post-treatment were associated with direct exposure to trauma, interpersonal exposure to trauma, as well as pre-treatment symptom severity regarding the distinct PTSD symptom cluster severity (Criteria B-E). Results of the analyses are presented in Table 6.4 and 6.5.

Results of the first model showed that there was a significant decrease in the severity of PTSD symptoms (Table 6.4) and general psychopathology (Table 6.5) from pre- to post-treatment. Mean levels of pre- and post-treatment severity of PTSD symptoms and general psychopathology are presented in Figure 6.1 and 6.2. Analysis of intra-individual change indicated that 51% of patients reported clinically meaningful improvement with regard to PTSD symptom severity, 39% remained unchanged and 11% deteriorated. With regard to general psychopathology 45% of the patients reported statistically reliable change, 39% remained unchanged, and 16% deteriorated.

No significant interactions between the total number of PTEs and the number of direct trauma exposures and between the total number of PTEs and number of interpersonal trauma exposures were found, neither for changes in PTSD (Table 6.4) nor for changes in general psychopathology (Table 6.5). This indicated that the amount of exposure to direct trauma types and the amount of exposure to interpersonal trauma types are not significantly related to change in the severity of PTSD symptoms and general psychopathology during trauma treatment.

Results of the fourth model in Table 6.4 showed that none of the pre-treatment PTSD symptom clusters were significantly associated with change in overall PTSD symptom severity. Results of the fourth model in Table 6.5 showed that more severe pre-treatment Criterion D symptoms were significantly associated with a larger decrease in severity of general psychopathology ($p < .05$). The other PTSD symptom clusters were not significantly associated with changes in general psychopathology.

Figure 6.1. Mean levels of pre-treatment and post-treatment PTSD symptom severity and 95% confidence intervals according to the PCL-5 (PTSD Checklist for DSM-5).

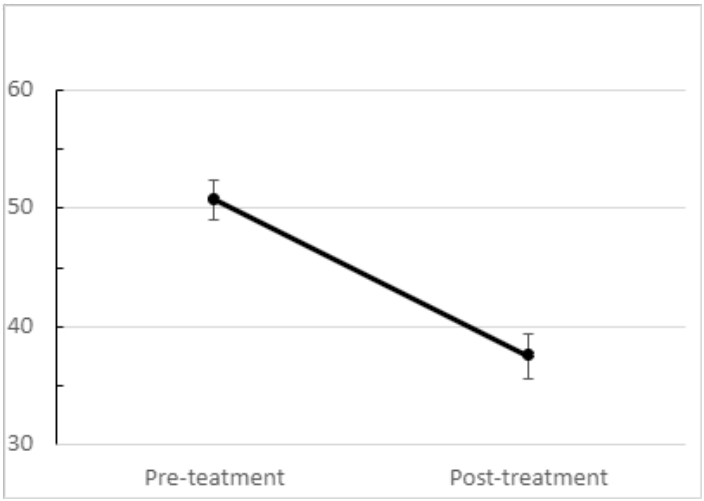


Figure 6.2. Mean levels of pre-treatment and post-treatment general psychopathology symptom severity and 95% confidence intervals according to the BSI (Brief Symptom Inventory).

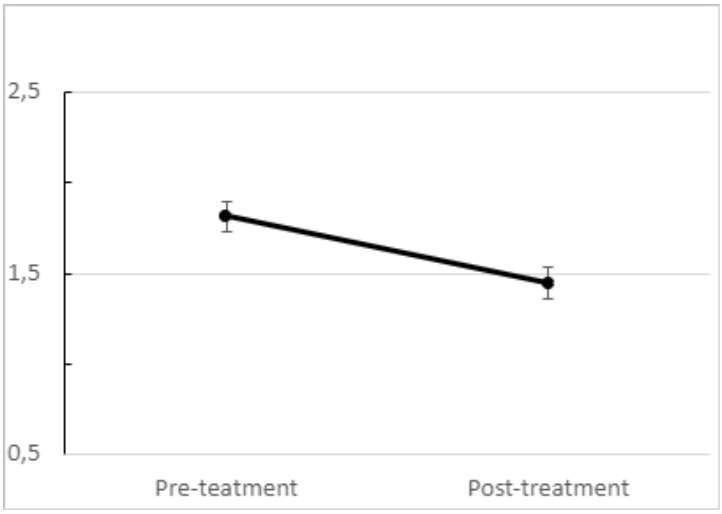


Table 6.4. Linear mixed models analysis of direct trauma exposure, interpersonal trauma exposure, and pretreatment severity of individual PTSD symptom clusters predicting change in PTSD symptoms during trauma-focused treatment.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model 1 (n=418)						
Intercept	37.533	0.987			35.595	39.471
Time	13.201	1.097	12.30	< .001	11.042	15.359
Model 2 (n=225)						
Intercept	22.049	10.179			2.029	42.069
Time	24.155	11.279	2.142	.033	1.910	46.400
Direct trauma exposure	-1.319	2.529	-0.522	.603	-6.307	3.670
Total trauma exposure	-1.548	1.155	-1.340	.182	-0.382	0.730
Direct trauma x total exposure	0.189	0.233	0.814	.417	-0.270	0.649
Model 3 (n=225)						
Intercept	40.527	14.151			12.691	68.363
Time	16.470	14.976	1.100	.273	13.048	45.988
Interpersonal trauma exposure	1.889	4.341	0.435	.664	-6.669	10.447
Total trauma exposure	-1.211	1.787	-0.678	.499	-4.733	2.312
Interpersonal trauma x total exposure	0.008	0.410	0.018	.985	-0.801	0.816
Model 4 (n=236)						
Intercept	20.245	4.678			11.045	29.445
Time	12.553	5.253	2.390	.018	2.197	22.909
Intrusion	-0.284	0.456	-0.622	.534	-1.182	0.615
Avoidance	-1.681	0.888	-1.893	.060	-3.431	0.070
Negative alterations in cognitions and mood	0.433	0.355	1.218	.225	-0.268	1.133
Arousal	0.489	0.465	1.051	.294	-0.429	1.408

Note: Model 1: change in total PTSD symptoms; Model 2: direct versus total trauma exposure; Model 3: interpersonal versus total trauma exposure; Model 4: PTSD symptom clusters.

Table 6.5. Linear mixed models analysis of direct trauma exposure, interpersonal trauma exposure, and pretreatment severity of individual PTSD symptom clusters predicting change in general psychopathology during trauma-focused treatment.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model 1 (n=422)						
Intercept	1.446	0.046			1.357	1.536
Time	0.368	0.049	7.576	< .001	0.273	0.464
Model 2 (n=230)						
Intercept	0.893	0.462			-0.016	1.801
Time	0.436	0.509	0.856	.393	-0.569	1.441
Direct trauma exposure	0.014	0.114	0.118	.906	-0.212	0.239
Total trauma exposure	-0.014	0.052	-0.262	.794	-0.117	0.090
Direct trauma x total exposure	0.000	0.011	0.015	.988	-0.021	0.021

Table 6.5. Continued.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model 3 (n=230)						
Intercept	1.910	0.574			0.781	3.038
Time	-0.152	0.612	-0.248	.804	-1.358	1.055
Interpersonal trauma exposure	0.217	0.185	1.176	.241	-0.147	0.581
Total trauma exposure	0.041	0.074	0.554	.581	-0.106	0.188
Interpersonal trauma x total exposure	-0.018	0.017	-1.048	.296	-0.051	0.016
Model 4 (n=239)						
Intercept	0.679	0.218			0.249	1.108
Time	-0.072	0.243	-0.295	.768	-0.408	0.551
Intrusion	-0.022	0.021	-1.027	.306	-0.063	0.020
Avoidance	-0.021	0.041	-0.501	.617	-0.102	0.061
Negative alterations in cognitions and mood	0.047	0.016	2.938	.004*	0.015	0.079
Arousal	0.005	0.022	0.025	.980	-0.042	0.043

Note: Model 1: change in total PTSD symptoms; Model 2: direct versus total trauma exposure; Model 3: interpersonal versus total trauma exposure; Model 4: PTSD symptom clusters. * = p < .05

6.3.4. CHANGES IN PTSD SYMPTOM CLUSTERS DURING TREATMENT

With regard to the third aim of the study, we looked exploratively at the associations of scores on the four pre-treatment PTSD symptom clusters according to the CAPS-5 with changes in the same symptom clusters from pre- to post-treatment, at both moments assessed with the PCL-5 (See Supplementary Tables 1-4).

The time-only models showed that patients reported a significant decrease of symptoms on all PTSD clusters from pre- to post-treatment ($p < .001$ for all clusters). However, once we accounted for the number of analyses we have performed (by Bonferroni-correction) there appeared to be no significant influence of any pre-treatment CAPS-5 PTSD symptom cluster on the improvement of PCL-5's PTSD clusters from pre- to post-treatment. Therefore, we will only report certain observed trends in the data. None of the pre-treatment PTSD symptom clusters as assessed with the CAPS-5 were significantly associated with changes in the severity of symptom cluster B and cluster C (both assessed with the PCL-5) (see Supplementary Tables 1 and 2, respectively). However, pre-treatment severity of symptom cluster D (CAPS-5) might be associated with improvement on that same cluster from pre- to post-treatment of cluster D (PCL-5, $p = .012$) (Supplementary Table 3). As the slope of this observed trend is positive, higher severity scores pre-treatment appear to predict better improvement after treatment. Finally, it can be cautiously assumed that more severe pre-treatment levels of avoidance (cluster C, CAPS-5) might be associated with smaller reductions in arousal from pre- to post-treatment (cluster E, PCL-5) ($p = .030$) (Supplementary Table 4).

6.4 DISCUSSION

Most treatment outcome studies take PTSD as a full diagnosis. Because PTSD, especially in the DSM-5, has a great diversity of symptoms, it is very relevant to focus on the distinct components of PTSD. To investigate which components of PTSD are specifically associated with treatment outcome, the current study examined whether two aspects of Criterion A (i.e., direct trauma exposure and interpersonal trauma exposure; assessed by a standardized self-report questionnaire) and the pre-treatment severity of distinct PTSD symptom clusters (Criteria B to E, assessed via clinical interview) were associated with (a) pre-treatment symptom severity of PTSD and general psychopathology, (b) changes in the total severity of PTSD and general psychopathology from pre-treatment to post-treatment, and (c) changes in the distinct PTSD cluster scores from pre-treatment to post-treatment (all assessed by standardized self-report questionnaires).

6.4.1. PRE-TREATMENT SEVERITY OF PTSD AND GENERAL PSYCHOPATHOLOGY

Our first aim was to investigate if direct and interpersonal trauma exposure (according to Criterion A) and pre-treatment severity scores on the distinct CAPS-5 symptom clusters Criteria B-E) were associated with pre-treatment total severity scores on the PCL-5 and BSI.

Contrary to our hypothesis, neither the amount of 'direct' PTEs, nor the amount of 'interpersonal' PTEs was significantly associated with the severity of pre-treatment PCL-5 and BSI scores. Several factors may explain this. Participants reported a wide range of PTE types (mean 9.58), making it difficult to distinguish between types of trauma and likely blurring the boundaries between 'direct versus indirect' and 'interpersonal versus non-interpersonal' trauma. Additionally, the impact of PTEs in these patients with long-standing complaints could be overshadowed by long-term stressors such as ongoing psychological problems, relationship issues, work and adjustment difficulties, and health problems (Armour et al., 2015; Jongedijk et al., 2019). Furthermore, early childhood trauma, an important form of interpersonal trauma, was not explicitly measured, though it significantly influences severity of mental health symptomatology (Maercker et al., 2022; Teicher et al., 2022).

The symptom scores of the CAPS-5 and PCL-5 have been shown to be highly correlated when administered in cross-sectional designs (e.g., Geier et al., 2019; Weathers et al., 2018) and in a longitudinal design (Lee et al., 2022). But these studies looked at the total PTSD score of both measures, and not at the scores on the distinct PTSD symptom clusters. We found that pre-treatment severity scores of the distinct CAPS-5 symptom clusters were significantly associated with the corresponding pre-treatment subscales of the PCL-5, and not with the other subscales. Furthermore, we found that the pre-treatment severity of symptom clusters D and E of the CAPS-5 was associated with the total PTSD symptom severity of the PCL-5 before treatment. The severity of (only) symptom cluster D was also related to the severity of general psychopathology. This indicates that symptom cluster D is particularly relevant for clinical practice due to its association with a broad range of psychological complaints in patients.

6.4.2. CHANGES IN PTSD AND GENERAL PSYCHOPATHOLOGY

Our second goal focused on changes during treatment. About half of the participants reported improvement in total PTSD symptoms (51%) and general psychopathology (45%) after treatment. Alongside improvement on total symptom severity, the distinct PTSD symptom clusters also improved during treatment. However, a significant proportion of participants reported unchanged or worsened symptoms, highlighting the importance of identifying which PTE types and PTSD symptom clusters influence treatment outcome.

Contrary to our hypothesis, PTEs defined as 'direct exposure' and with an 'interpersonal nature' were not associated with less reduction of PTSD and general psychopathology symptoms over the course of treatment. As we argued in the previous paragraph, the large number of PTE types in total and the likely accumulation of psychosocial and health-related functioning in patient groups with long-term psychological complaints, has probably blurred the strict boundaries of the different PTE types and therefore their distinct influence.

We hypothesized that the severity of pre-treatment symptom clusters D and E would be associated with less changes on both the PCL-5 and BSI between pre- and post-treatment. However none of the distinct pre-treatment PTSD symptom clusters were associated with changes between pre- and post-treatment total PTSD scores. Only (higher) severity of PTSD symptom cluster D was associated with better improvement of symptoms associated with general psychopathology (BSI).

Based on these findings, it can be argued that the symptom clusters of PTSD are not distinctive and predictive of changes in overall PTSD symptom severity during treatment. This would mean that the heterogeneity of the current PTSD concept according to DSM-5 does not have significance for predicting treatment outcomes. It seems that this heterogeneity is mainly intended to encompass the multitude of psychological complaints that patients exhibit (e.g., Jongedijk et al., 2023) and that there are likely other predictors than the PTSD symptom clusters that are associated with treatment outcome.

First, it might be insufficient to look at the symptom clusters as a whole, as they might still be too heterogeneous. Specific symptoms within the PTSD clusters might be a better predictor of treatment result. The findings about this in the literature are not always clear: in some studies symptoms such as anger, guilt, or sleep problems were shown to be predictors of worse treatment outcome, while in others no difference was found (Dewar et al., 2020). However, symptoms may need to be looked at even more specifically. A recent review showed that, for example, within the sleep disorder symptoms, specifically 'sleep disordered breathing' influenced the outcome of PTSD treatment (Bottari et al., 2023).

A symptom-oriented approach fits in with the so-called Network Approach for diagnosing mental problems (Fried, 2022). In this Network Approach, mental disorders are seen as complex systems in which symptoms are related to each other, influence and cause each other, and give rise to mental health problems. However, as Fried (2022, p. 505) states: 'symptoms are not inherently superior features compared with etiology, personality, and other features.' This would mean that other factors (also) influence treatment outcome. Several personal and social

characteristics have been described that are associated with predicting a negative treatment outcome, such as persistent psychosocial stress, maladaptive coping and attachment styles, lack of social support, poor quality of life (Dewar et al, 2020; Fletcher et al., 2017; Keyan et al., 2024), financial compensation procedures (Martinmäki et al., 2021), or consistent childhood emotional neglect (Maercker et al, 2022; Teicher et al., 2022).

6.4.3. CHANGES OF DISTINCT PTSD SYMPTOM CLUSTERS

One of our findings was that higher severity scores on Criterion D of PTSD (negative alterations in cognition and mood) were associated with better treatment outcome for general psychopathology. Moreover, in our explorative analyses we found that higher severity scores of symptom cluster D (CAPS-5) were associated with a greater reduction in specifically symptom cluster D and not in the other symptom clusters (PCL-5). One hypothesis could be that our specialist treatment program, which included both evidence-based trauma-oriented therapy and additional treatment modules, provided extra attention to general psychopathology for patients with high cluster D scores. These patients probably received additional, more targeted interventions for, for example, depression-related symptoms, leading to better outcomes for this specific aspect of psychopathology. Furthermore, trauma-focused treatment itself is effective for general and depression-related psychopathology in addition to PTSD symptomatology (Dominguez et al., 2021).

Another, explorative, finding was that the more severe the pre-treatment avoidance symptoms were (symptom cluster C on the CAPS-5), the less change in arousal symptoms (changes in symptom cluster E on PCL-5 from pre- to post-treatment) was observed. This finding may be significant, because Smid and colleagues (2018) found that symptoms of cluster E, in particular concentration problems, persisted in a significant proportion of police officers after trauma treatment. Perhaps in patients with high scores on the PTSD avoidance cluster, extra attention should be paid to these symptoms in treatment in order to achieve a greater reduction in the arousal related Cluster E symptoms.

6.4.4. STRENGTHS AND LIMITATIONS

To our knowledge, this is the first study examining the association between the different PTSD components according to DSM-5 in conjunction with each other and treatment outcome in such a specific patient sample. The sample was quite large in size and was a naturalistic, clinical sample of patients with severe and long-lasting psychotrauma complaints. Moreover, pre-treatment PTSD diagnosis was carried out with the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5), which is seen as the golden standard in diagnosing PTSD.

The study had several limitations. First, there was a fairly large number of missing data. By carrying out the statistical processing with Linear Mixed Models we were able to partly solve this: individuals from the sample with one or more missing data could still be included in the analyses. Second, the study was a naturalistic study based on archival data. There was therefore no standardized treatment procedure and no comparison group and therefore no

causal conclusions about the intervention can be drawn. Third, data on change between pre- and post-treatment came from self-report questionnaires, which may introduce response bias compared to clinician-based clinical interviews. And finally, the nature of the sample (uniformed patients who had previously had one or more trauma-oriented treatments and showed long-term psychotrauma complaints) implies that extrapolation of the current findings to other traumatized patient groups should be done cautiously.

6.4.5. IMPLICATIONS

Although we found a significant reduction in PTSD severity and general psychopathology symptoms in a sample of severely traumatized patients, several patients did not benefit from treatment, prompting further investigation into the associations between the different components of PTSD and outcome of the treatment.

No association was found between the amount of direct and interpersonal traumatization and treatment outcome. We also found no influence of the distinct pre-treatment PTSD symptom clusters on treatment outcome. However, it turned out that a higher severity of cognition and mood related symptoms in cluster D (according to the CAPS) was associated with a greater improvement in general psychopathology (according to the BSI).

As we were unable to identify PTSD symptom clusters associated with PTSD treatment outcome, it could be argued that these clusters are too heterogeneous. After all, they contain from two to even seven symptom items. It is possible that the distinct symptoms within the clusters have more influence on treatment outcome than the overall symptom clusters. This is consistent with the literature that advocates a more symptom-oriented diagnostic approach (Fried, 2022; Schmidt, 2015). It is recommended that future studies look more into the role of specific symptoms and their association with response to PTSD treatment outcome. This could yield patient profiles that provide insight into which patient will respond better or less well to treatment. From here, patients who do not respond well to treatment could be offered an adapted, tailor-made and therefore potentially more effective treatment approach aimed at the specific symptom profile. Furthermore, the findings of specific symptom profiles may have conceptual consequences: they may identify PTSD symptoms that are more relevant than others, potentially reducing the heterogeneity of the current PTSD construct.

Next to these reflections, we argue for a broader view than just psychopathology. Both for diagnostics, treatment and for future research, it is recommended to pay attention to more context-related factors that could be associated with treatment outcome, such as comorbid mental and physical problems, psychosocial dysfunctions, dysfunctional personality variables, and also pre-trauma variables such as a history of emotional neglect in childhood.

AUTHORS CONTRIBUTION

RJ: conceptualization, methodology, formal analysis, writing – original draft
JK: writing – review and editing, supervision
NvdA: methodology, formal analysis, data curation, writing – review and editing

AdH: formal analysis, data curation, writing – review and editing
RK: writing – review and editing, supervision
PB: writing – review and editing, supervision

REFERENCES

Allan, N.P., Gros, D.F., Myers, U.S., Korte, K.J., & Acierno, R. (2017). Predictors and outcomes of growth mixture modeled trajectories across an exposure-based PTSD intervention with veterans. *Journal of Clinical Psychology, 73*(9), 1048-1063

APA (American Psychiatric Association) (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.*).* Arlington, VA: Author.

Armour, C., Contractor, A., Elhai, J. D., Stringer, M., Lyle, G., Forbes, D., & Richardson, J. D. (2015). Identifying latent profiles of posttraumatic stress and major depression symptoms in Canadian veterans: Exploring differences across profiles in health related functioning. *Psychiatry Research*, *228*(1), 1-7. doi:10.1016/j.psychres.2015.03.011

Bisson, J. I., & Olff, M. (2021). Prevention and treatment of PTSD: the current evidence base. *European Journal of Psychotraumatology*, *12*(1), 1824381. doi:10.1080/20008198.2020.1824381

Bisson, J. I., Roberts, N. P., Andrew, M., Cooper, R., & Lewis, C. (2013). Psychological therapies for chronic post-traumatic stress disorder (PTSD) in adults. *Cochrane Database Syst Rev*(12), CD003388. doi:10.1002/14651858.CD003388.pub4

Blumberg, D., & Papazoglou, K. (2019). A brief introduction to multiple psychic wounds in police work. *Crisis, Stress, and Human Resilience: An International Journal, 1*(1), 28-31.

Boeschoten, M. A., Bakker, A., Jongedijk, R. A., Van Minnen, A., Elzinga, B. M., Rademaker, A. R., & Olff, M. (2014a). Clinician-Administered PTSD Scale for DSM-5 (Dutch version). https://www.psychotraumadiagnostics.centrum45.nl/nl/ptss

Boeschoten, M.A., A. Bakker, R.A. Jongedijk, & M. Olff (2014b). Life Events Checklists for DSM-5 (LEC-5) (Dutch version). https://www.psychotraumadiagnostics.centrum45.nl/nl/ptss

Boeschoten, M. A., A. Bakker, R. A. Jongedijk, & M. Olff (2014c). PTSD Check List for DSM-5 (PCL-5) (Dutch version). https://www.psychotraumadiagnostics.centrum45.nl/nl/ptss

Boeschoten, M. A., Van der Aa, N., Bakker, A., Ter Heide, F. J. J., Hoofwijk, M. C., Jongedijk, R. A., Van Minnen, A., Elzinga, B. M., & Olff, M. (2018). Development and evaluation of the Dutch clinician-administered PTSD scale for DSM-5 (CAPS-5). *European Journal of Psychotraumatology*, *9*:1546085. doi:10.1080/20008198.2018.1546085

Bottari, S. A., Trifilio, E. R., Janicke, D. M., Porges, E. C., Cohen, R. A., Jaffee, M. S., & Williamson, J. B. (2023). Effects of sleep disturbance on trauma-focused psychotherapy outcomes in posttraumatic stress disorder: A systematic review. *Annals of the New York Academy of Sciences*, *1526*(1), 30-49. doi:10.1111/nyas.15029

Bradley, R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A multidimensional meta-analysis of psychotherapy for PTSD. *Am J Psychiatry*, *162*(2), 214-227. doi:10.1176/appi.ajp.162.2.214

Brady, K. T., Killeen, T. K., Brewerton, T., & Lucerini, S. (2000). Comorbidity of psychiatric disorders and posttraumatic stress disorder. *Journal of Clinical Psychiatry, 61*, 22-32. PMID:10795606

Clapp, J.D., Kemp, J.J., Cox, K.S., & Tuerk, P.W. (2016). Patterns of change in response to prolonged exposure: implications for treatment outcome. *Depression and Anxiety, 33*(9), 807-815.

Currier, J. M., Holland, J. M., & Drescher, K. D. (2014). Residential treatment for combat-related posttraumatic stress disorder: Identifying trajectories of change and predictors of treatment response. *PLoS ONE, 9*(7), e10174. doi:10.1371/journal. pone.0101741

De Beurs, E. (2011). *Brief Symptom Inventory – BSI – Handleiding, herziene editie 2011*. The Netherlands, Leiden: PITS B.V.

Dewar, M., Paradis, A., & Fortin, C. A. (2020). Identifying trajectories and predictors of response to psychotherapy for post-traumatic stress disorder in adults: A systematic review of literature. *The Canadian Journal of Psychiatry*, *65*(2), 71-86.

Dominguez, S. K., Matthijssen, S. J., & Lee, C. W. (2021). Trauma-focused treatments for depression. A systematic review and meta-analysis. *PLoS One*, *16*(7), e0254778. doi:10.1371/journal.pone.0254778

Elliott, P., Biddle, D., Hawthorne, G., Forbes, D., & Creamer, M. (2005). Patterns of treatment response in chronic posttraumatic stress disorder: An application of latent growth mixture modeling. *Journal of Traumatic Stress*, *18*(4), 303-311. doi:10.1002/jts.20041

Fonzo, G. A., Federchenco, V., & Lara, A. (2020). Predicting and managing treatment non-response in posttraumatic stress disorder. *Current Treatment Options in Psychiatry*, *7*(2), 70-87.

Forbes, D., Creamer, M., Hawthorne, G., Allen, N., & McHugh, T. (2003). Comorbidity as a predictor of symptom change after treatment in combat-related posttraumatic stress disorder. *The Journal of Nervous and Mental Disease*, *191*(2), 93-99. doi:10.1097/01.NMD.0000051903.60517.98

Fried, E. I. (2022). Studying mental health problems as systems, not syndromes. *Current Directions in Psychological Science, 31*(6), 500-508. doi:10.1177/09637214221114089

Geier, T. J., Hunt, J. C., Nelson, L. D., Brasel, K. J., & de Roon-Cassini, T. A. (2019). Detecting PTSD in a traumatically injured population: The diagnostic utility of the PTSD Checklist for DSM-5. *Depression and Anxiety*, *36*(2), 170-178. doi:10.1002/da.22873

Haagen, J. F., Smid, G. E., Knipscheer, J. W., & Kleber, R. J. (2015). The efficacy of recommended treatments for veterans with PTSD: A metaregression analysis. *Clinical Psychology Review*, *40*, 184-194.

Jacoby, V. M., Straud, C. L., Bagley, J. M., Tyler, H., Baker, S. N., Denejkina, A., Sippel, L. M., Kaya, R., Rozek, D. C., Fina, B. A., & Dondanville, K. A. (2022). Evidence-based posttraumatic stress disorder treatment in a community sample: Military-affiliated versus civilian patient outcomes. *Journal of Traumatic Stress*, 35, 1072-1086. doi:10.1002/jts.22812

Jongedijk, R.A., van der Aa, N., Haagen, J.F., Boelen, P.A., & Kleber, R.J. (2019). Symptom severity in PTSD and comorbid psychopathology: a latent profile analysis among traumatized veterans. *Journal of Anxiety Disorders*, *62*, 35-44. doi:10.1016/j.jad.2020.01.077

Jongedijk, R.A., Vreeswijk, M.F. van, Knipscheer, J.W., Kleber, R.J., & Boelen, P.A. (2022). The Relevance of Trauma and Re-experiencing in PTSD, Mood, and Anxiety Disorders. *Journal of Loss and Trauma*, doi: 10.1080/15325024.2022.2116782

Jongedijk, R.A., Boelen, P.A., Knipscheer, J.W., & Kleber, R.J. (2023). Unity or anarchy? A historical search for the psychological consequences of psychotrauma. *Review of General Psychology, 27*, 3, 303-319. doi:10.1177/10892680231153096

Kelly, U., Haywood, T., Segell, E., & Higgins, M. (2021). Trauma-sensitive yoga for post-traumatic stress disorder in women veterans who experienced military sexual trauma: interim results from a randomized controlled trial. *The Journal of Alternative and Complementary Medicine*, *27*(S1), S-45. doi:10.1089/acm.2020.0417

Lee, D. J., Weathers, F. W., Thompson-Hollands, J., Sloan, D. M., & Marx, B. P. (2022). Concordance in PTSD symptom change between DSM-5 versions of the Clinician-Administered PTSD Scale (CAPS-5) and PTSD Checklist (PCL-5). *Psychological Assessment*, *34*(6), 604. doi:10.1037/pas0001130

Maercker, A., Bernays, F., Rohner, S. L., & Thoma, M. V. (2022). A cascade model of complex posttraumatic stress disorder centered on childhood trauma and maltreatment, attachment, and socio-interpersonal factors. *Journal of Traumatic Stress*, *35*(2), 446-460. doi:10.1002/jts.22756

Maguen, S., Metzler, T. J., McCaslin, S. E., Inslicht, S. S., Henn-Haase, C., Neylan, T. C., & Marmar, C. R. (2009). Routine work environment stress and PTSD symptoms in police officers. *The Journal of Nervous and Mental Disease, 197*(10), 754. doi:10.1097/NMD.0b013e3181b975f8

Martinmäki, S. E., van der Aa, N., Nijdam, M. J., Pommée, M., & Ter Heide, F. (2021). Treatment response and treatment response predictors of a multidisciplinary day clinic for police officers with PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy*. doi:10.1037/tra0001128

Murphy, D., & Smith, K. V. (2018). Treatment efficacy for veterans with posttraumatic stress disorder: latent class trajectories of treatment response and their predictors. *Journal of Traumatic Stress*, *31*(5), 753-763. doi:10.1002/jts.22333

Phelps, A. J., Steel, Z., Metcalf, O., Alkemade, N., Kerr, K., O'Donnell, M., ... & Forbes, D. (2018). Key patterns and predictors of response to treatment for military veterans with post-traumatic stress disorder: a growth mixture modelling approach. *Psychological Medicine, 48*(1), 95-103.

Queirós, C., Passos, F., Bártolo, A., Marques, A. J., Da Silva, C. F., & Pereira, A. (2020). Burnout and stress measurement in police officers: Literature review and a study with the operational police stress questionnaire. *Frontiers in Psychology, 11*, 587. doi:10.3389/fpsyg.2020.00587

Rentmeesters, N., & Hermans, D. (2023). Posttraumatic stress disorder in Belgian police officers: prevalence and the effects of exposure to traumatic events. *European Journal of Psychotraumatology*, *14*(1). doi:10.1080/20008066.2022.2156558

Rosenkranz, S. E., & Muller, R.T. (2011). Outcome following inpatient trauma treatment: differential response based on pretreatment symptom severity. *Psychological Trauma, 3*(4), 453-461

Schneider, A., Pfeiffer, A., Conrad, D., Elbert, T., Kolassa, I. T., & Wilker, S. (2020). Does cumulative exposure to traumatic stressors predict treatment outcome of community-implemented exposure-based therapy for PTSD?. *European Journal of Psychotraumatology*, *11*(1), 1789323. doi:10.1080/20008198.2020.1789323

Smid, G. E., van der Meer, C. A., Olff, M., & Nijdam, M. J. (2018). Predictors of outcome and residual symptoms following trauma-focused psychotherapy in police officers with posttraumatic stress disorder. *Journal of Traumatic Stress*, *31*(5), 764-774. doi:10.1002/jts.22328

Schmidt, U. (2015). A plea for symptom-based research in psychiatry. *European Journal of Psychotraumatology*, *6*(1), 27660. doi:10.3402/ejpt.v6.27660@zept20.2015.6.issue-s4

Spinhoven, P., Penninx, B. W., Van Hemert, A. M., De Rooij, M., & Elzinga, B. M. (2014). Comorbidity of PTSD in anxiety and depressive disorders: Prevalence and shared risk factors. *Child Abuse & Neglect*, *38*(8), 1320-1330. doi:10.1016/j.chiabu.2014.01.017

Steenkamp, M. M., Litz, B. T., Hoge, C. W., & Marmar, C. R. (2015). Psychotherapy for military-related PTSD: a review of randomized clinical trials. *JAMA*, *314*(5), 489-500. doi.10.1001/jama.2015.8370

Teicher, M.H., Gordon, J.B. & Nemeroff, C.B. (2022). Recognizing the importance of childhood maltreatment as a critical factor in psychiatric diagnoses, treatment, research, prevention, and education. *Molecular Psychiatry, 27*, 1331–1338. doi:10.1038/s41380-021-01367-9

Van der Meer, C. A., Bakker, A., Schrieken, B. A., Hoofwijk, M. C., & Olff, M. (2017). Screening for trauma-related symptoms via a smartphone app: The validity of Smart Assessment on your Mobile in referred police officers. *International Journal of Methods in Psychiatric Research*, *26*(3), e1579. doi:10.1002/mpr.1579

Van Praag, D. L., Fardzadeh, H. E., Covic, A., Maas, A. I., & von Steinbüchel, N. (2020). Preliminary validation of the Dutch version of the Posttraumatic stress disorder checklist for DSM-5 (PCL-5) after traumatic brain injury in a civilian population. *PloS One*, *15*(4), e0231857. doi:10.1371/ journal.pone.0231857

Walter, K. H., McCabe, C. T., Watrous, J. R., Kohen, C. B., Beltran, J. L., Kirk, A., & Campbell, J. S. (2022). Psychological comorbidity: Predictors of residential treatment response among US service members with posttraumatic stress disorder. *Journal of Traumatic Stress, 35*(5). doi:10.1002/jts.22838

Weathers, F.W., Litz, B.T., Keane, T.M., Palmieri, P.A., Marx, B.P., & Schnurr, P.P. (2013). The PTSD Checklist for *DSM-5* (PCL-5). Scale available from the National Center for PTSD online at www.ptsd.va.gov

Weathers, F.W., Bovin, M.J., Lee, D.J., Sloan, D.M., Schnurr, P.P., Kaloupek, D.G., Keane, T.M. and Marx, B.P. (2018). The Clinician-Administered PTSD Scale for DSM–5 (CAPS-5): Development and initial psychometric evaluation in military veterans. *Psychological Assessment*, *30*(3), 383-395. doi:10.1037/pas0000486

SUPPLEMENTARY MATERIAL

Supplementary Table 1. Linear mixed models analysis of pre-treatment PTSD symptom clusters predicting change in PTSD symptom cluster B (re-experiencing symptoms) during treatment.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model Criterion B (n=236)						
Intercept	4.186	1.328			1.576	6.797
Time	3.505	1.463	2.396	.017	0.621	6.390
Intrusion	0.014	0.127	0.113	.910	-0.236	0.264
Avoidance	-0.437	0.247	-1.771	.078	-0.924	0.050
Negative alterations in cognitions and mood	0.041	0.099	0.411	.682	-0.154	0.236
Arousal	0.082	0.130	0.633	.527	-0.173	0.337

Supplementary Table 2. Linear mixed models analysis of pre-treatment PTSD symptom clusters predicting change in PTSD symptom cluster C (avoidance symptoms) during treatment.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model Criterion C (n=236)						
Intercept	2.478	0.647			1.205	3.751
Time	1.357	0.732	1.854	.065	-0.086	2.800
Intrusion	-0.103	0.064	1.623	.106	-0.228	0.022
Avoidance	-0.009	0.124	-0.072	.942	-0.253	0.235
Negative alterations in cognitions and mood	-0.004	0.050	-0.087	.931	-0.102	0.093
Arousal	0.085	0.065	1.302	.194	-0.043	0.213

Supplementary Table 3. Linear mixed models analysis of pre-treatment PTSD symptom clusters predicting change in PTSD symptom cluster D (negative cognitions and mood symptoms) during treatment.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model Criterion D (n=236)						
Intercept	6.344	1.762			2.880	9.809
Time	3.691	1.996	1.850	.066	-0243	7.626
Intrusion	-0.117	0.173	-0.677	.499	-0.459	0.224
Avoidance	-0.613	0.337	-1.816	.071	-1.278	0.053
Negative alterations in cognitions and mood	0.341	0.135	2.528	.012	0.075	0.608
Arousal	0.066	0.177	0.374	.709	-0.283	0.415

Supplementary Table 4. Linear mixed models analysis of pre-treatment PTSD symptom clusters predicting change in PTSD symptom cluster E (arousal symptoms) during treatment.

					95% confidence interval of B	
	B	SE B	t	p	Lower	Upper
Model Criterion E (n=236)						
Intercept	7285	1.470			4.395	10.176
Time	3.951	1.650	2.394	.018	0.697	7.205
Intrusion	-0.078	0.143	-0.546	.586	-0.360	0.204
Avoidance	-0.611	0.279	-2.192	.030	-1.161	-0.061
Negative alterations in cognitions and mood	0.053	0.112	0.473	.637	-0.167	0.273
Arousal	0.259	0.146	1.768	.079	-0.030	0.547

Cyril: 'But you don't mean to say that you seriously believe that Life imitates Art, that Life in fact is the mirror, and Art the reality?'
Vivian: 'Certainly I do. Paradox though it may seem — and paradoxes are always dangerous things — it is none the less true that Life imitates Art far more than Art imitates Life. (…).
A great artist invents a type, and Life tries to copy it, to reproduce it in a popular form, like an enterprising publisher.' [13]

13 Retrieved from p. 47: Oscar Wilde (1889). The Decay of Lying: A Dialogue. *The Nineteenth century and after: a monthly review*, *25* (143), 35-56.

Summary and discussion

7

7.1 INTRODUCTION

The aim of this dissertation is to contribute to the understanding of a number of conceptual issues regarding potential trauma events (PTEs) and their psychological consequences, including post-traumatic stress disorder (PTSD). We examined, among others, how PTSD as a diagnostic concept has been constructed, how it originated, what it is based on, how it manifests, and how it relates to other mental disorders. To this end, we have formulated four research questions (see ***Paragraph 1.5***). In this chapter, the main findings of the studies are summarized and discussed, after which a proposal is made for an alternative diagnostic model for trauma-related disorders.

7.2 SUMMARY

The dissertation started with a brief outline of the problems that clinicians may encounter in daily practice when it comes to the heterogeneity of the symptomatology after PTEs (***Chapter 1***). In addition, changes in the defined concepts of PTEs and PTSD over the years were briefly discussed. The chapter ended with the objectives, relevance, and research questions.

A HISTORICAL SEARCH (CHAPTER 2)

Today, there is disagreement about the consequences of traumatic experiences, as can be seen, for example, in the differences between the definitions of PTSD in the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD), Yet, in the past, researchers and clinicians struggled with the same issues. The scientific literature on psychotrauma in the last century has been described as 'lacking continuity' or even as being in a 'state of anarchy'. This prompted us to conduct a historical review of the literature on psychotrauma, with the aim of investigating how posttraumatic symptoms and syndromes evolved and changed over time, and under what circumstances and influences this took place.

In our findings we saw four important trends over the past century and a half in scientific literature on psychotrauma. First, we found that a wide variety of *symptoms* were described after PTEs, leading to frequent scientific debates about how a posttraumatic stress syndrome should be defined. Second, a proliferation of definitions of post-traumatic *syndromes* were found. We could distinguish three categories of syndromes: 1) an acute, short-term syndrome, 2) a longer lasting one, and 3) a more complex defined syndrome with a wide range of symptoms. Although we found this common thread, the disorders that fell within one of the three categories were generally defined very differently in terms of symptomatology. Thirdly, we often found fierce disputes about the origin of posttraumatic syndromes. The disagreements revolved around whether the cause was physical, psychological, or coming from simulation or 'weak will', but also whether the cause was the traumatic experience itself or largely an already existing

mental or physical vulnerability. And fourth, there was a repeated pattern of time-bound, often social, societal, legal, and personal forces that influenced the characteristics, backgrounds and definitions of the post-traumatic concepts.

Why this variety of symptoms and syndromes emerged differently over the years is explained by labeling posttraumatic symptomatology as the result of an interaction between time-bound social, political, legal, scientific, and medical paradigms that influences scientists, clinicians, and the patients themselves. We concluded that flexibility in trauma diagnostics is needed, because there probably is no universal, timeless, unambiguous, and sharply defined posttraumatic stress disorder but an ever-changing, ever adapting one.

THE STRESSOR CRITERION (CHAPTER 3)

The 'traumatic stressor criterion' or 'Criterion A' of PTSD according to the DSM, also often named as 'potentially traumatic event' (PTE) is subject to much debate in the literature. This is reflected, among other things, in the fact that the definition of a PTE has been subject to change: Criterion A has been continually amended in successive editions of the DSM. Another discussion about PTEs is the unclear relationship of these PTEs with PTSD. And finally, it has been convincingly shown that people who have experienced a PTE often do not specifically develop PTSD, but often other mental disorders.

Our study in Chapter 3 was conducted in a heterogeneous sample of treatment seeking patients in a general mental health care outpatient clinic. Our first study objective was to determine the relevance of the way PTEs are defined by formulating three PTE definitions in *increasing degrees of impact*, using the criteria of the DSM-IV (see Table 2, Chapter 1). One of our findings was that the higher the impact of the PTEs was defined, the higher the prevalence of PTSD was. Furthermore, we found that patients who reported a history of higher PTE impact used mental health support more than patients who reported PTEs with less impact.

Our second objective was to investigate the relationship between the three PTE definitions and the prevalence of psychopathology, in particular PTSD and anxiety and mood disorders. We found that the likelihood of being diagnosed with PTSD increased from lower-impact PTEs to higher-impact PTEs. Another finding was that almost half (47%) of patients with an anxiety disorder or a depressive disorder *without* PTSD, reported PTEs in their lives. Moreover, 13% of patients with only a depressive disorder reported frequent re-experiencing symptoms compared to 5.9% in patients with anxiety disorders.

We concluded that the way in which PTEs are defined influences the prevalence of PTSD, but how exactly this definition may be changed is still up for debate. We have proposed an alternative, dimensional model for PTEs, which includes a *quantitative* grading (e.g., number, severity, duration) as well as a *qualitative* grading (e.g., suddenness, lack of control, perceived life threat, or interpersonal violence). In addition, clinicians should be aware that PTEs and reexperiencing symptoms do not only occur in patients with PTSD but can also occur in patients with several other mental disorders.

HETEROGENEITY IN SYMPTOM PROFILES (CHAPTERS 4 AND 5)

Clarifying the heterogeneity in post-traumatic psychopathology can contribute to knowledge, not only in recognition and diagnosis, but also in treatment approaches in traumatized patients and may contribute to treatment modifications in order to enhance treatment effectiveness. After all, not all patients with PTSD benefit equally from treatment and up to 75% retain significant residual symptoms after completing treatment (Larsen et al., 2019).

In two studies, we conducted Latent Profile Analysis (LPA) to explore whether subgroups could be identified based on endorsement of different symptom profiles. One of our research questions was whether or not the possible subgroups encountered would differ in the *nature* of symptoms. That could indicate that the diagnosis and treatment approach need to be adjusted depending on the variation in symptom profiles, for example if treatment effectiveness needs to be improved. However, if subgroups differ only in terms of overall symptom severity across diagnostic boundaries, this may indicate that assessment and treatment approaches should primarily focus on common, transdiagnostic factors underlying the different disorders. We also studied the correlates of subgroup membership like e.g., the number and characteristics of PTEs, coping styles, gender, and personality dimensions.

In ***Chapter 4***, we examined a sample of traumatized, treatment seeking Dutch veterans. We used the measures of the severity of a broad spectrum of general psychopathology and of PTSD symptoms. For the correlates, we investigated coping styles, personality characteristics, and number of PTE types. Three subgroups of patients were identified which could be characterized by differences in *overall* symptom severity profile: an 'average', a 'severe', and a 'highly severe' symptom severity subgroup. This meant that the scores of general psychopathology *and* PTSD were closely related in terms of severity. Next, we found that veterans in the two severe symptom subgroups reported a higher amount of traumatic event types (in particular, traumatic events associated with 'lack of basic human needs') and had higher levels of avoidant coping and dysfunctional personality traits, particularly neuroticism, than veterans in the average group.

In ***Chapter 5***, we studied a large sample of treatment seeking, traumatized refugees and we took into account an even wider range of symptoms of psychopathology: the total PTSD symptom severity scores, the severity of the three distinct PTSD symptom clusters of DSM-IV (re-experiencing, avoidance, and hyperarousal), and anxiety, depression, and somatic symptoms. Next, we investigated whether membership of a specific subgroup was associated with exposure to PTE types and gender. Our main findings were consistent with those of the veteran study: again, we found three subgroups and again, we only found differences between the subgroups regarding overall symptom severity, and no qualitative differences. This applied not only to the total PTSD and the severity of depression and anxiety symptoms, but also to the three distinct symptom clusters of PTSD and to somatic symptoms. Furthermore, a greater number of PTE types as well as those related to 'lack of human needs' and 'human rights violations' were more frequently reported in the more severe symptom subgroups. Also, female refugees were significantly more often in the highly severe symptom subgroup.

In short, we found a broad symptom profile of psychological distress in which symptoms of

PTSD and symptoms of general psychopathology were closely related to each other. This supports the notion that symptoms and disorders, especially in severely traumatized patients with long-term complaints, should be seen within a broader framework of posttraumatic psychopathology than just PTSD.

ASSOCIATIONS BETWEEN PTSD CRITERIA AND TREATMENT OUTCOME (CHAPTER 6)

The heterogeneity of disorders can be viewed in terms of adjacent or comorbid symptoms in addition to PTSD, as was largely done in Chapters 4 and 5. However, PTSD itself covers a wide range of symptoms, and is probably the most heterogeneous disorder of the DSM-5 (Galatzer-Levy & Bryant, 2013; Hoge et al., 2016). As previously noted, a significant proportion of patients with PTSD respond insufficiently to trauma treatment and many retain residual symptoms. This led us to look at possible factors *within* the PTSD concept that could influence treatment results.

In the research described in Chapter 6 we conducted Linear Mixed Model analyses (LMMs) in a sample of traumatized veterans and police officers with long-term mental complaints. We examined whether two qualitative characteristics of Criterion A (direct exposure versus indirect exposure and interpersonal versus non-interpersonal exposure to a traumatic event) and the four DSM-5-based clusters of PTSD (Criteria B-E) were associated with: 1) the severity of symptoms of PTSD and general psychopathology before treatment, 2) change in PTSD and general psychopathology from pre-treatment to post-treatment, and 3) change in the four distinct PTSD symptom clusters from pre-treatment to post-treatment.

We found that 51% of the participants reported improvement for PTSD symptoms and 45% for symptoms of general psychopathology after treatment. It follows that a significant proportion of patients did not improve. This made it all the more important to investigate whether specific components of PTSD were associated with treatment outcome. The nature of the PTEs did not influence treatment outcome. The reasons for this may be, firstly, that this patient group has experienced so many different types of trauma that a distinction between the PTEs is no longer demonstrable. Second, the influence of the PTEs will likely have been overshadowed by the many stress factors that have arisen during the long period of complaints. Also, the distinct PTSD symptom clusters were not associated with treatment outcome. Only *higher* pre-treatment severity of cluster D (negative alterations in cognitions and mood) was associated with *greater* improvement in general psychopathology. Finally, we found that especially a higher pre-treatment severity of symptom cluster D might be associated with *better* improvement on that same cluster D from pre- to post-treatment and *higher* pre-treatment symptom severity in cluster C (avoidance symptoms) with *less* change from pre-treatment to post-treatment in cluster E (symptoms of arousal).

In short, we found no convincing evidence that certain components of PTSD were associated with changes in total PTSD symptoms between pre- and post-treatment. Because a significant proportion of patients did not improve, other factors should play a role in relation to treatment outcome. We discussed the fact that the symptom clusters of PTSD are still very heterogeneous, with two to even seven symptoms and hypothesized that specific symptoms

within these clusters would require further investigation in relation to treatment outcome. Finally, it is likely that more context-related factors are associated with treatment outcome, such as psychosocial factors including living conditions, aspects of personality including coping and neuroticism, or a history of trauma and social-emotional neglect in childhood.

7.3 DISCUSSION

In this discussion we will reflect on our findings. First, an overview is given of how mental disorders can be viewed. Various perspectives are possible here, some of which differ widely. Such divergent views can easily lead to disagreement about what exactly a mental disorder such as PTSD 'is'. This ties in with the central theme in this dissertation. Next, we will reflect on the meaning of PTEs and symptom heterogeneity, and finally we will make a proposal to improve diagnostics.

7.3.1. HOW ABOUT THE 'REALNESS' OF PTSD: A REFLECTION

Popularity and debate

As stated in the introduction to this dissertation, since its introduction in 1980 PTSD has become extremely popular among clinicians, researchers, patients, as well as in the public and the media. Some argue that we are in the 'Age of Posttraumatic Stress Disorder' in which PTSD has become so embedded in current culture and medicine, that it is easy to forget that the idea that traumas can cause mental disorders is a relatively new notion (Horwitz, 2018, p.3). Since 1980, PTSD has flourished as a diagnostic category and, in fact, can no longer be ignored. There is even something strange about PTSD as was pointed out back in 1995 by the influential psychiatrist Andreasen: '*It is rare to find a psychiatric diagnosis that anyone likes to have, but PTSD seems to be one of them.*' (Andreasen, 1995, p. 963). She meant that individuals would not so much want PTSD, but that they would prefer PTSD over other mental disorders. This assumption can be partly explained by the genesis of PTSD and the characteristics of the diagnosis that resulted from it, as we described in ***Chapter 2***. PTSD anchored the disruptive symptoms and behaviors that traumatized individuals exhibited to tangible external events without giving them a stigma of mental illness. Moreover, it often brought them specific medical and psychological care, financial compensation, and social recognition and compassion for their experiences (e.g., Horwitz, 2018; Lerner & Micale, 2001). In particular, the suggestion that the cause of psychological complaints lies with an external factor and not with an intrinsic vulnerability as is assumed in other psychological disorders, is most likely an important factor in the popularity of PTSD.

Yet, it is not so clear why professionals and public opinion started to embrace the concept so heavily. Perhaps because, especially in Western countries, an increasingly individualized society emerged, with a changing view of the relationship of individuals with their environment, in which concepts such as victimhood, vulnerability and humanity became increasingly central. Under such circumstances, the shocking consequences of drastic, gruesome events

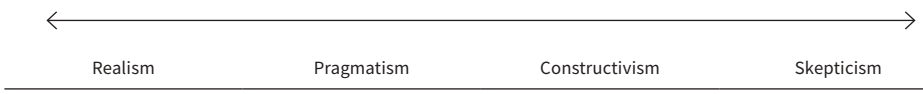
can more quickly mobilize a sense of horror, individually but especially socially, causing great involvement of the people around those affected. Illustrative of the increasing popularity of PTSD among clinicians and researchers is the statement by Lerner and Micale (2001, p. 3) that from the beginning of the twenty-first century, PTSD is perhaps the fastest growing diagnosis in American psychiatry. The popularity and perceived benefits of PTSD, from professional, social and patient perspectives, imply that abolishing the PTSD classification is no longer desirable or even possible today. But that does not necessarily mean we should embrace the diagnostic concept uncritically.

Particularly in the scientific field, psychotrauma and its consequences have always been a subject of discussion and have often been seriously questioned. The many disagreements can arise from different points of view. For example, whereas several clinicians and researchers believe that PTSD is a timeless and universal disorder, others question the concept and argue that PTSD is better viewed from as a temporary phenomenon, caused by social and cultural forces. These very contradictory views (and all views in between) have significantly fuelled the controversy surrounding trauma and PTSD. To put these angles in a broader perspective, it is illuminating to look at existing theories regarding the question about the *'realness'* of mental disorders.

Dimensions of realness

This realness can be described on a scale that runs in degrees of realness: from 'realism' via 'pragmatism'' to 'constructivism' (Kendler, 2016; Zachar & Kendler, 2017). We added the degree of 'skepticism' because we found a high degree of skepticism and resistance towards trauma-related disorders, especially in our historical study in ***Chapter 2*** (Figure 7.1).

Figure 7.1. Dimension of 'realness' concerning the nature of mental disorders.



First, ***realism*** implies that diagnoses actually exist, with a (biological) cause and are independent of perceptions and influences from outside. There are certainly medical diseases that are 'real', in the way that they can be clearly and objectively demonstrated by diagnostic tools, for example appendicitis, broken leg, or eczema. However, in medical science, several diseases are not objectifiable. In these disorders, there is usually no anatomical or physiological substrate with which to substantiate or demonstrate the disorder. This is especially true for mental disorders, making it difficult to determine the nature of these disorders. In the case of PTSD, many attempts are made to biologically substantiate the disorder and thus demonstrate its 'realness'. The views of proponents of a realist position can be outlined with the following

quote, which clearly takes a stand against a politically or socially influenced conceptualization of PTSD: '*Biological findings have provided objective validation that PTSD is more than a politically or socially motivated conceptualization of human suffering.*' (Yehuda and McFarlane, 1997, cited in McNally, 2004, p. 10).

Second, ***pragmatism*** means that diagnoses are more a way of organizing symptoms related to patient's complaints, to be able to move forward in practice: one can name, intervene and possibly predict the course of diagnosis. It does not matter whether a diagnosis has a basis of reality, as long as it works. This is roughly how the DSM is set up, namely as a product that emerged from various historical lines with its nosology driven more by practical needs and historical contingencies than by internal consistency (Aftab & Ryznar, 2020).

Thirdly, ***constructivism*** accepts realism, but emphasizes that external factors in particular have a significant influence on the diagnosis. For instance, Young (1995, p. 5) argued that PTSD *'… is not timeless, nor does it possess an intrinsic unity. Rather, it is glued together by the practices, technologies, and narratives with which it is diagnosed, studied, treated, and represented and by the various interests, institutions, and moral arguments that mobilized these efforts and resources.*' But he continues his argument with an important sequel, in which he states that this certainly does not mean that PTSD is not real. Rather, he argues, the reality of PTSD has been empirically confirmed by its place in people's lives, by their experiences and beliefs, and by the personal and collective instruments that have emerged from it. This process is called *reification*, where constructed concepts such as mental disorders are seen as 'real', that is, with a high degree of reality, without taking into account alternative approaches (Hyman, 2010; Kleber et al., 2013).

As one step further in the 'realness scale', we propose a fourth option: PTSD is purely affected by social and cultural forces and is in fact a misdiagnosis. We label this view as ***skepticism***. Skepticism on trauma already existed at the beginning of the last century. The German psychiatrist Alfred Hoche, a staunch opponent of 'traumatic neurosis', expressed this skepticism in strong terms in 1910. He stated that '*thirty years ago*' trauma was an unknown concept, but today it is a disease of the entire working class, like a cancerous tumor for the organism, and a cause for serious concern. He identified trauma as a national epidemic, which had a direct causal relationship with the enactment of Bismarck's accident insurance legislation. Thus, he stated: '*The law has, there is no doubt, produced the illness. (….) The individuals are in fact sick, but they would be well (….) if the law did not exist.*' (in: Lerner, 2001, pp. 150-151). But even more recently, some scholars judged very harshly about PTSD, such as the historian Shepard (2004). He called for the dismantling of the unitary concept of trauma. For example, he argued that any classification that simultaneously encompasses such diverse experiences, as from surviving Auschwitz to hearing crude jokes at work, must be a nonsensical, even absurd, classification by any reasonable standard. We can also consider the psychiatrist Summerfield who calls PTSD a 'pseudo-disorder'. He identified a real 'trauma industry', a social movement based on medical explanations where the interaction between a committed psychiatrist and a suffering person can easily lead to the diagnosis of PTSD, if, for

example, lawyers and legal rules require it (Summerfield, 2001).

Ever-changing pattern of symptomatology

Knowledge of these four perspectives on the diagnostics of mental disorders is important to clarify the many points of view and resulting discussion points surrounding the diagnosis of PTSD. The so-called 'realists' and 'skeptics' will find little in common in the discussion about the *realness* of PTSD. The 'constructivists', on the other hand, can fulfill an important bridging function. Constructionism does not necessarily mean defining mental disorders solely based on social and cultural factors, as some constructionists argue. In a more nuanced perspective, a bridge can be built to the realists by adding that there can certainly be a *biological substructure* for a mental disorder, but that history shows that this substructure will always have an *interpretive superstructure* that reflects the manifestations of the disorder (Horwitz, 2018). This *interpretive superstructure* shapes not only the visible manifestations of the symptoms, but also the ever-changing symptomatology across eras.

In this view, the manifestations of posttraumatic psychopathology are shaped by the paradigms of the specific time period. The symptoms, part of what is called the 'symptom pool', manifest themselves in some periods and are barely visible in other periods (Shorter, 1993). Patients as well as clinicians unconsciously model complaints in such a way that they fit within the social and cultural, but also within the clinical and scientific paradigms of the time in which they live. In the relationship between patient and clinician, this means that the patient will formulate his complaints according to the current social, cultural, and professional discourse and that the clinician will interpret and classify the complaints according to this same discourse. In this way, PTSD can be seen as a disorder that is continuously shaped by social forces and paradigms, of which both physicians and patients are part of and influenced by (Horwitz, 2018; McNally, 2004).

In the case of trauma and its consequences, we can see several examples of the ever-changing pattern of symptomatology over time. For example, in the era of the 'Soldier's Heart' (the 1860s), psychological symptoms following PTEs were not known or accepted. At that time, the heart provided a culturally acceptable basis for health related symptoms. Later, in the years of the Industrial Revolution, a mechanistic worldview dominated, with central disease concepts such as 'hysteria' (with many neurological complaints) and 'neurasthenia' (with complaints of fatigue and exhaustion). This was followed by 'Shell Shock', described in the First World War, where, in contrast to hysteria, an attempt was made to find a clear external cause for the physical complaints of the (male) soldiers. In the Second World War, in addition to existing physical complaints, the concept of 'anxiety' was also described among combat soldiers (Grinker & Spiegel, 1945). Later in the twentieth century, much more emphasis was placed on mental symptoms and memory processes. As a result, theories came to the fore with 'traumatic memory' as an underlying mechanism, 'traumatic event' as an etiological factor and 're-experiencing' as a consequence (Bracken, 2001). One could speculate that a new trend is starting in recent years. Possibly because 'humanity' is seen as an important value in modern

Western society, there seems to be a gradual shift towards more attention for moral factors of trauma, such as guilt, shame, and moral aspects or dilemmas (Litz & Kerig, 2019).

7.3.2. DISCUSSION ON POTENTIALLY TRAUMATIC EVENTS (PTES)

Conceptual reflections

The definitions of PTEs were subject to changes in successive DSM (and ICD) editions. This can have had consequences, especially for individual cases: the experiences of some patients may suddenly no longer meet the definition of criterion A, as a result of which they no longer meet the criteria for PTSD. This is in line with the findings from our study (***Chapter 3***).

We argued that the categorical definition of Criterion A is too rigid and offers little flexibility. Flexibility can be important to nuance the all-or-nothing principle. Moreover, in our studies we have shown that both the severity and the nature of the traumatic events can play a role in, for example, the severity of mental complaints and individual (dys)functioning (e.g., Boudoukha et al., 2017) (***Chapters 3***, ***4***, and ***5***). Therefore, we propose to define PTEs in an alternative, more meaningful and personalized way for both clinician and patient, i.e., in both a quantitative and in a qualitative manner. For this purpose, we have identified, from our studies and from the literature, features belonging to both a quantitative (e.g., total number, variety in characteristics or trauma types, severity, duration) and a qualitative gradation (e.g., suddenness, lack of control, perceived life threat, or interpersonal violence) (Table 7.1).

Table 7.1. A dimensional way of looking at degrees of PTEs.

Quantitative dimensions:
Number of (total) PTEs
Number of types (different nature) of PTEs
Duration of PTEs
Proximity to PTEs
Qualitative dimensions:
Lack of control during PTEs
Perceived powerlessness during PTEs
Suddenness of PTEs
Perceived life threat during PTEs
Interpersonal PTEs
Combat related PTEs
Age in which PTEs took place (developmental vulnerability)
Lack of human needs / Human rights violations

We investigated the definition and influence of PTEs in Chapters 3, 4, 5, and 6. In ***Chapter 3*** we showed that, especially in a *quantitative* sense, the way in which the trauma definition is formulated is relevant for the mental consequences and the use of mental health care. In ***Chapters 4*** and ***5*** it was found that specific features of PTEs are relevant to symptom

severity, such as 'lack of human needs' and 'human rights violations'. Finally, in ***Chapter 6*** we showed that two qualitative characteristics of trauma, namely direct vs indirect traumatization and interpersonal vs non-interpersonal traumatization, were unrelated to treatment outcome. Regarding this latter study, it is important to note that the study sample consisted of multiple traumatized patients. This may make the distinction between these individual characteristics of PTEs less relevant, which has also been shown by previous authors (O'Donnell et al., 2004).

Chapter 3 indicated that the relationship between a PTE and a pattern of complaints consistent with PTSD is not as clear as is often suggested and as reflected in the DSM-5 (APA, 2013). We found, consistent with previous literature (e.g., Neuner, 2023), that there are many other mental disorders (in our study, especially unipolar mood disorders) that are associated with PTEs. This reflects the fact that the consequences of PTEs can range from no complaints to various other mental disorders, of which PTSD is one.

Moreover, we found that the re-experiencing symptoms, which are often specifically associated with PTSD, are not specific to PTSD, but also occur in mood disorders and, to a lesser extent, in anxiety disorders. This is in line with existing literature, where very few symptoms are pathognomonic for one or the other disorder (Forbes et al., 2023) and where intrusive recollection of memories is considered a transdiagnostic phenomenon (Neuner, 2023). Defining these re-experiencing symptoms, but also PTEs, as specifically belonging to PTSD, and even creating a new chapter in the DSM-5 called 'Trauma- and Stressor-Related Disorders', suggests in our opinion too much that PTSD is the most decisive trauma diagnosis in the DSM-5. This can lead to diagnostic errors: clinicians may be too quick to diagnose PTSD if PTEs are present or if the patient reports reexperiencing symptoms. Or to put it another way: other mental diagnoses are easily neglected.

Finally, more in general, one may state that although PTEs are important, too much weight is generally given to them. Other factors play a role in the development of psychopathology, and these should be considered and weighed next to the prevalence of PTEs. First, many adverse events in an individual's life do not officially fall under Criterion A and are often named under the heading 'Social emotional neglect in (early) childhood', including experiences such as failure to respond to the child's emotional needs, acts of rejection, social exclusion or isolation, degradation, and humiliation. These experiences can have profound and long-lasting effects on physical health and mental health (Boullier & Blair, 2018; Neuner, 2023; Teicher et al., 2022). Second, as noted earlier, many other factors influence the impact of PTEs on psychopathological outcomes (see e.g., ***Chapters 4*** and ***5***). These include, for example, *personality factors* (e.g., coping, neuroticism, and attachment styles) and *context related factors* (social support, psychosocial problems, or the stress that psychopathology itself causes) (Keyan et al., 2024). And third, overarching social, cultural, geographical, and scientific paradigms have a significant influence on the definition of psychopathology, that is, on the way PTEs and post-traumatic symptoms are perceived, interpreted, defined, and hence how they manifest themselves in the patient-clinician relationship and in the life of the individual (see ***Chapter 2*** and ***Paragraph 7.1***).

Clinical implications

We make a plea to weigh PTEs more on qualitative and quantitative aspects, as shown in Table 7.1. Quantitative aspects PTEs, such as the duration of the traumatization, the number of PTEs experienced, or the moment of traumatization in the life course can influence the nature and severity of the complaints. A single event such as a robbery will have different consequences on an individual than a long period of sexual abuse or torture. It follows naturally from this comparison that qualitative aspects of PTEs will also have an influence on the pattern of complaints, such as proximity (e.g., seeing a stabbing versus being a victim of one yourself) or, for example, interpersonal aspects of PTEs (e.g., sexual trauma versus a car accident) (Contractor et al., 2018). Not all aspects described in Table 7.1 will be equally relevant, and it is therefore a task for future research to determine which of the trauma dimensions are most relevant. In addition to a more personalized way of describing PTEs, it is important that physicians realize that a large number of stressors and other factors will influence the nature and severity of post-traumatic complaints. Because these do not have a clear place in the DSM diagnosis (in contrast to the prominent place of PTEs according to Criterion A of PTSD), they can easily fade into the background. However, it may be essential for treatment to target these factors.

Moreover, care must be taken not to diagnose PTSD too quickly in patients with PTEs and/or with re-experiencing symptoms. Such a quick kind of diagnostic approach is called the '*top down*' method of diagnosing: the diagnostician identifies a few important symptoms and immediately proceeds to investigating the other criteria for the (possibly) associated disorder. However, many symptoms of PTSD also occur in other mental disorders and are therefore not specific to that particular disorder. For example, depressive disorders, anxiety disorders, and trauma- and stressor-related disorders have a lot of overlap in their symptomatology: insomnia, difficulty concentrating, depressed mood, anxiety, re-experiencing or agitation occur in many different DSM disorders but especially in these three (Allsopp et al., 2019; Forbes et al., 2023). The classic and in fact only correct diagnostic method is the '*bottom-up*' diagnosis: all symptoms are investigated, analyzed and, if possible, grouped and assessed in context (McHugh & Treisman, 2007). From there, diagnostic hypotheses can be formulated, after which categorization can be performed. Only after this procedure, assessment can take place with 'top down' measuring instruments to categorize whether the grouping of symptoms actually correspond to the disorder in question, for example with diagnostic interviews like the Clinician-Administered PTSD scale for DSM-5 (CAPS-5).

Finally, important questions arise regarding treatment. If various mental disorders are associated with a history of PTEs and with re-experiencing symptoms, what will be the treatment approach? In this context, the formulation of a trauma-related subtype of depression may be relevant (Flory & Yehuda, 2015; Harald & Gordon, 2012). One may wonder whether, in this case, a trauma-focussed treatment (TFT) is indicated for this depression variant, targeting the most prominent symptoms of re-experiencing. Or maybe this condition should be treated with treatment methods that are more in line with depressive disorders. Or maybe both are needed? To date, there are no clear answers to these questions. In general, the trauma-related

subtype of depression will be neglected because it does not appear in current classification systems. As a result, the diagnosis of PTSD will be made earlier and this will influence the treatment approach. A more comprehensive diagnostic model, as described later in this dissertation (7.4), may help to pay more attention to the most disruptive symptoms in clinical practice, even if they do not fit within the diagnostic category.

7.3.3. DISCUSSION ON SYMPTOM HETEROGENEITY

In many of our studies, a high degree of heterogeneity in posttraumatic symptomatology was found. In our historical study (***Chapter 2***) we found many differently defined syndromes with many varying symptomatology over the decades. In particular, in both our studies with LPA (***Chapters 4*** and ***5***), we showed that the reported symptoms were not limited to those belonging to PTSD, but spanned several diagnostic categories, with in addition to PTSD symptoms, also depression, anxiety and somatization. In addition, we found three subgroups based on symptom severity, with only quantitative and no qualitative differences between the subgroups: symptoms of anxiety, depression and somatization were closely related to PTSD.

Heterogeneity and chronic course

There are indications that heterogeneity is less common in some traumatized patient groups than in others. Contractor and colleagues (2017) found that particularly in patients with milder, lower levels of PTSD symptom severity, subgroups with predominant PTSD severity and predominant depression severity could be distinguished. Moreover, and important for our findings, PTSD and depression appeared to be separate entities in the earlier phases after PTEs, while the distinction between the two became less clear as symptomatology persisted (O'Donnell et al., 2004). This may explain why we found a high degree of heterogeneity in our studies. After all, both our LPA-studies involved treatment-seeking patients with both *severe* and *long-standing* post-traumatic symptomatology. This point of view will therefore have consequences for the diagnostic process: although we must classify mental disorders according to the classification systems into strictly defined and demarcated mental disorders, especially patients with long-standing complaints often do not present their complaints in a strict and defined manner and the boundaries between diagnostic categories are often blurred (Allsopp et al., 2019; Olbert et al., 2014). For example, Armenta and colleagues (2019) found in a military sample that comorbid PTSD and depressive symptoms were highly correlated. Moreover, they found four different longitudinal trajectories, namely those termed 'rapid recovery', 'gradual recovery', 'relapse', and 'chronic'. Membership of the chronic group was associated with physical and combat violence, disabling injuries, childhood trauma, and with more anxiety, physical pain, somatic symptoms, and less social support. Patients from this chronic group will most likely need a different, more multidisciplinary treatment approach including medical care than patients from, for example, the 'gradual recovery' patient group (see ***Paragraph 7.4.2***).

The association between heterogeneity and a chronic course of trauma-related

psychological problems is related to several factors which have also been described previously in this dissertation: PTE characteristics and associated influencing factors such as (lack of) social support, poor living conditions, dysfunctional coping, previously experienced adverse experiences, and current comorbid mental, psychosocial and physical problems. In addition, as a result of their (mental) vulnerability, patients with long-term complaints often experience a negative impact on their mental health due to the many post-trauma stressors experienced (Smid et al., 2013). A variety of these stressors can occur in traumatized patients, such as daily stressors, displacement-related stressors (e.g., in refugees) (Hou et al., 2020; Miller & Rasmussen, 2017), and post-deployment stressors (e.g., in veterans) (Sharkansky et al., 2000). However, an important and often neglected stress factor is caused by the debilitating mental health complaints themselves, such as anxiety complaints and sleep disturbances, which will significantly disrupt patients. All these factors together play a role, especially in patients with long-term course of their trauma-related psychological complaints: posttraumatic psychopathology will not only be fueled by the PTEs experienced in the past, but will often be exacerbated and broadened by a multitude of stressors long after the PTEs have been experienced.

In some cases, this can lead to a downward spiral, involving a decline in mental and social health, gradual loss of adaptive abilities, lower levels of social adjustment, or declining levels of physical health. This has been labeled as a 'cascade model' (Alarcon et al., 1999; Maercker et al., 2021), 'Posttraumatic Decline' (Tichener, 1986), or 'Posttraumatic Demoralization' (Parson, 1990).

Heterogeneity and diagnostic classification

In case of PTSD, the longitudinal perspective is addressed to a limited extent in the DSM-5 where there is an acute, a chronic, and a delayed onset form of PTSD. However, the nature of the symptomatology in these cases is defined exactly the same (APA, 2013). In our historical review (***Chapter 2***) we found a proliferation of described syndromes after PTEs and a large diversity of symptoms. But also in the past, these posttraumatic symptoms and syndromes were not defined as evolving and changing throughout life.

To cope with the symptom heterogeneity of traumatized patients, the DSM-5 has chosen to capture the majority of these symptoms within one large, overarching diagnostic category. As a result, the diagnostic category 'PTSD' has been considerably expanded, with an eightfold increase in defining PTSD from DSM-IV (79,794 ways to define PTSD) to DSM-5 (636,120 ways) (Galatzer-Levy & Bryant, 2013). This appears to offer flexibility to the clinician: there is a multitude of symptoms to choose from. However, this flexibility has its limitations: there is no flexibility for the clinician to distinguish *within* a diagnosis between different symptom profiles that individual patients may exhibit. As we reasoned in ***Chapter 6***, a symptom-oriented approach will be more meaningful (Fried, 2022). Moreover, it will also be necessary to look beyond diagnosis or symptoms of PTSD. After all, there are many factors outside PTSD that are particularly related to recovery and better treatment results, such as comorbidity (e.g. anger, depression, sleep, pain, alcohol abuse) as well as social dysfunctions (poor quality of life), dysfunctional coping,

dysfunctional attachment styles, limited social support, persistent psychosocial stress, and childhood trauma and neglect (Keyan et al., 2024; Maercker et al., 2022; Teicher, 2022).

All findings from the current and previous studies should lead to more attention to these factors and, from there, specific development of more effective treatment strategies for these patients. Trauma-focused treatment is certainly applicable and effective in patients with PTSD and comorbidities, but taking into account the role of other influencing factors, outside of PTSD, may be helpful in patients who do not recover after trauma treatment. Moreover, too much focus on PTSD alone can cause the adjacent and often equally important mental health problems to be neglected. For the clinician, the DSM classification offers limited guidance in this respect. To be able to address all influencing factors regarding the course and recovery through treatment, a more advanced, more customized and personalized way of classification or diagnosing is needed.

From this perspective, it is not surprising that clinicians and researchers are looking for other diagnostic models that focus more on dimensional frameworks, as these offer them more flexibility (Rief et al., 2023). Examples as mentioned earlier in this dissertation are the 'Research Domain Criteria' (RDoC), the 'Hierarchical Taxonomy of Psychopathology' (HiTOP), and the 'Network Approach' (Box 7.1). All these diagnostic models have generated enthusiasm among clinicians and researchers, but they are not yet sufficiently established for use in practice. Sometimes they are too complex to use, or there is still too little awareness and familiarity, and above all, insufficient scientific research has yet been conducted (Aftab & Ryzner, 2020). The categorical DSM system has built up a huge lead in this regard.

Finally, does this mean that diagnostic *categories* should be abolished? The answer to this is not a simple one. In general, many mental conditions are dimensional, so categorical classification can lead to false clarity. This is also the case in somatic medicine, where many conditions are dimensional, such as blood sugar levels or blood pressure. But for the clinician clearcut categories can be important for easier recognition, the so-called diagnostic 'pattern recognition' of a condition. Categorization is also important for treatment-related actions. Clinicians want to know whether to act or not, and a well-defined diagnosis can provide clarity. Policymakers also want clear diagnostic classifications, for example to estimate who can and who cannot receive care. And researchers need clarity, so that they can, for example, compare patient groups in studies. Moreover, patients often need clarity. For example, it can ensure recognizability of what is going on, both for the individual and for his environment. The right to governmental or health insurance benefits and access to care are also often linked to specific diagnoses. However, categorical diagnostics can also have disadvantages. For instance, patients who have disabling symptoms but do not fall into a specific diagnostic category may not receive adequate professional help or financial benefits. Also, a psychiatric diagnosis may lead to social stigmatization (see ***Paragraph 1.2*** and Table 1.1).

In a next section (7.4) we will propose a diagnostic model that is less far-reaching than the dimensional frameworks outlined above, because it is based on categorical classification to which dimensional elements have been added.

The RDoC (Research Domain Criteria) is a research-oriented, flexible and functional diagnostic system that aims to bridge clinical applications and more basic psychological and neurobiological scientific areas. The RDoC is based on six broad domains of constructs: negative and positive valence, cognition, social processes, arousal and sensorimotor systems. Each of these domains is divided into several more fundamental (sub)constructs. For instance, the 'cognitive domain' includes such subconstructs as attention, cognitive control, and perception. All of these constructs range from normal to abnormal. The domains can be investigated on the basis of the (continuously growing) scientific knowledge of the range from genes, molecules, circuits, physiology, behavior to self-reporting. In this framework, RDoC aims to study the ways in which basic constructs or functions (e.g. cognitive control, reward processing) become dysregulated and result in symptoms and impairment (Cuthbert, 2022; Cuthbert et al., 2015).

HiTOP (Hierarchical Taxonomy of Psychopathology) represents a hierarchical model built from individual signs and symptoms at the lowest level, to respectively, maladaptive traits, symptom components, syndromes, subfactors and, at the higher levels, to spectra and a general factor of psychopathology or p- factor. In particular, the model is centered around the six core spectra that largely represent dimensions of psychopathology: somatoform, internalizing, thought, detachment, disinhibited externalizing, and antagonistic externalizing. From this, individual symptom profiles can be composed. According to HiTOP, the diagnosis is the patient's profile on psychopathology dimensions: spectra and subfactors describe the main difficulties the patient experiences, components and traits detail specific issues, whereas symptom components capture current problems and traits indicate their chronicity. Due to its flexibility and breadth, HiTOP can disentangle the processes, mechanisms, and causes of psychopathology (Kotov et al., 2017; 2022).

The Network Approach or Systems Perspective views mental disorders as complex systems, defined as symptoms and the relationship between these symptoms, which give rise to mental disorders. Symptoms are not reflective of an underlying latent construct but are related to each other and, in particular, cause each other. The development of mental disorders according to this approach can be seen in (four) phases. In an asymptomatic phase, the network is stable, inactive or dormant. An external event may activate some of the symptoms to manifest: the network is then activated. These activated symptoms can in turn activate connected symptoms, resulting in symptom spread. If this activated symptom network is strongly connected, removal of the external event does not lead to recovery: a mental disorder has developed in which the network is in an active, self-sustaining, and stable state. Treatment interventions follow from this (Borsboom, 2017; Fried, 2022).

Box 7.1. Three examples of alterative diagnostic models for mental problems.

7.4 A DIAGNOSTIC APPROACH FOR THE PSYCHOLOGICAL CONSEQUENCES OF TRAUMA

While some patients experience a reduction or resolution of their post-traumatic symptoms, others experience persistent symptoms for long periods of time, and still others experience worsening of symptoms and development of heterogeneity over time. Distinguishing between different symptom profiles in traumatized patients will lead to better recognition, a more personalized diagnosis and a more targeted and tailored treatment approach, and can above all serve to better prevent chronic symptom trajectories. Based on this reasoning, we will elaborate a more comprehensive model in the coming paragraphs, in which the heterogeneity of symptoms after psychotraumatic events is better reflected than current classification systems. This is represented by a combination of '*subtyping*' (Dalenberg et al., 2012) (also: Chapters 4 and 5) and '*staging*' (McFarlane et al., 2017; Nijdam et al., 2022).

7.4.1. SUBTYPING

Subtyping is a way of separately describing additional symptoms to an existing diagnostic category. These additional symptoms can indicate the degree of complexity and/or heterogeneity. Various symptom subtypes of PTSD have been described (see e.g., ***Chapters 4*** and ***5***). Some are more dimensional in nature, such as internalizing versus externalizing subtypes or subtyping in severity (ranging from mild symptoms to symptoms with high severity), and some more categorical, such as the dissociative subtype, the complex PTSD subtype, the delayed subtype, or mixed symptom subtypes with depression, anxiety, and grief (Table 7.2). The subtypes of course depend very much on which symptoms were measured. Studies with with Latent Class / Profile Analysis (LCA/ LPA) often provide a more independent outcome and usually show profiles that find differences in symptom severity but certainly also, albeit to a lesser extent, symptom profiles that represent different combinations of symptoms. In line with the findings from our two LPA studies (***Chapters 3*** and ***4***), subtypes defined by symptom severity are often reported in the literature and considered important in clinical practice (Broman-Fulks et al., 2006).

With subtypes, the variation in symptomatology per individual can be better represented, whereby more specific, personalized targets for treatment can be defined (Broman-Folks et al., 2006; Dalenberg et al., 2012). For example, a PTSD subtype with symptoms of prolonged grief and/ or depression may require more cognitive interventions in addition to TFT to improve sadness, loss, or depressed mood (Djelantik et al., 2020). And a patient with PTSD, internalizing subtype (with more anxiety, withdrawal, and avoidance) will need a different treatment approach than a patient with PTSD, externalizing subtype (tendency to aggression and acting-out, substance abuse) (Forbes et al., 2010). The subtyping method is supported by a recent meta-analysis, which found several characteristics associated with poorer treatment response, such as lower levels of activation of fear-related brain regions and lower levels of executive control (Keyan et al., 2024). These characteristics may be consistent with the internalizing-externalizing dimension.

New findings may lead to the definition of new, more treatment-oriented subtypes, allowing for more targeted identification of specific, essential symptom profiles and the development of more targeted treatment options.

Table 7.2. Proposed dimensions of symptom subtyping.

PTSD Subtypes described in the literature
Severity (ranging from low to highly severe)
Dissociative (vs Non-Dissociative)
Complex (vs Simple or Regular)
Depressive (vs Non-Depressive)
Mixed PTSD / depression
Mixed PTSD / Prolonged Grief
Internalization vs Externalization
Childhood Emotional Maltreatment (CM) vs Non-CM

7.4.2. STAGING

While subtyping can provide information about the heterogeneity of symptoms at a certain moment, the principle of 'staging' provides a longitudinal perspective. Staging is derived from somatic medicine, and has been developed for various mental disorders. Staging is an approach to improve early recognition, confirm diagnosis across prodromal, acute, residual, recurrent, and chronic disease phases, and predict treatment response and prognosis. The approach has an explicitly longitudinal perspective and also takes into account, among other things, family history, as well as early development and clinical antecedents in childhood. Staging for psychiatric disorders was first described by Fava and Kellner (1993) and has now been described for various mental disorders such as psychosis, anxiety, mood, and bipolar disorders (e.g., Kupka et al., 2021; McGorry et al., 2010), as well as for trauma related disorders (McFarlane et al., 2017; Nijdam et al., 2022).

In staging, the development of the disorder is based on a perspective in which symptoms can, for example, recover, but also progress, change or shift into complex symptom constellations that lead to further deterioration of the patient's condition. In addition to symptomatological change and especially worsening, this deterioration is often accompanied by a decrease in functional and psychosocial capabilities. Various mechanisms can play a role in this development like e.g., neurobiological mechanisms as kindling and sensitization, but also information processing systems, and stress reactivity. This is reflected in the staging model for PTSD and trauma-related problems, which describes various stages, from mild to severe psychological problems, and indicates the symptomatology and treatment approach for each stage (see Table 7.3).

Table 7.3. The model of staging (adapted in short from: Nijdam et al., 2022).

Stages	Description of stages	Symptoms/ impairment
0	Trauma exposed, asymptomatic but at risk	Increased vigilance
1a	Mild anxiety and distress	Heightened stress; sleeping problems
1b	Subsyndromal distress with some behavioral functional decline	Memories of PTEs; attention difficulties; startle response
2	First episode of full-threshold symptoms	PTSD symptoms; dissociative symptoms
3	Persistent symptoms: *3a*: incomplete remission; *3b*: recurrence or relapse; *3c*: multiple relapses or worsening	More severe PTSD symptoms; dysfunctional cognitions; social isolation; loss of connection to others and lack of basic trust
4	Severe unremitting illness of increasing chronicity	Permanent limitations in task performance; strong isolation; extreme avoidance; cognitive decay; loss of reflective capacity; persistent affect dysregulation; survival mode

Next to these descriptions, specific therapeutic interventions are described, aimed at the problems defined at a specific stage. These interventions range from single interventions such as Prolonged Exposure (PE), Cognitive Behavioral Therapy (CBT), or Eye Movement Desensitization and Reprocessing (EMDR) (stage 2), through interventions that address multiple aspects of traumatization, such as Narrative Exposure Therapy (NET), Brief Eclectic Psychotherapy for PTSD (BEPP), or pharmacotherapy (stage 3a), approaches more focused on personality problems such as schema therapy (stage 3b), to more extensive interventions such as social support, physical assistance, and psychosocial interventions to prevent further deterioration of functioning (stage 4).

For stages 3 to 4, for example, various such integrated and more extensive multidisciplinary and modular treatment programs are offered within ARQ Centrum'45 for the benefit of their traumatized patients who often exhibit long-term and multiple comorbid complaints in addition to PTSD. Trauma-focused therapies are applied within these treatment programs, such as NET for traumatized refugees with PTSD (de la Rie et al., 2020), BEPP for patients with multiple traumatic losses and traumatic grief (de Heus et al., 2017), and various TFT treatments including EMDR for traumatized police officers with PTSD (Martinmäki et al., 2023).

7.4.3. GOING BACK TO THE CASE STUDIES

All in all, we argue for a more comprehensive diagnostic model for PTSD with subtyping and staging, which allows for more personalized treatment approaches. This model allows the clinician to focus on the most noticeable and, importantly, most disabling symptoms. Although the staging model alone provides a longitudinal perspective, it does not sufficiently reflect the different symptom profiles that traumatized patients may exhibit. Careful subtyping is indispensable for this. It is precisely through subtyping that the specific symptomatology can be defined at a specific time and stage (see 7.4.1). This is consistent with the findings of this dissertation, in which heterogeneity of posttraumatic symptomatology is the common thread.

Referring to the case studies described in ***paragraph 1.1***, we saw that *Bram*, *Amir*, and *Mary* are all traumatized and all three likely meet the criteria for PTSD and will be diagnosed as such. However, as described in the vignettes, there are important differences between them, in terms of the nature of the traumatization, its duration, their completely different symptom profiles, their level of functioning, and the longitudinal aspect of the complaints.

Bram, a firefighter, experienced a horrible, traumatic event. According to a dimensional way of looking at his PTEs (Table 7.1), he experienced (quantitatively) a single PTE, with short duration and with a proximity that was close. The last dimension (proximity) will be impactful. Next, regarding the qualitative aspects of PTEs, he as a firefighter experienced some control over the situation. This aspect, together with his age (young adult) and most other qualitative aspects would probably mean that the negative impact on his mental problems would be limited. The perceived powerlessness he has experienced is, however, an important risk factor. The weighing of the quantitative aspects and the qualitative aspects of the PTE that Bram has experienced shows that the consequences for him could be limited. This is also evident

from his pattern of complaints, which, when we look at subtyping (Table 7.2), mainly consists of 'simple' PTSD symptoms: re-experiencing such as nightmares, avoidance symptoms and increased irritability. Based on this line of thought, he can be classified in stage 2: 'first episode of full-threshold symptoms' (Table 7.3). The preferred treatment for Bram will then consist of trauma-oriented therapy for PTSD, such as PE or EMDR. However, considering his work as a firefighter, he will likely experience more PTEs in the future. This does involve a longitudinal perspective that could make him vulnerable and this will have to be discussed with him.

Amir, a Syrian refugee, had experienced a great number of PTEs as well as PTE types: experiences with bombings, prolonged torture, the loss of his wife and son, a long journey to flee from his country, and a threatening robbery in the Netherlands. The duration of traumatization and the proximity (especially with the torture) are associated with higher negative impact. Many of the qualitative dimensions of the PTEs that Amir experienced also should have a negative impact, such as the dimensions related to 'lack of control', 'perceived powerlessness', 'suddenness', 'life threat', and 'interpersonal trauma' (Table 7.1). Next to this, he experienced the loss of his beloved ones. Taking this into account, it can be deduced that the consequences for him will be serious, which is true: in addition to symptoms of re-experiencing, he has various physical, mainly neurological complaints, but also depressive complaints and grief complaints. Regarding subtyping, his complaints go far beyond PTSD: we can define dimensions with depressive symptoms and prolonged grief, perhaps an internalizing dimension and a serious severity dimension (Table 7.2). Nowadays, physical symptoms no longer have a place within trauma diagnoses in classification systems such as the DSM-5, while in the past they often had a prominent place, as we noted in Chapter 2. This requires us to describe the physical symptoms as a co-morbid disorder listed in the Somatic Symptom Disorders chapter of the DSM-5 (APA, 2013).

Considering that he functioned well before the traumatization and during a long period in the Netherlands, and only rather recently developed serious and heterogeneous symptoms, we will end up in stage 3b (recurrence or relapse and persistent impairments) (Table 7.3). Reasoned from here, Amir could possibly be helped with a more comprehensive (and culturally sensitive) treatment approach: NET for his multiple, long-term traumatization, followed by treatment for his depression and grief, psychosocial interventions for his withdrawal, and, for example, some form of physical therapy for his neurological symptoms.

Finally, *Mary* had been exposed to many and very different PTEs, and she experienced them for a very long time. In fact, throughout her life, from early childhood, she experienced PTE dimensions such as 'lack of control', 'powerlessness', 'life threat', interpersonal PTEs', and 'PTEs in a period of developmental vulnerability'. She fell into abusive relationships and showed a wide range of psychopathology that is referred to as a 'complex' subtype of PTSD (Table 7.2), i.e., including many interpersonal problems, emotion regulation problems, self-mutilation, and dissociation. Due to her experiences, she has hardly ever been able to function well socially and she therefore falls into stage 4, severe unremitting illness or increasing chronicity (Table 7.3). Also here, trauma-focused treatment will be indicated, to treat her

post-traumatic symptoms. However, additional interventions will be needed and Mary should probably be helped with a comprehensive treatment approach. Perhaps dialectical behavioral therapy or schema focused therapy for her interpersonal and emotion regulation problems could be helpful for her recovery. In addition, intensive psychosocial support will be needed to build a more functional life.

7.5 STRENGTHS AND LIMITATIONS

A strength of the current studies was that they all included fairly large samples of patients. Moreover, the samples consisted of naturalistic, clinical samples of patients: one sample (***Chapter 3***) consisted of treatment-seeking patients who had barely been in treatment, while in three other studies (***Chapters 4***, ***5***, and ***6***) the patients had been in treatment for an extended period. Many of these patients would be recognized by clinicians in mental health care. The thorough statistical analysis methods applied in various studies, such as LPA and LMM, and the fact that we considered a wide range of psychopathology types in the studies were also strengths.

Nevertheless, the results arising from this dissertation should be interpreted with a number of limitations in mind. The various chapters described the most important limitations of the studies themselves. This section will identify some important overarching limitations. First, although interesting clinical patient groups such as traumatized veterans, police officers, and refugees were investigated, generalizability to other traumatized patient groups and especially to non-clinical traumatized groups is uncertain. In particular, most of our study samples (except the sample used in ***Chapter 3***) included patients referred to a highly specialized trauma center who reported high levels of stress and long-term complaints. Second, research was conducted using a set of data collected for treatment purposes. This meant a limitation in the use of diagnostic questionnaires used in the institution, limiting research opportunities. Third, the data in most of our studies are from a single institution (i.e., ARQ National Psychotrauma Centre; except the study described in ***Chapter 3***), so generalizability to other clinical sample groups must be done with caution. Fourth, the data came largely from self-report questionnaires, which can introduce a response bias compared with clinician based clinical interviews. Fifth, in several studies we used diagnostic criteria according to the DSM-IV (except for the study in Chapter 6). Because symptom criteria have changed from DSM-IV to DSM-5, comparing our studies with studies using DSM-5 criteria should be done with caution.

7.6 RECOMMENDATIONS FOR FURTHER RESEARCH

Several recommendations for future research can be made based on our findings. First, in a broader sense, it can be advised to conduct research on a greater diversity of patient groups.

Especially patient groups with various types of traumatic experiences in their history, but also in non-clinical samples. The research should ideally be longitudinal in nature. Following traumatized individuals over years would provide more insight into the course of post-traumatic psychopathology, but also into the characteristics of resilience in individuals who do not develop symptoms or dysfunctions. In this context, protective and undermining factors of individuals will have to be identified.

Second, based on this thesis, it would be desirable to better identify which aspects of potentially traumatic experiences (and other negative experiences) are relevant to the course of post-traumatic complaints/symptoms and also to what extent they are relevant to the outcome of the treatment. This allows the definition of a better, more nuanced model of external factors influencing psychopathology, and as advocated in this thesis, not just the strict trauma definition in the DSM-5.

Third, most current research is conducted with and relies on current diagnostic classification systems. Based on the findings from this dissertation, we would like to make a plea for less disorder-oriented, more symptom-oriented research. This would require a 'bottom-up' inventory of a wide range of symptoms in study samples, without directly categorizing them into well-defined categories. From here, these symptoms can be assessed for relevance, for example regarding their influence on the course of mental health problems or on (dys)functioning. This can be done with research through LPA, but a promising and inspiring method to further develop this research direction is the 'network approach' as described in this dissertation. From this symptom-oriented approach, symptom profiles can be defined for groups of patients (subtypes) and associations of these profiles with the course of psychopathology and treatment outcome can be tested.

Fourth, we argue that, in characterizing mental health problems following traumatic events, not only symptoms are important. In this dissertation we also point out the importance of paying attention to identifying and testing aspects of general (dys)functioning, such as limitations in relational, social, and occupational functioning. This allows the relationship between, for example, the level of functioning and specific psychosocial factors (e.g., social disadvantage or poverty) and the nature, severity and course of the symptomatology to be clarified. This knowledge makes it possible to better assess in clinical practice and research which factors are important for the course of psychopathology and for treatment outcome. Moreover, this knowledge can lead to the development and implementation of more effective treatment strategies.

In sum, future research may contribute to the definition of more specific and detailed dimensions of PTEs and other stressors, context-related and personality-related dysfunctions, specific symptom profiles, and levels of functioning. This will enable identification of individuals at risk and patients with all kinds of complaints and the development of more targeted and tailored interventions. Yet, this does not mean that interventions are only about treatment interventions. Ideally, preventive actions are often the most effective interventions we can think of. These can primarily involve prevention of the occurrence of potentially traumatic

experiences, for example by providing targeted education and guidance within families at risk for domestic violence or neglect. This form of primary prevention is not always possible in, for example, high-risk professions such as soldiers and police officers. In these cases, a negative course of complaints can be prevented by identifying risk factors and taking timely action with interventions such as psychosocial support, counseling, or victim support.

7.7 CONCLUSION

From the findings and discussion in this dissertation, we would like to emphasize that the categorically defined PTSD concept should be viewed from a broader, less rigid, and more dimensional perspective with a clear longitudinal, developmental component.

First, we propose not only to define PTEs in a categorical manner, but also to include dimensional characteristics, namely specific quantitative and qualitative features of trauma. Furthermore, we argue that it is important that the role of Criterion A is assessed with some relativity. After all, there are many more influencing factors on the development of trauma related psychopathology, such as context related factors (e.g., social support, stress due to psychosocial problems, and long-lasting mental health problems), factors related to personality (e.g., coping, attachment styles, and neuroticism), and cultural or social paradigms. Although a lot of research has already been done on this, there are still insufficient guidelines in clinical practice as to which should, and which should not, be included in diagnosis and treatment.

Second, the supposed post-traumatic psychopathology is more diverse than is assumed in the current diagnostics. PTSD presents itself in ever-changing guises. Moreover, various research shows that a large part of the diagnostic categories in the DSM are in one way or another related to psychotrauma and many exhibit re-experiencing symptoms. In fact, it follows from our studies that there is a lot of symptom heterogeneity, and it is not easy to define unambiguous diagnostic categories as a result of serious shocking events.

It is recommended not to view PTSD as an all-encompassing diagnostic category for the complaints of patients who have experienced traumatic experiences: the consequences of traumatic experiences should be viewed in a broader perspective. This perspective can be achieved by using a diagnostic model of subtyping and staging, where dimensional aspects are added to diagnostic categories. This better reflects the *multiple and changing faces* of posttraumatic psychopathology, that is, the heterogeneity of posttraumatic symptomatology and the description of the course of psychopathology in an individual over time, respectively. Moreover, it can provide opportunities for more targeted treatment approaches.

REFERENCES

Aftab, A., & Ryznar, E. (2021). Conceptual and historical evolution of psychiatric nosology. *International Review of Psychiatry*, *33*(5), 486-499. doi:10.1080/09540261.2020.1828306

Alarcon, R.D., Glover, S.G., & Deering, C.G. (1999). The cascade model: An alternative to comorbidity in the pathogenesis of posttraumatic stress disorder. *Psychiatry, 62*, 114-124. doi:10.1080/00332747.1999.11024860

Allsopp, K., Read, J., Corcoran, R., & Kinderman, P. (2019). Heterogeneity in psychiatric diagnostic classification. *Psychiatry Research*, *279*, 15-22.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.*).* Arlington, VA: Author.

Andreasen NC. (1995). Posttraumatic stress disorder: psychology, biology and the manichaean warfare between false dichotomies. *American Journal of Psychiatry, 152*, 963-965. doi:10.1176/ajp.152.7.963

Armenta, R. F., Walter, K. H., Geronimo-Hara, T. R., Porter, B., Stander, V. A., & LeardMann, C. A. (2019). Longitudinal trajectories of comorbid PTSD and depression symptoms among US service members and veterans. *BMC Psychiatry*, *19*, 1-12. doi:10.1186/s12888-019-2375-1

Borsboom, D. (2017). A network theory of mental disorders. *World Psychiatry, 16(1),* 5-13. doi:10.1002/wps.20375

Boudoukha, A. H., Ouagazzal, O., & Goutaudier, N. (2017). When traumatic event exposure characteristics matter: Impact of traumatic event exposure characteristics on posttraumatic and dissociative symptoms. *Psychological Trauma: Theory, Research, Practice, and Policy*, *9*(5), 561. doi:10.1037/tra0000243

Boullier, M., & Blair, M. (2018). Adverse childhood experiences. *Paediatrics and Child Health, 28*(3), 132-137. doi:10.1016/j.paed.2017.12.008

Bracken, P. J. (2001). Post-modernity and post-traumatic stress disorder. *Social Science and Medicine*, *53*(6), 733-743. doi:10.1016/S0277-9536(00)00385-3

Broman-Fulks, J.J., Ruggiero, K.J., Green, B.A., Kilpatrick, D.G., Danielson, C.K., Resnick, H.S., & Saunders, B.E. (2006). Taxometric investigation of PTSD: Data from two nationally representative samples. *Behavior Therapy*, *37*(4), 364-380. doi:10.1016/j.beth.2006.02.006

Contractor, A. A., Roley-Roberts, M. E., Lagdon, S., & Armour, C. (2017). Heterogeneity in patterns of DSM-5 posttraumatic stress disorder and depression symptoms: Latent profile analyses. *Journal of Affective Disorders*, *212*, 17-24. doi:10.1016/j.jad.2017.01.029

Cuthbert, B.N. (2015). Research Domain Criteria: toward future psychiatric nosologies. *Dialogues in Clinical Neuroscience*, *17*(1), 89. doi:10.31887/DCNS.2015.17.1

Cuthbert, B. N. (2022). Research domain criteria (RDoC): progress and potential. *Current Directions in Psychological Science*, *31*(2), 107-114. doi:10.1177/09637214211051363

Dalenberg, C.J., Glaser, D., & Alhassoon, O.M. (2012). Statistical support for subtypes in posttraumatic stress disorder: The how and why of subtype analysis. *Depression and Anxiety, 29*, 671-678. doi:10.1002/da.21926

de Heus, A., Hengst, S. M., de la Rie, S. M., Djelantik, A. M. J., Boelen, P. A., & Smid, G. E. (2017). Day patient treatment for traumatic grief: Preliminary evaluation of a one-year treatment programme for patients with multiple and traumatic losses. *European Journal of Psychotraumatology, 8(1)*, 1375335. doi:10.1080/20008198.2017.1375335

De la Rie, S. M., Smid, G. E., van der Aa, N., van Est, L. A., Bisseling, E., & Boelen, P. A. (2020). Feasibility of narrative exposure therapy in an outpatient day treatment programme for refugees: improvement in symptoms and global functioning. *European Journal of Psychotraumatology, 11(1),* 1759983. doi:10.1080/20008198.2020.1759983

Djelantik, A. M. J., Robinaugh, D. J., Kleber, R. J., Smid, G. E., & Boelen, P. A. (2020). Symptomatology following loss and trauma: Latent class and network analyses of prolonged grief disorder, posttraumatic stress disorder, and depression in a treatment-seeking trauma-exposed sample. *Depression and Anxiety*, *37*(1), 26-34. doi:10.1016/j.psychres.2022.114472

Fava, G. A., & Kellner, R. (1993). Staging: a neglected dimension in psychiatric classification. *Acta Psychiatrica Scandinavica*, *87*(4), 225-230. doi:10.1111/j.1600-0447.1993.tb03362.x

Flory, J. D., & Yehuda, R. (2015). Comorbidity between post-traumatic stress disorder and major depressive disorder: alternative explanations and treatment considerations. *Dialogues in Clinical Neuroscience*, *17*(2), 141-150. doi:10.31887/DCNS.2015.17.2/jflory

Forbes, D., Elhai, J. D., Miller, M. W., & Creamer, M. (2010). Internalizing and externalizing classes in posttraumatic stress disorder: A latent class analysis. *Journal of Traumatic Stress*, *23*(3), 340-349. doi:10.1002/jts.20526

Forbes, M. K., Neo, B., Nezami, O. M., Fried, E. I., Faure, K., Michelsen, B., Twose, M., & Dras, M. (2023). Elemental psychopathology: Distilling constituent symptoms

and patterns of repetition in the diagnostic criteria of the DSM-5. *Psychological Medicine*, *54*(5), 886-894. doi:10.1017/S0033291723002544

Fried, E. I. (2022). Studying mental health problems as systems, not syndromes. *Current Directions in Psychological Science, 31*(6), 500–508. doi:10.1177/09637214221114089

Galatzer-Levy, I.R., & Bryant, R.A. (2013). 636,120 ways to have posttraumatic stress disorder. *Perspectives on Psychological Science*, *8*(6), 651-662. doi :10.1177/1745691613504115

Grinker. R. R., & Spiegel, J. P. (1945). *War Neuroses*. Blakiston.

Harald, B., & Gordon, P. (2012). Meta-review of depressive subtyping models. *Journal of Affective Disorders*, *139*(2), 126-140. doi:10.1016/j.jad.2011.07.015

Hoge, C.W., Yehuda, R., Castro, C.A., McFarlane, A.C., Vermetten, E., Jetly, R., Karestan C., Koenen, K.C., Greenberg, N, Shalev, A.Y., Rauch, S.A.M., Marmar, C.R., & Rothbaum, B.O. (2016). Unintended consequences of changing the definition of posttraumatic stress disorder in DSM-5: critique and call for action. *JAMA Psychiatry*, *73*(7), 750-752. doi:10.1001/jamapsychiatry.2016.0647

Horwitz, A. V. (2018). *PTSD: A short history*. Baltimore: John Hopkins University Press.

Hou, W. K., Liu, H., Liang, L., Ho, J., Kim, H., Seong, E., Bonanno, G. A., Hobfoll, S. E., & Hall, B. J. (2020). Everyday life experiences and mental health among conflict-affected forced migrants: A meta-analysis. *Journal of Affective Disorders*, *264*, 50-68. doi:10.1016/j.jad.2019.11.165

Hyman, S. E. (2010). The diagnosis of mental disorders: The problem of reification. *Annual Review of Clinical Psychology*, *6*(1), 155–179. doi:10.1146/annurev.clinpsy.3.022806.091532

Jones, E., & Wessely, S. (2007). A paradigm shift in the conceptualization of psychological trauma in the 20th century. *Journal of Anxiety Disorders*, *21*(2), 164-175. doi:10.1016/j.janxdis.2006.09.009

Karstoft, K. I., & Armour, C. (2023). What we talk about when we talk about trauma: Content overlap and heterogeneity in the assessment of trauma exposure. *Journal of Traumatic Stress*, *36*(1), 71-82. doi:10.1002/jts.22880

Kendler, K. S. (2016). The nature of psychiatric disorders. *World Psychiatry*, *15*(1), 5-12. doi:10.1002/wps.20292

Keyan, D., Garland, N., Choi-Christou, J., Tran, J., O'Donnell, M., & Bryant, R. A. (2024). A systematic review and meta-analysis of predictors of response to trauma-focused psychotherapy for posttraumatic stress disorder. *Psychological Bulletin.* Advance online publication. doi:10.1037/bul0000438

Kleber, R. J. (2013). Epilogue: Towards a broader perspective of traumatic stress. In: R. J. Kleber, Ch. R. Figley & B. P. R. Gersons (Eds.), *Beyond trauma: Cultural and societal dimensions* (pp. 299-306). Springer Science & Business Media (reprint from 1995, Plenum, New York).

Kotov, R., Krueger, R.F., Watson, D., Achenbach, T.M., Althoff, R.R., Bagby, R.M., ... & Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology, 126*(4), 454–477. doi:10.1037/abn0000258

Kotov, R., Cicero, D. C., Conway, C. C., DeYoung, C. G., Dombrovski, A., Eaton, N. R., ... & Wright, A. G. (2022). The Hierarchical Taxonomy of Psychopathology (HiTOP) in psychiatric practice and research. *Psychological Medicine 52*, 1666–1678. doi:10.1017/S0033291722001301

Kupka, R., Duffy, A., Scott, J., Almeida, J., Balanzá-Martínez, V., Birmaher, B., ... & Kapczinski, F. (2021). Consensus on nomenclature for clinical staging models in bipolar disorder: A narrative review from the International Society for Bipolar Disorders (ISBD) Staging Task Force. *Bipolar Disorders*, *23*(7), 659-678. doi:10.1111/bdi.13105

Larsen, S. E., Fleming, C. J., & Resick, P. A. (2019). Residual symptoms following empirically supported treatment for PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy*, *11*(2), 207. doi:10.1037/tra0000384

Lerner, P. (2001). From traumatic neurosis to male hysteria: The decline and fall of Hermann Oppenheim, 1889–1919. In M. S. Micale & P. Lerner (Ed.), *Traumatic pasts. History, Psychiatry, and Trauma in the Modern Age, 1870-1930*. (p. 143). Cambridge University Press.

Lerner, P. & Micale, M. S. (2001). Trauma, Psychiatry, and History: A Conceptual and Historiographical Introduction. In M. S. Micale & P. Lerner (Ed.), *Traumatic Pasts. History, Psychiatry, and Trauma in the Modern Age, 1870-1930* (pp. 1-27). Cambridge University Press.

Litz, B. T., & Kerig, P. K. (2019). Introduction to the special issue on moral injury: Conceptual challenges, methodological issues, and clinical applications. *Journal of Traumatic Stress*, *32*(3), 341-349. doi:10.1002/jts.22405

Maercker, A., Bernays, F., Rohner, S. L., & Thoma, M. V. (2022). A cascade model of complex posttraumatic stress disorder centered on childhood trauma and maltreatment, attachment, and socio-interpersonal factors. *Journal of Traumatic Stress*, *35*(2), 446-460. doi:10.1002/jts.22756

Martinmäki, S. E., van der Aa, N., Nijdam, M. J., Pommée, M., & Ter Heide, F. (2023). Treatment response and treatment response predictors of a multidisciplinary day clinic for police officers with

PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy*, *15*(2), 349. doi:10.1037/tra0001128

McFarlane, A.C., Lawrence-Wood, E., Van Hooff, M., Malhi, G.S., & Yehuda, R. (2017). The need to take a staging approach to the biological mechanisms of PTSD and its treatment. *Current Psychiatry Reports*, *19*(2), 10. doi:10.1007/s11920-017-0761-2

McGorry, P. D., Nelson, B., Goldstone, S., & Yung, A. R. (2010). Clinical staging: a heuristic and practical strategy for new research and better health and social outcomes for psychotic and related mood disorders. *The Canadian Journal of Psychiatry*, *55*(8), 486-497. doi:10.1177/070674371005500803

McHugh, P. R., & Treisman, G. (2007). PTSD: A problematic diagnostic category. *Journal of Anxiety Disorders*, *21*(2), 211-222. doi:10.1016/j.janxdis.2006.09.003

McNally, R. J. (2004). Conceptual problems with the DSM-IV criteria for posttraumatic stress disorder. *Posttraumatic stress disorder: Issues and controversies*, 1-14.

Miller, K. E., & Rasmussen, A. (2017). The mental health of civilians displaced by armed conflict: an ecological model of refugee distress. *Epidemiology and Psychiatric Sciences*, *26*(2), 129-138. doi:10.1017/S2045796016000172

Neuner, F. (2023). Physical and social trauma: towards an integrative transdiagnostic perspective on psychological trauma that involves threats to status and belonging. *Clinical Psychology Review*, *99*. doi:10.1016/j.cpr.2022.102219

Nijdam, M. J., Vermetten, E., & McFarlane, A. C. (2023). Toward staging differentiation for posttraumatic stress disorder treatment. *Acta Psychiatrica Scandinavica*, *147*(1), 65-80. doi:10.1111/acps.13520

Parson, E.R. (1990), Post-traumatic Demoralization syndrome (PTDS). *Journal of Contemporary Psychotherapy 20*, 17-33. doi:10.1007/BF00946017

O'Donnell, M. L., Creamer, M., & Pattison, P. (2004). Posttraumatic stress disorder and depression following trauma: understanding comorbidity. *American Journal of Psychiatry*, *161*(8), 1390-1396. doi:10.1176/appi.ajp.161.8.1390

Olbert, C. M., Gala, G. J., & Tupler, L. A. (2014). Quantifying heterogeneity attributable to polythetic diagnostic criteria: theoretical framework and empirical application. *Journal of Abnormal Psychology*, *123*(2), 452. doi:10.1037/a0036068

Rief, W., Hofmann, S. G., Berg, M., Forbes, M. K., Pizzagalli, D. A., Zimmermann, J., Fried, E., & Reed, G. M. (2023). Do We Need a Novel Framework for Classifying Psychopathology? A Discussion Paper. *Clinical Psychology in Europe*, *5*(4). doi:10.32872/cpe.11699

Rosen, G. M. (2004). *Posttraumatic stress disorder: Issues and controversies* (pp. 39-61). Hoboken: John Wiley & Sons Ltd.

Schmidt, U. (2015). A plea for symptom-based research in psychiatry. *European Journal of Psychotraumatology*, *6*(1), 27660. doi:10.3402/ejpt.v6.27660

Sharkansky, E. J., King, D. W., King, L. A., Wolfe, J., Erickson, D. J., & Stokes, L. R. (2000). Coping with Gulf War combat stress: mediating and moderating effects. *Journal of Abnormal Psychology*, *109*(2), 188-197. doi:10.1037/0021-843X.109.2.188

Shepard, B. (2004). Risk factors and PTSD: a historian perspective. In: G.M. Rosen (ed), *Posttraumatic stress disorder: Issues and controversies* (pp. 39-61). Hoboken: John Wiley & Sons Ltd.

Shorter, E. (1993). *From paralysis to fatigue. A history of psychosomatic illness in the modern era*. New York: The Free Press.

Summerfield, D. (2001). The invention of post-traumatic stress disorder and the social usefulness of a psychiatric category. *BMJ: British Medical Journal*, *322*(7278), 95-98. doi:10.1136/bmj.322.7278.95

Teicher, M.H., Gordon, J.B. & Nemeroff, C.B. (2022). Recognizing the importance of childhood maltreatment as a critical factor in psychiatric diagnoses, treatment, research, prevention, and education. *Molecular Psychiatry, 27*, 1331–1338. doi:10.1038/s41380-021-01367-9

Titchener, J.L. (1986), Post-traumatic decline: a consequence of unresolved destructive drives. In: C.R. Figley (red.), *Trauma and its wake.* Volume II, 5-19. Brunner/Mazel, New York.

Young, A. (1995). *The harmony of illusions. Inventing posttraumatic stress disorder*. Princeton, NJ: Princeton University Press.

Zachar, P., & Kendler, K. S. (2017). The philosophy of nosology. *Annual Review of Clinical Psychology*, *13*, 49-71. doi:10.1146/annurev-clinpsy-032816-045020

Zimmermann, J., Kerber, A., Rek, K., Hopwood, C. J., & Krueger, R. F. (2019). A brief but comprehensive review of research on the alternative DSM-5 model for personality disorders. *Current Psychiatry Reports, 21*(9), 92. doi:10.1007/s11920-019-1079-z

Terugblik

de vervlogen oorlogsjaren
die in dromen weer ontwaken
onbewust vergeten waren
zullen nieuw tot leven raken

(….)

beelden uit een oud verleden
al het voorbije keert eens weer
traag onzeker gaan de schreden
terug naar tijden van weleer [14]

14 Retrieved from p. 74: Jongedijk, J.C. (2002). *Aflopend Getij*. Bergen: Uitgeverij Bonneville.

Addendum

Nederlandse samenvatting (summary in Dutch)
Dankwoord (acknowledgements in Dutch)
About the author
Publication list

&

NEDERLANDSE SAMENVATTING *Summary in Dutch*

DE VEELVOUDIGE EN VERANDERENDE GEZICHTEN VAN PSYCHOTRAUMA EN DE PSYCHOLOGISCHE GEVOLGEN

Ondanks dat de begrippen 'psychotrauma'[15] en 'posttraumatische stressstoornis' of 'PTSS' officieel pas 'bestaan' sinds 1980, zijn ze de afgelopen decennia zeer populair geworden in de wetenschappelijke literatuur en in behandelkamers, maar ook in de media en zelfs in het dagelijks taalgebruik. Toch is de populariteit van vooral het diagnostische concept PTSS ook bekritiseerd. Deze kritiek is zeer divers, is op diverse plekken in dit proefschrift beschreven en loopt onder andere uiteen van discussies over welke symptomen wel of niet tot PTSS zouden moeten behoren tot zelfs de mening dat PTSS een kunstmatig en arbitrair gecreëerd construct is zonder duidelijk bestaansrecht. De algemenere kritiek betreft de onduidelijkheid over de vele verschillende uitingsvormen van psychotrauma en PTSS, oftewel de heterogeniteit in symptoomexpressie, waarbij de invloed van de sociaal-culturele dimensie op het concept PTSS veel wordt beklemtoond vanuit sociologische, antropologische en historische perspectieven. Dit proefschrift draagt bij aan de kennis over de uitingsvormen van (potentieel) psychotraumatische gebeurtenissen en vooral over hun psychologische gevolgen.

Doelstellingen van de studies

Het doel van de studies die in dit proefschrift worden gepresenteerd is om antwoorden te geven op een aantal conceptuele vragen met betrekking tot psychotrauma en de psychologische gevolgen ervan. Voornamelijk gaat het om de vragen hoe PTSS als diagnostisch concept is geconstrueerd, hoe het is ontstaan, waarop het is gebaseerd, hoe het zich manifesteert en hoe het zich verhoudt tot andere psychische stoornissen. Omdat potentieel traumatische ervaringen (PTE's) onderdeel zijn van de definitie van PTSS, zijn in dit proefschrift ook aspecten van PTE's onderzocht.

De volgende onderzoeksvragen hebben geleid tot de onderzoeken die in dit proefschrift worden beschreven:

1. Wat zijn de historische wortels van PTSS, hoe is de definitie van posttraumatische symptomen en syndromen (zoals wetenschappers ze hebben gedefinieerd) tot stand gekomen, hoe zijn de symptomen en syndromen in de loop van de tijd geëvolueerd en veranderd, en onder welke omstandigheden en invloeden werden ze gevormd?
2. Hoe specifiek is de potentieel traumatische gebeurtenis (PTE) (voor de DSM: het A-criterium of het traumatische stressorcriterium) gedefinieerd en hoe specifiek is dit criterium gerelateerd aan PTSS en andere psychische stoornissen?
3. Zijn er binnen grotere groepen getraumatiseerde patiënten bepaalde subgroepen met verschillende, te onderscheiden symptoomprofielen? En zo ja, welke kenmerken hebben

15 Onder 'psychotrauma wordt in dit proefschrift de 'potentieel (psycho)traumatische gebeurtenis' of 'potentially traumatic event' verstaan, hier afgekort met 'PTE'.

deze subgroepen?

4. Welke componenten van PTSS, d.w.z. welke afzonderlijke symptoomclusters van PTSS volgens de DSM-5, zijn geassocieerd met het behandelresultaat?

Om deze vragen te beantwoorden hebben we een literatuuronderzoek naar de historie van psychotrauma en de psychologische gevolgen ervan uitgevoerd (hoofdstuk 2), verschillende definities van PTE's en de relatie ervan met psychopathologie onderzocht (hoofdstuk 3) en twee studies uitgevoerd naar symptoomprofielen binnen twee groepen getraumatiseerde patiënten (hoofdstuk 4 en 5). Vervolgens werd de associatie onderzocht van de verschillende PTSS-criteria, zoals gedefinieerd volgens DSM-5, met het behandelresultaat (hoofdstuk 6) en tenslotte werd een reflectie op de resultaten van de studies beschreven (hoofdstuk 7).

Inleiding

Het proefschrift begint met een korte schets van de problemen waarmee clinici in de dagelijkse praktijk te maken kunnen krijgen als het gaat om de heterogeniteit van de symptomatologie na PTE's **(*hoofdstuk 1*)**. We beschreven een drietal cases om te illustreren dat patiënten zich vaak presenteren met een grote verscheidenheid aan psychische symptomen, waarvan een deel niet onder het huidige PTSS-concept valt. Daarnaast werden de veranderingen in definities van PTSS door de jaren heen kort besproken en de onduidelijke relatie tussen PTE's en PTSS. Het hoofdstuk eindigde met de doelstellingen, relevantie en onderzoeksvragen van dit proefschrift.

Historisch literatuuroverzicht

Niet alleen vandaag de dag bestaat er onenigheid over de gevolgen van traumatische ervaringen, zoals bijvoorbeeld blijkt uit de verschillen tussen de definities van posttraumatische stressstoornis (PTSS) in de Diagnostic and Statistical Manual of Mental Disorders (DSM) en de International Classification of Diseases (ICD), maar onderzoekers en clinici hebben in het verleden ook met dergelijke meningsverschillen geworsteld. Dit was de aanleiding om een historisch overzicht van de literatuur over psychotrauma te beschrijven, om hiermee onze eerste onderzoeksvraag te kunnen beantwoorden ***(hoofdstuk 2)***.

In de wetenschappelijke literatuur over psychotrauma in de afgelopen anderhalve eeuw hebben we vier belangrijke trends kunnen vinden. Ten eerste ontdekten we dat er door de decennia heen een grote verscheidenheid aan symptomen werd beschreven na PTE's, wat leidde tot frequente wetenschappelijke debatten over hoe een posttraumatisch stress syndroom precies zou moeten worden gedefinieerd. Ten tweede vonden we een flinke hoeveelheid aan verschillende definities van posttraumatische syndromen (meer dan 70). Uit de literatuur hebben we hierbij wel een rode draad kunnen destilleren. Zo vonden we drie soorten syndromen: 1) een acuut en kortdurend syndroom, 2) een langduriger syndroom, en ten slotte 3) een complexer gedefinieerd syndroom met een breed scala aan symptomen. Hoewel we deze driedeling hadden aangetoond, werd het ook duidelijk dat de beschreven stoornissen die binnen een van de drie categorieën vielen zeker niet dezelfde waren. 'Shell

shock', 'soldiers heart', 'traumatische neurose', 'PTSS volgens de ICD' en 'PTSS volgens de DSM' vallen bijvoorbeeld in de tweede categorie stoornissen, maar zijn qua symptomatologie ieder heel anders gedefinieerd. Ten derde troffen we vaak hevige discussies aan over de oorsprong of oorzaak van posttraumatische syndromen. De meningsverschillen draaiden om de vraag of de oorzaak lichamelijk of psychologisch was, voortkwam uit simulatie of een zwakke wil, maar ook of de oorzaak wel de traumatische ervaring zelf was of grotendeels een reeds bestaande mentale of fysieke kwetsbaarheid. En ten vierde was er een herhaald patroon van tijdsgebonden, vaak sociale, maatschappelijke, juridische, wetenschappelijke en ook persoonlijke krachten die de kenmerken, achtergronden en definities van de posttraumatische concepten beïnvloedden.

In de discussie van hoofdstuk 2 wordt beargumenteerd waarom deze verscheidenheid aan symptomen en syndromen in de loop der jaren steeds aan verandering onderhevig is geweest. Dit fenomeen kan verklaard worden door posttraumatische symptomatologie te bestempelen als het resultaat van een interactie tussen tijdsgebonden sociale, politieke, juridische, wetenschappelijke en medische paradigma's die wetenschappers, clinici en ook patiënten zelf beïnvloeden. Deze paradigma's beïnvloeden de kijk op ziekte en lijden dusdanig dat er een voor die tijd herkenbare en aanvaardbare symptomatologie ontstaat. Ofwel, clinici en patiënten vormen ziekten naar de huidige paradigma's. Hierdoor zal er door de jaren (decennia) heen steeds weer een verschuiving ontstaan in de manifestaties van klachtenpatronen van getraumatiseerde patiënten. We concludeerden dat er daarom flexibiliteit in de traumadiagnostiek nodig is, omdat er waarschijnlijk geen universele, tijdloze, ondubbelzinnige en scherp gedefinieerde 'posttraumatische stressstoornis' bestaat, maar een steeds veranderende, zich altijd zich ontwikkelende stoornis.

Het trauma criterium

De tweede studie ***(hoofdstuk 3)*** werpt meer licht op onze tweede onderzoeksvraag, die te maken heeft met de potentieel psychotraumatische gebeurtenis (PTE), ofwel 'Criterium A' volgens de PTSS criteria van de DSM.

Er zijn in de wetenschappelijke literatuur de nodige discussies over PTE's beschreven. Deze discussies richten zich onder andere op wat wel en wat geen PTE zou zijn. De ernst van (traumatische) stressfactoren is immers continu van aard, variërend van bijvoorbeeld dagelijkse problemen die stress veroorzaken, eenmalige ongevallen of geweldsincidenten tot ernstige, langer durende en soms catastrofale gebeurtenissen zoals seksueel geweld, oorlog of marteling. Bovendien is gebleken dat het definiëren van een potentieel traumatische gebeurtenis niet makkelijk is: de definitie van Criterium A in de opeenvolgende DSM edities is steeds aan verandering onderhevig geweest. Een andere belangrijke discussie is de onduidelijke relatie van PTE's met PTSS. Slechts een klein deel van de personen die een PTE heeft meegemaakt, ontwikkelt een PTSS. Daarnaast zijn er individuen die PTSS-klachten ontwikkelen zonder dat aan de definitie van Criterium A wordt voldaan. En tot slot ontwikkelen mensen die een PTE hebben meegemaakt vaak geheel andere psychische stoornissen dan PTSS.

Ons onderzoek is uitgevoerd onder een heterogene groep van patiënten die zich hebben aangemeld voor behandeling bij een polikliniek voor algemene geestelijke gezondheidszorg. Om de relevantie en invloed van verschillende PTE definities op PTSS en overige psychopathologie te onderzoeken, hebben wij ten eerste drie PTE-definities geregistreerd, met toenemende mate van impact (aan de hand van de criteria van de DSM-IV, zie Tabel 1.2 van hoofdstuk 1) (APA, 1994). Deze definities hielden in: 1) alleen het criterium A1 (de gebeurtenis zelf), 2) criterium A1 plus A2 (de reactie van intense angst, hulpeloosheid of afgrijzen tijdens of onmiddellijk na de gebeurtenis) en 3) criterium A1, A2, plus criterium B (het optreden, na één maand, van herbelevingssymptomen). Daarnaast werden de diagnoses PTSS, depressieve stoornissen en angststoornissen vastgelegd.

Een van onze bevindingen was dat hoe hoger de impact van de PTE's was, hoe hoger de prevalentie van PTSS. Bovendien vonden we dat patiënten die een voorgeschiedenis met een hogere PTE-impact rapporteerden, een groter gebruik van geestelijke gezondheidszorg in het verleden meldden dan patiënten die PTE's rapporteerden met minder ernstige impact. Vervolgens volgde uit de studie, dat bijna de helft (47%) van de patiënten met een angststoornis en evenveel met een depressieve stoornis (zonder PTSS) PTE's gedurende hun leven rapporteerden. Bovendien rapporteerde 13% van de patiënten met een depressieve stoornis recente herbelevingssymptomen te hebben, vergeleken met 5,9% bij patiënten met angststoornissen.

Concluderend: de manier waarop PTE's worden gedefinieerd beïnvloedt de prevalentie van PTSS. Er is echter geen eenduidigheid over hoe deze definitie precies zal moeten worden geformuleerd. We hebben een alternatief, dimensionaal model voor PTE's voorgesteld, dat zowel een kwantitatieve indeling omvat (bijvoorbeeld aantal, variëteit, ernst, duur) als ook een kwalitatieve indeling (bijvoorbeeld onverwachtheid, gebrek aan controle, waargenomen levensbedreiging of interpersoonlijk geweld). Een tweede conclusie was, dat clinici zich ervan bewust moeten zijn dat PTE's maar ook herbelevingssymptomen niet alleen voorkomen bij patiënten met PTSS, maar ook kunnen voorkomen bij patiënten met andere psychische stoornissen, zoals depressieve stoornissen.

Heterogeniteit in symptoomprofielen

Niet alle patiënten met PTSS profiteren in gelijke mate van traumabehandeling en de meerderheid van hen behoudt na de behandeling aanzienlijke restsymptomen (Larsen et al., 2019). Het verduidelijken van de mate en aard van heterogeniteit in de symptomatologie kan bijdragen aan kennis op het gebied van herkenning en diagnose, maar ook op het gebied van de behandelaanpak bij getraumatiseerde patiënten. Het kan immers leiden tot gerichte aanpassingen van de behandeling waardoor de effectiviteit van de behandeling kan worden vergroten.

In twee onderzoeken hebben we een latente profielanalyse (LPA) uitgevoerd om te onderzoeken of subgroepen konden worden geïdentificeerd op basis van verschillende symptoomprofielen. LPA is een exploratieve statistische methode om te bepalen hoe

individuen zich groeperen op basis van gedeelde symptoomprofielen. Wat betreft uitkomst van LPA onderzoek, kunnen twee mogelijkheden worden onderscheiden: subgroepen die vooral verschillen in de *aard* van de symptomen (kwalitatief verschil) of alleen in *ernst* (kwantitatief verschil). Dit kan consequenties hebben voor de behandelaanpak bij patiënten die onvoldoende reageren op een reguliere behandeling. In het eerste geval zou de aanpak bijvoorbeeld vooral gericht kunnen worden op de gevonden symptoomverschillen. In het tweede geval zou de behandelaanpak zich meer kunnen richten op gemeenschappelijke, transdiagnostische factoren die ten grondslag liggen aan de verschillende stoornissen. Naast het identificeren van bepaalde subgroepen is in de studies onderzocht hoe de gevonden subgroepen geassocieerd zijn met verschillende factoren uit deze patientengroepen, zoals bijvoorbeeld aantal en kenmerken van PTE's, coping stijlen, geslacht en persoonlijkheidsdimensies.

In ***hoofdstuk 4*** presenteerden we een onderzoek bij getraumatiseerde Nederlandse veteranen, die in behandeling waren bij ARQ Centrum'45. We gebruikten meetinstrumenten om de aanwezigheid en ernst van een breed spectrum van algemene psychopathologie en van PTSS-symptomen te meten. Er werden drie subgroepen van patiënten geïdentificeerd die gekarakteriseerd konden worden door verschillen in de ernst van het algehele symptoom profiel, zonder dat er kwalitatieve verschillen werden gevonden. Dit betekent dat de scores van algemene psychopathologie en PTSS qua ernst nauw met elkaar verbonden waren. Vervolgens kon worden aangetoond dat veteranen in de twee ernstigste subgroepen een groter aantal soorten traumatische gebeurtenissen rapporteerden, een hoger niveau van vermijdende coping en meer disfunctionele persoonlijkheidskenmerken hadden dan veteranen in de minst ernstige groep.

In ***hoofdstuk 5*** werd een onderzoek beschreven bij getraumatiseerde vluchtelingen die eveneens in behandeling waren bij ARQ Centrum'45. In deze studie werd een nog breder scala aan symptomen van psychopathologie gemeten: de totale ernstscores van PTSS-symptomen, de ernst van de drie verschillende PTSS-symptoomclusters van DSM-IV (herbeleving, vermijding en verhoogde prikkelbaarheid) en de ernst van angst, depressie en somatisatie symptomen. Onze belangrijkste bevindingen kwamen overeen met die van het veteranenonderzoek: ook hier vonden we drie subgroepen die alleen verschilden wat betreft de algehele ernst van de symptomen. Dit gold voor de ernst van de totale PTSS, ernst van depressie, angst, en somatisatie symptomen, maar ook voor de ernst van de aparte symptoomclusters van PTSS. Hierbij werd in de ernstiger symptoomsubgroepen vaker melding gemaakt van een groter aantal soorten traumatische gebeurtenissen. Ook bevonden vrouwelijke vluchtelingen zich significant vaker in de groep met zeer ernstige symptomen.

Concluderend hadden de patiënten een breed symptoomprofiel van psychologische problemen waarbij PTSS slechts één component was en waarin symptomen van PTSS en symptomen van algemene psychopathologie nauw met elkaar verbonden waren. Dit ondersteunt het idee dat symptomen en stoornissen, vooral bij ernstig getraumatiseerde patiënten met langdurige klachten, gezien moeten worden binnen een breder kader van posttraumatische psychopathologie dan alleen PTSS.

PTSD criteria en behandelresultaat

Heterogeniteit van symptomen kan worden beschouwd in de context van comorbiditeit, zoals is gedaan in de studies in de hoofdstukken 4 en 5, maar kan ook worden beschouwd *binnen* een stoornis. Dat is zeker relevant voor PTSS, omdat PTSS een zeer breed scala aan symptomen omvat en als de meest heterogene stoornis van de DSM-5 wordt gezien[16] (Galatzer-Levy & Bryant, 2013; Hoge et al., 2016). Dit bracht ons ertoe te onderzoeken of er specifieke PTSS symptoomclusters zijn te vinden die geassocieerd zijn met behandelresultaat. Er kan immers worden beargumenteerd dat de ernst van bepaalde PTSS-symptoomclusters een beter of slechter behandelresultaat voorspelt dan andere.

De studie die is beschreven in ***hoofdstuk 6*** is uitgevoerd onder een groep getraumatiseerde veteranen en politieagenten met langdurige psychische klachten met behulp van een Lineair Mixed Model analyse (LMM), met behulp van bestaande data van ARQ Centrum'45. We onderzochten of twee kwalitatieve kenmerken van PTE's, namelijk 'directe blootstelling versus indirecte blootstelling aan een traumatische gebeurtenis' en 'interpersoonlijke versus niet-interpersoonlijke traumatisering' en de vier verschillende symptoomclusters van PTSS verband hielden met 1) de ernst van PTSS en algemene psychopathologie vóór de behandeling en daarnaast met 2) de verandering van de ernst scores van PTSS en algemene psychopathologie van vóór de behandeling tot na de behandeling. Tenslotte onderzochten we of de invloed van de vier PTSS-symptoomclusters vóór de behandeling niet alleen geassocieerd was met verandering van de totale PTSS ernst scores (van vóór tot na behandeling), maar ook met verandering van de ernst scores van de vier verschillende symptoomclusters (van vóór tot na behandeling).

Ondanks de redelijke behandelresultaten voor deze complexe patiëntenpopulatie (51% van de deelnemers meldde na de behandeling klinisch significante verbetering voor PTSS-symptomen en 45% voor symptomen van algemene psychopathologie), verbeterde een aanzienlijk deel van de patiënten niet. Dit maakte het des te belangrijker om te onderzoeken of specifieke elementen van PTSS verband hielden met de uitkomst van de behandeling.

Eén van de (niet verwachte) bevindingen was dat de door ons onderzochte aard van de PTE's geen invloed had op het behandelresultaat. De verklaring hiervoor kan zijn dat deze patiëntengroep zoveel verschillende traumatypes heeft meegemaakt dat een onderscheid tussen 'directe versus indirecte traumablootstelling' en 'interpersoonlijke versus niet-interpersoonlijke traumablootstelling' niet langer relevant is. Het kan ook zijn dat, omdat de patiënten in deze onderzoeksgroep zoveel en langdurige klachten hebben, de invloed van de traumatische gebeurtenissen overschaduwd is door de vele stressfactoren die tijdens de langdurige klachtenperiode zijn ontstaan.

Daarnaast werd gevonden dat ook de afzonderlijke PTSS-symptoomclusters niet

16 Volgens de DSM-5 definitie van PTSS zijn de 20 symptomen onderverdeeld in vier verschillende symptoomclusters: symptomen van herbeleving (Criterium B), vermijding (C), negatieve veranderingen in cognities en stemming (D), en veranderingen in arousal en reactiviteit (E), allen vanzelfsprekend geassocieerd met de traumatische gebeurtenis (Criterium A) (APA, 2013).

geassocieerd waren met de behandelresultaten voor PTSS en algemene psychopathologie. Alleen een *hogere* ernst van cluster D van PTSS (negatieve veranderingen in cognities en stemming) vóór de behandeling was geassocieerd met een *grotere* verbetering van de symptomen van algemene psychopathologie maar niet van PTSS. Wanneer we niet alleen keken naar de totale PTSS-ernstscores na behandeling, maar naar hoe de afzonderlijke symptoomclusters veranderden, vonden we dat met name een *hogere* ernst van symptoomcluster D vóór de behandeling resulteerde in een *grotere* verbetering op datzelfde cluster D van vóór behandeling tot na behandeling. Een *hogere* ernst van symptoomcluster C vóór de behandeling (vermijdingssymptomen) wordt in verband gebracht met *verminderde* verandering in symptomen van Criterium E (verhoogde arousal en reactiviteit).

Deze resultaten geven aanleiding tot reflectie. Omdat een aanzienlijk deel van de patiënten niet verbeterde, zouden andere dan de door ons onderzochte factoren geassocieerd moeten zijn met behandelresultaat. We beargumenteerden dat de symptoomclusters van PTSS nog steeds erg heterogeen zijn, met twee tot zelfs zeven symptomen binnen een cluster, waardoor het waarschijnlijk is dat gekeken moeten worden naar de rol van de afzonderlijke symptomen in plaats van de symptoomclusters. Ten slotte is het aannemelijk dat niet specifiek de psychopathologie, maar vooral meer context gerelateerde factoren geassocieerd zijn met de uitkomst van de behandeling, zoals psychosociale factoren (levensomstandigheden), aspecten van de persoonlijkheid (coping, neuroticisme) of een voorgeschiedenis van trauma en sociaal-emotionele verwaarlozing in de kinderjaren.

Discussie

In de discussie is op de bevindingen uit deze dissertatie gereflecteerd **(*hoofdstuk 7*)**. Gestart werd met een reflectie op de standpunten in de wetenschappelijke literatuur betreffende 'de echtheid' (*realness*) van psychisch stoornissen. In de geneeskunde zijn sommige stoornissen goed objectiveerbaar aan de hand van een anatomisch of fysiologisch substraat, zoals een gebroken been, een huidtumor of een appendicitis. Bij veel andere stoornissen is dit moeilijker aantoonbaar en bij psychische stoornissen speelt dit nog veel meer. Hierdoor kan 'de echtheid' van stoornissen ter discussie staan. We hebben een 'dimensie in echtheid' gepresenteerd, die loopt van 'realisme', via 'pragmatisme' en 'constructivisme' naar 'scepticisme'. Vanuit de diverse gezichtspunten op de echtheid van psychische stoornissen kunnen vele meningsverschillen die zijn beschreven in de wetenschappelijke literatuur rond PTSS beter worden verklaard.

Vervolgens hebben we onze bevindingen bediscussieerd. De beperkingen van het concept 'potentieel traumatische ervaringen' (PTE's) werden besproken en een dimensioneel model van PTE's werd uitgewerkt, bestaande uit zowel kwalitatieve als kwantitatieve dimensies. Een dergelijk model biedt een meer betekenisvolle en gepersonaliseerde manier om PTE's te definiëren voor zowel patiënt als clinicus. Immers, niet alleen het aantal PTE's zal de psychopathologie van de individuele patiënt beïnvloeden, en mogelijk het behandelresultaat, maar ook de aard van de PTE's. Daardoor kunnen de gedefinieerde dimensies betekenis hebben voor aard en ernst van de klachten en voor behandeling. En zeker biedt het model

aanknopingspunten voor verder wetenschappelijk onderzoek naar effectiviteit van behandeling.

Hierna werd gereflecteerd op heterogeniteit van symptoomexpressie. We beweerden dat vooral het longitudinale beloopsperspectief een belangrijke invloed heeft op het ontwikkelen van psychopathologie: bij een langer durend beloop van klachten gaan diverse stressfactoren bij getraumatiseerde patiënten in toenemende mate een rol spelen. Deze stressfactoren kunnen de klachten verergeren en kunnen tevens zorgen voor het ontstaan van nieuwe symptomen, waardoor zich een mix aan psychopathologie zal ontwikkelen en de grenzen tussen stoornissen makkelijk kunnen vervagen.

De veronderstelde posttraumatische psychopathologie blijkt veelal meer divers dan in de huidige diagnostiek, zoals in die van de DSM met zijn strikte categorieën, wordt aangenomen. PTSS presenteert zich tenslotte in steeds veranderende gedaanten, zoals volgt uit onze onderzoeken. Deze heterogeniteit van symptomen maakt het niet eenvoudig om ondubbelzinnige, goed afgegrensde diagnostische categorieën te definiëren.

Om de diverse bovengenoemde reflecties en bevindingen een plaats te geven in de diagnostiek van posttraumatische psychopathologie, is een model gepresenteerd waarin de principes van ‘subtypering’ en ‘stagering’ worden geïntegreerd. Dit weerspiegelt beter de veelvoudige en veranderende gezichten van posttraumatische psychopathologie, dat wil zeggen respectievelijk de heterogeniteit van posttraumatische symptomatologie en de beschrijving van het beloop van psychopathologie bij een individu in de loop van de tijd. Bovendien kan het mogelijkheden bieden om meer toegespitste behandelmethoden toe te passen om zo de effectiviteit van traumabehandeling te vergroten. Aan de hand van drie cases wordt dit diagnostische model geïllustreerd.

REFERENTIES

American Psychiatric Association, APA (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

American Psychiatric Association, APA (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author.

Galatzer-Levy, I.R., & Bryant, R.A. (2013). 636,120 ways to have posttraumatic stress disorder. *Perspectives on Psychological Science*, *8*(6), 651-662. doi. org/10.1177/1745691613504115

Hoge, C.W., Yehuda, R., Castro, C.A., McFarlane, A.C., Vermetten, E., Jetly, R., Karestan C., Koenen, K.C., Greenberg, N, Shalev, A.Y., Rauch, S.A.M., Marmar, C.R., & Rothbaum, B.O. (2016). Unintended consequences of changing the definition of posttraumatic stress disorder in DSM-5: critique and call for action. *JAMA Psychiatry*, *73*(7), 750-752. doi:10.1001/jamapsychiatry.2016.0647

Larsen, S. E., Fleming, C. J., & Resick, P. A. (2019). Residual symptoms following empirically supported treatment for PTSD. *Psychological Trauma: Theory, Research, Practice, and Policy*, *11*(2), 207. doi:10.1037/tra0000384

DANKWOORD *Acknowledgements in Dutch*

Het cliché zal ik hier nog maar eens, met een zeker understatement, benoemen: 'promoveren is geen sinecure'. Ik moest regelmatig denken aan de woorden van Berthold Gersons, die lang geleden tegen me zei: 'waarom zou je promoveren? Is het niet veel leuker om een interessant boek te schrijven over een onderwerp dat je aan het hart gaat?' Zijn woorden galmden regelmatig door mijn hoofd, terwijl ik de lange en weerbarstige promotietocht van achter mijn laptop doorliep. Die tocht ging overigens niet van A naar Z. Er was een drukke baan (eigenlijk waren het meerdere banen in één), maar er waren gelukkig ook veel leuke afleidingen binnen een dynamisch gezinsleven. Mijn begeleider, Rolf Kleber, verzuchtte regelmatig: 'volgens mij doe je er veel te veel bij en moet je je meer richten op je promotie'. En steeds kreeg ik door diverse mensen weer die terugkerende vragen: 'Hoe staat het er eigenlijk mee?', 'Wanneer is de datum?', 'Wanneer kan ik het boek ontvangen?'. Ik was eraan begonnen en kon dus niet meer terug …..

Maar ik wilde ook niet meer terug! Het was immers een uitermate boeiende ervaring, een leerschool. Ondanks de tegenslagen, de stress en de diepe dalen, genoot ik van het mooie, creatieve proces. Het proces vanuit een onderzoeksvraag een manuscript te maken dat uiteindelijk uitmondt in een mooi artikel. Ik kon daar heel erg van genieten. Bij dit proces waren velen in mijn omgeving *direct*, en nog velen meer *indirect*, betrokken. Mogelijk zullen sommigen hier in dit dankwoord niet worden genoemd, hetgeen mij dan oprecht spijt. Volledigheid, perfectie, het goed willen doen, het zal voor mij een worsteling blijven.

Paul Boelen, mijn promotor. Je bent een man van de scherpte. Wanneer alle auteurs het manuscript hadden beoordeeld, wist jij als laatste toch nog weer de vinger op soms cruciale, zere plekken te leggen. Je vermaande mij regelmatig om mijn bloemrijke, beschouwende schrijfstijl te beteugelen, want het moest wel 'concreet' en 'wetenschappelijk' zijn! Bij dit alles lag je droge humor altijd op de loer. En naast de taal, was je ook in de statistische methoden sterk, en wist je met een feilloze blik uit tabellen soms 'vreemde' uitkomsten te identificeren. Dank dat je mijn promotor wilde zijn.

Rolf Kleber, bij jou ben ik mijn promotie ooit begonnen. Om recht te doen aan onze lange samenwerking daarom een iets uitgebreidere tekst voor jou. Het promoveren kwam bij mij in de eerste jaren langzaam op gang. Je maande me vaak tot meer vaart, maar dat heeft niet erg geholpen. En toen ging je met emeritaat en verloor je na vijf jaar ook je 'ius promovendi'. Dat speet ons beide zeer, want in onze fijne overleggen was je altijd enorm steunend, respectvol en inhoudelijk inspirerend. Maar je bent gelukkig als begeleider en supervisor zeer actief betrokken gebleven en voor mij ben je naast Paul altijd blijven bestaan als 'mijn promotor'. We vonden elkaar op diverse gebieden, maar vooral als twee wat beschouwende en reflecterende personen met een bovenmatige voorliefde voor de geschiedenis van psychotrauma. Inhoudelijk heb ik veel van je geleerd over de psychotraumatologie. Je bent tenslotte een van de belangrijkste nestors op het gebied van psychotrauma in Nederland en hebt een indrukwekkende hoeveelheid kennis opgebouwd. Je uitroep 'dit heb ik in de jaren tachtig al

eens beschreven!' zette me vaak weer met beide benen op de grond. Maar ik heb niet alleen veel geleerd van je kennis, maar ook van je fantastische taalgevoel en je scherpe manier om teksten te becommentariëren, en vooral van jou als bijzonder prettig mens.

Jeroen Knipscheer, mijn copromotor. Je was altijd bereid mee te denken en mee te lezen, met veel geduld en acceptatie. Je stimuleerde me altijd positief als ik weer eens de nodige twijfels had over een paper: je doorzag altijd snel of een paper de moeite waard was. Bijzondere kenmerken zijn voorts je consequente zwarte kledingstijl, waarbij ik soms op een enkele inconsistente, zeer donkerblauwe frivoliteit wist te wijzen, maar vooral je unieke, perfect gedoseerde combinatie van humor, ironie en bovenal zelfspot. Veel dank voor je begeleiding.

Dank aan de leden van de beoordelingscommissie voor de bereidheid om de manuscripten van deze dissertatie te lezen en te beoordelen: *prof. dr. Marrie Bekker, prof. dr. Gemma Blok, prof. dr. Mario Braakman, prof. dr. Elbert Geuze* en *prof. dr. Marian Jongmans.*

Niels van de Aa, een betere statisticus/ methodoloog kan ik me niet voorstellen. Je bent scherp en nauwkeurig. Voor diverse papers heb ik menig uurtje naast je gezeten om nauwgezet alle stappen te doorlopen en vooral te doorgronden en daar heb ik heel veel van geleerd. Gelukkig (voor mij) ging dat gepaard met vele humorvolle momenten die het turen naar alle rijen getallen onderbraken.

Annelies de Haan, je haakte als methodoloog pas op het laatst in dit promotieproject aan. Maar je deed dit met heel veel enthousiasme en was goed bereikbaar. Je duidelijkheid en steun hebben me heel goed geholpen om het overzicht te behouden bij alle analyses die we uitvoerden voor het laatste artikel.

Mijn dank gaat ook uit naar de coauteurs van de artikelen. *Michiel van Vreeswijk*, lang geleden heb ik samen met jou de 'eerste schreden' gezet op onderzoeksgebied, in Delft. Onze samenwerking was heel plezierig en kende een grote ambitie. Fijn dat we altijd contact hebben gehouden en uiteindelijk hebben onze inspanningen van destijds geleid tot een interessante publicatie. *Joris Haagen* en *Dorien Eising*, ook jullie bedankt voor de plezierige samenwerking en de fijne bijdragen van ieder aan een artikel.

En wat betreft het huidige boek. *Taschelna Bodo*, veel dank voor al je creativiteit. Met een vage opdracht ('iets met gezichten') wist je een heel erg mooie omslag te ontwerpen. Ook *Marleen van de Ven*, dank voor de ondersteuning bij de planning, het weer opschuiven van de planning en dan toch kon uiteindelijk het in gang zetten van de uitgave van dit proefschrift.

De Raad van Bestuur van ARQ Nationaal Psychotrauma Centrum: *Melina Kappeyne van de Coppello-Rakic* en *Ate Osinga*, veel dank voor het vertrouwen en de steun om dit proefschrift af te ronden. *Jan-Wilke Reerds*, voormalig voorzitter Raad van Bestuur: we hebben heel erg lang en zeker plezierig samengewerkt. Dank voor je steun en voor de mooie gesprekken die we vaak hadden. *Jan Schaart*, voormalig bestuurder van ARQ: dank dat je mij altijd je vertrouwen en steun gaf wanneer ik soms twijfelde over de voortgang.

De directie ARQ Centrum'45. *Twan Driessen*, mijn eerste collega directeur bij ARQ Centrum'45, dank voor alle vertrouwen vanaf het moment dat ik mijn eerste voorzichtige schreden op het onderzoekspad zette. Ik hoop dat je in het verre Azië dit boek af en toe

eens zult doorbladeren. *Eddy Sas*, mijn tweede collega-directeur, wat hebben we plezierig samengewerkt. Beide hadden we dezelfde ambitie, namelijk om ARQ Centrum'45 steeds verder te ontwikkelen als landelijk specialistisch psychotrauma instituut. Dank voor je prettige, mensgerichte stijl en je altijd positieve houding. *Athanasios Maras*, mijn opvolger als inhoudelijk directeur, je hebt met een vloeiende beweging het stokje overgenomen en op jouw eigen wijze het beleid verder ontwikkeld. Je ondersteunende en betrokken manier van leidinggeven ervaar ik als zeer waardevol.

Jarenlang was het managementteam (MT) van ARQ Centrum'45 mijn team en de leden mijn collega's. Aanvankelijk begon ik als leidinggevende bij Centrum '45 De Vonk en bestond het team uit de afdelingshoofden, met onder andere *Jelly van Essen*, *Hans Rohlof* en *Ronald Rijnders*. Later, als lid van de directie van ARQ Centrum'45, waren er frequente wisselingen in de samenstelling van het MT. Maar de laatste jaren was er altijd een constante: de soms chaotische maar altijd gezellige MT vergaderingen en de openhartige individuele werkoverleggen. Dank *Boud van der Huls, Magda Langemaire, Karin Klaverveld, Cathy van Dooren, Cri-cri Gouw, Astrid van Engen, Astrid Conzen, Gerda Heslinga, Esther Schoonbeek* en *Pim Scholte.*

Mijn laatste team was bij ARQ Academy en bestond uit *Willeke Kuipers, Ellen Velzeboer, Esther Kok, Lidia Dias Oliveira – Bruno* en *Natasja Groenhuijzen*. Het was ontzettend gezellig met jullie en ik vond het vooral heel mooi om zo geïnspireerd samen te werken om ARQ Academy steeds professioneler en zichtbaarder te maken. Met beperkte middelen is dat heel goed gelukt!

Natuurlijk wil ik alle collega's binnen ARQ met wie ik al die jaren heb samengewerkt bedanken, en dan vooral de vele *collega's van de behandelafdelingen, secretariaten, huishoudelijke en facilitaire dienst en ICT*, van wie ik sommigen al heel erg lang ken. Jullie bevlogenheid voor de patiënten, voor het vakgebied en voor ARQ als organisatie is indrukwekkend en deze eigenschap vormt een essentiële rode draad door geheel ARQ. Ook dank aan de directies van ARQ, waar ik als directeur regelmatig fijn mee heb samengewerkt, *Caroline Six*, *Remco Roos* en *Annelieke Drogendijk*. Apart vermeld ik hier graag de collega's van de ARQ bibliotheek: *Jonna Lind*, *Sandra de Loor* en *Anne-Vicky Carlier*. Ongelofelijk, hoe jullie altijd snel en klantgericht bereid waren mijn prangende vragen te beantwoorden.

Veel dank aan de vele vrienden, familieleden en oud-collega's. Slechts een enkeling wil ik hier noemen omdat het gaat om beroepsgenoten die ik al heel lang ken, vanzelfsprekend zonder anderen te kort te doen: *Arnold*, jou ken ik al vanaf mijn AIOS tijd in Centrum'45 en *Paul* en *Rinus*, met jullie begon ik mijn carrière als psychiater op de PAAZ van het Reinier de Graaf Gasthuis in Delft. Wat fijn dat we zo lang vrienden zijn gebleven. Ook natuurlijk dank aan de vele collega's uit de diverse landelijke netwerken met wie ik tijdens mijn werk in al die jaren heb samengewerkt.

Mijn ouders en mijn zus, die dit niet meer kunnen meemaken, hebben op hun geheel eigen wijze bijgedragen. Mijn vader, die in de oorlog als zeer jonge man huis en haard moest verlaten, veel ingrijpende gebeurtenissen heeft meegemaakt en nooit het woord 'trauma' gebruikte, maar op latere leeftijd uren achter zijn bureau over zijn oorlogservaringen schreef in gedichten

en teksten. Mijn moeder, die als hele jonge Duitse vrouw kort na de oorlog met haar geliefde naar Nederland kwam en vanaf die dag probeerde niet meer Duits te zijn. En mijn zus, die me de liefde voor literatuur en voor Bach heeft bijgebracht.

Tenslotte dank voor degenen om wie het leven uiteindelijk draait, mijn gezin. Mijn drie lieve kinderen, *Sander*, *Nina* en *Benthe* (om misverstanden te voorkomen: op volgorde van leeftijd). Zonder jullie zou het leven niet zijn zoals het nu is. Ik geniet nog dagelijks van hoe jullie jezelf ontwikkelen als drie geweldige volwassenen, die goed, stevig en vooral als hele lieve mensen in het leven staan. Sander en Nina treden tevens op als paranimfen en Benthe als contactpersoon en ceremoniemeester. En natuurlijk geniet ik van de drie lieve schoonkinderen, *Hanneke*, *Luuk* en *Martijn* (om misverstanden te voorkomen: op alfabetische volgorde). Jullie horen inmiddels helemaal bij het gezin en ik ben blij dat jullie daar ook volop deel van uitmaken. De laatste woorden van dank zijn vanzelfsprekend voor mijn liefste *Marieke*. We hebben in al die vele jaren zo veel meegemaakt. Nare, verdrietige maar gelukkig vooral heel erg veel mooie ervaringen. En er liggen nog zo veel mooie momenten in het verschiet! Jij hebt mij geleerd dat het leven niet alleen bestaat uit verplichtingen, maar ook uit het genieten van de dagelijkse dingen, zoals de kinderen, de natuur, wolkenluchten, reizen, filmfestivals, musea of gewoon een fietstochtje maken. In de komende jaren zal moeten blijken of ik het kan, genieten zonder verplichtingen. Maar ik weet zeker, dat jij mij daarbij zult inspireren en dat het dan ook gaat lukken. Want het zal gaan zoals het hoort: na het schrijven van een proefschrift start een nieuw begin en soms ook een nieuwe carrière. Die van mij zal een carrière zijn met veel vrijheid, met reizen, met veel tijd voor alle geliefde mensen die om mij heen staan en soms ….. heel soms …. ook nog wel met wat 'werk'. Met een *beetje* 'geschiedenis van trauma' (met Rolf) en natuurlijk een *beetje* 'Narratieve Exposure Therapie' zal ik des te meer genieten van alle zeeën van vrije tijd.

ABOUT THE AUTHOR

Ruud Jongedijk is psychiatrist (MD), licensed psychotherapist (BIG registered) and certified psychotrauma therapist (NtVP/ ESTSS). He was born and raised in Bergen (province North-Holland), the Netherlands. After studying psychology for two years (1977-1979), he attended medical education (1979-1987) (both at the University of Amsterdam). He followed his training in psychiatry at the psychiatric department of the Academic Medical Center in Amsterdam (1988-1992) (prof. dr. F. de Jonghe; prof. dr. B. Gersons) and at ARQ Centrum'45 (1992-1993) (prof. dr. H. Rooijmans; prof. dr. R. Abraham).

As a psychiatrist, he started a position at the psychiatric department of a large general hospital (Reinier de Graaf Gasthuis, Delft; 1993-1999), of which he became head in 1997. Two years later he became clinical director of various locations of a large mental health care institution (GGZ Delfland; 1999-2004) and later also deputy head of the psychiatric residency training (2001-2004).

In 2004, he joined the management team at ARQ Centrum'45 and headed the two locations of the department for traumatized refugees ('*De Vonk*') at Noordwijkerhout and Amsterdam. From 2009 to 2021 he was clinical and medical director of ARQ Centrum'45 (ARQ National Psychotrauma Centre). From 2021 to 2024 he was senior advisor of the board of directors of ARQ National Psychotrauma Centre, was working as a psychiatrist at the outpatient department of ARQ Centrum'45 and was associated with ARQ Academy as senior advisor, trainer and supervisor.

He fulfilled several additional tasks, including, among others, Chairman of the 'Landelijke Klankbordgroep GGZ voor Asielzoekers' (National Mental Healthcare Committee for Asylum Seekers) at De Nederlandse GGZ (2009-2021), member of the Visitation Committee of the 'TOPGGz Foundation' (2015-2024), advisor for the translation of the chapter 'Trauma and Stressor Related Disorders' in the Dutch DSM-5 Handbook (2014), member/ advisor of several guidelines committees (among others, 'Zorgstandaard Trauma en Stressorgerelateerde Stoornissen'; 'Guidelines for PTSD' of the Dutch Society of Psychiatry; project 'Zinnige Zorg PTSS' of Zorginstituut Nederland). He was involved in the CAPS-5 and PCL-5 translation project (2013-2014) and was/ is involved in various scientific studies on trauma and PTSD.

He started his PhD dissertation under the supervision of Professor Rolf Kleber, while during the course of the project, Professor Paul Boelen became first supervisor ('promotor') and Jeroen Knipscheer, PhD, co-supervisor ('co-promotor').

He has always had a strong affinity with treating traumatized patients. Since 2009, he has enthusiastically immersed himself in what was then a relatively new trauma-oriented therapy, 'Narrative Exposure Therapy' (NET). He introduced NET in the Netherlands and has set up certified trainings and supervisions. He currently provides training, supervision, lectures, and workshops. He wrote the Dutch NET handbook (2014), which was published in 2021 in a completely revised edition. He recently trained several Ukrainian psychologists in NET and his NET book, in a slightly abridged version, will be published in Ukrainian. He is involved in

various NET projects, such as the High-Intensive NET project (HI-NET) and NET for patients with a mild intellectual disability (NET-MID). In addition to his activities as a NET expert, he will also focus on another passion in the coming years, the history of psychotrauma.

PUBLICATION LIST

PUBLICATIONS

Publications in English

Jongedijk, R.A., Boelen, P.A., Knipscheer, J.K., & Kleber, R.J. (2023). Unity or anarchy? A historical search for the psychological consequences of psychotrauma. *Review of General Psychology, 27,* 3, 303-319. https://doi.org/10.1177/10892680231153096

Jongedijk, R.A., Vreeswijk, M..F. van, Knipscheer, J.W., Kleber, R.J., & Boelen, P.A. (2022). The relevance of trauma and re-experiencing in PTSD, mood, and anxiety disorders. *Journal of Loss and Trauma, 28*, 4, 404–420. https://doi/10.1080/15325024.2022.2116782

Van der Heijden, A.C., Hofman, W.F., de Boer, M., Nijdam, M.J., van Marle, H.J.F., Jongedijk, R.A., Olff, M., & Talamini, L.M. (2022). Sleep spindle dynamics suggest over-consolidation in post-traumatic stress disorder. *Sleep*, *45*, 9, https://doi.org/10.1093/sleep/zsac139

Velu, M.E., Martens, I., Shabab, M., de Roos, C., Jongedijk, R.A., Schok, & M., Mooren, T. (2022). Trauma-focused treatments for refugee children: Study protocol for a randomized controlled trial of effectiveness of KIDNET versus EMDR therapy versus a waitlist control group (KIEM). *Trials 23, 347.* https://doi.org/10.1186/s13063-022-06178-z

Mauritz, M.W., Goossens, P.J.J., Jongedijk R.A., Vermeulen, H., & van Gaal, B.G.I. (2022). Investigating the efficacy and experiences with Narrative Exposure Therapy in severe mentally Ill patients with comorbid Post-traumatic Stress Disorder receiving Flexible Assertive Community Treatment: A mixed methods study. *Frontiers in Psychiatry*. https://doi/10.3389/fpsyt.2022.804491

Strijk P., Bedawi, V., & Jongedijk, R.A. (2020). A new treatment approach for PTSD: High-Intensive Narrative Exposure Therapy (HI-NET). *Child Abuse and Maltreatment: Interdisciplinary Journal/ Maltrattamento e Abuso all'Infanzia, 3*, 51-62. https://doi/10.3280/MAL2020-003005

Mauritz, M.W., Gaal, B.G.I. van, Goossens, P.J.J., Jongedijk R.A., & Vermeulen, H. (2020). Treating severely mentally ill patients with narrative exposure therapy for comorbid post-traumatic stress disorder: a single group pre-test-post-test repeated-measures study. *BJPsych Open, 7*(1), e12, 1-8. https://doi.org/10.1192/bjo.2020.124

Jongedijk, R.A., Eising, D.D., Van der Aa, N., Kleber, R.J., & Boelen, P.A. (2020). Severity profiles of posttraumatic stress, depression, anxiety, and somatization symptoms in treatment seeking traumatized refugees. *Journal of Affective Disorder,* 266, 71-81. https://doi/org/10.1016/j.jad.2020.01.077

De Boer, M., Nijdam, M.J.., Jongedijk, R.A., Bangel, K., Olff, M., Hofman, W.F., & Talamini, L.M. (2020). The spectral fingerprint of sleep problems in Post-Traumatic Stress Disorder. *Sleep*, 43(4). https://doi.org/10.1093/sleep/zsz269

Lely, J.C.G., Smid, G.E., Jongedijk, R.A., Knipscheer, J.W., & Kleber, R.J. (2019). The effectiveness of narrative exposure therapy: A review, meta-analysis and meta-regression analysis. *European Journal of Psychotraumatology*, *10*:1. https://doi.org/10.1080/20008198.2018.1550344

Jongedijk R.A., Van der Aa N., Haagen J.F.G., Boelen, P.A., & Kleber, R.J. (2019). Symptom severity in PTSD and comorbid psychopathology: A latent profile analysis among traumatized veterans. *Journal of Anxiety Disorders*, *62*, 35-44. https://doi.org/10.1016/j.janxdis.2018.11.004

Boeschoten, M.A., Van der Aa, N., Bakker, A., Ter Heide, F.J.J., Hoofwijk, M., Jongedijk, R.A., Van Minnen, A., Elzinga, B.M., & Olff, M. (2018). Development and evaluation of the Dutch Clinician-Administered PTSD Scale for DSM-5 (CAPS-5). *European Journal of Psychotraumatology*, 9:1, https://doi.org/10.1080/20008198.2018.1546085

Fragkaki, I., Roelofs, K., Stins, J., K., Jongedijk, R.A., & Hagenaars, M.A. (2017). Reduced freezing in PTSD patients while watching affective pictures. *Frontiers in Psychiatry, section Psychopathology.* https://doi.org/10.3389/fpsyt.2017.00039

Mauritz, M.W., Gaal, B.G.I. van, Jongedijk, R.A., Nijhuis-van der Sanden, M.W.G., Schoonhoven, L., & Goossens, P.J.J. (2016). Narrative Exposure Therapy for Posttraumatic Stress Disorder associated with repeated interpersonal trauma in patients with Severe Mental Illness: A mixed methods convergent design study. *European Journal of Psychotraumatology, 7(1), 32473.* https://doi.org/10.3402/ejpt.v7.32473

Fragkaki, I., Stins, J., Roelofs, K., Jongedijk, R.A., & Hagenaars, M.A. (2016). Tonic Immobility differentiates stress response in PTSD. *Brain and Behavior, 00:1–7. e00546.* https://doi.org10.1002/brb3.546

Jongedijk, R.A. (2014). Narrative Exposure Therapy (NET): An evidence-based treatment for multiple and complex trauma. *European Journal of Psychotraumatology, 01*, 5, 26522. https://doi.org/10.3402/ejpt.v5.26522

Jongedijk, R.A., I.V.E. Carlier, J.N. Schreuder, & B.P.R. Gersons (1996). Complex Posttraumatic Stress Disorder: An exploratory investigation of PTSD and DES NOS among Dutch war veterans. *Journal of Traumatic Stress*, *9*, 3, 577- 586. https://doi.org/10.1007/BF02103666

Publications in Dutch

Jongedijk, R.A. (2023). Psychotrauma in beweging: een persoonlijke beschouwing. *Impact Magazine, 01*, 12-15.

Jongedijk, R.A. & Eiting, G.E. (2022). Narratieve Exposure Therapie: NET. *GZ-Psychologie*, *6*(22), 21-23.

Jongedijk, R.A. (2015). De Posttraumatische stress stoornis in de DSM-5. White paper. Boom, Amsterdam. http://www.boompsychologie.nl/nieuws/nieuws/nieuwsartikel/223/Gratis-artikel-Ruud-Jongedijk-over-PTSS-in-de-DSM-5

Jongedijk, R.A. (2014). Trauma in China - Post-Traumatic Stress: State of the Art Research and Clinical Implications for China. Congresverslag. *Cogiscope*, *04*(14), 38-39.

Jongedijk, R.A., Laban, C.J., Drozdek, B., van der Heide, D.H., & Rohlof, J. (2010). Asielzoekers en vluchtelingen: complexe diagnostiek en behandeling. *Tijdschrift voor Psychiatrie*, suppl. 1, 217-220.

Jongedijk, R.A. (2010). Begeleiding en behandeling van patiënten met een posttraumatische stress stoornis. *Modern Medicine,4,* 127-130.

Jongedijk, R.A. (2010). Diagnostiek van de Posttraumatische stress stoornis. *Modern Medicine, 3,* 111-115.

Jongedijk, R.A. (2009). Opkomst en teloorgang van Bastiaans. *Cogiscope*, *02*(09), 8-11.

Jongedijk, R.A. (2008). De gevolgen van psychotraumatische gebeurtenissen: meer dan PTSS alleen? *Cogiscope*, *01*(08), 13-17.

Jongedijk, R. A. (2006). Wat te doen aan angstdromen gerelateerd aan gebeurtenissen uit het verleden? *Vademecum Permanente Nascholing Huisartsen*, pp. 2760-2763. Houten: Bohn Stafleu van Loghum.

Jongedijk, R.A. & Hoekstra, M.J. (2006). GGZ voor asielzoekers: teveel, voldoende of te weinig? *Cultuur Migratie Gezondheid*, *3*(3), 148-159, 2006.

Jongedijk, R.A. (2006). Hoe effectief is medicatie bij de posttraumatische stress stoornis? Een kort overzicht voor de praktijk. *Cogiscope, 02*(6), 28-31.

Jongedijk, R.A. (2006). Een briefje van de dokter. Boekbespreking. *Cogiscope*, *01*, 28-31.

Jongedijk, R.A. (2006). Hoe effectief is medicatie bij de posttraumatische stress stoornis? Een kort overzicht voor de praktijk. *Psyfar Nascholingstijdschrift voor psychofarmacologie*, *01*, 34-36.

Jongedijk, R.A. & Hoekstra, M.J. (2006). Ondanks krimp toch groei. Een Quick Scan onderzoek naar behoefte en gebruik van de geestelijke gezondheidszorg door asielzoekers in Nederland. Uitgave GGZ Nederland.

Jongedijk, R.A. (2005). Broken Spirits. Boekbespreking. *Cogiscope, 02*(5), 30-33.

Berg, van den M.P. & Jongedijk, R.A. (2004). Farmacotherapie van de posttraumatische stress stoornis. Een literatuuroverzicht van placebo gecontroleerd onderzoek. *Tijdschrift voor Psychiatrie, 6*, 357-368.

Vreeswijk, M.F. van, 't Hoen, T., Teeuwen, P., Jongedijk, R.A., & Kattemölle, M. (2004). Een psychiater als consultatiegever voor eerstelijnshulpverleners. *Tijdschrift voor Psychiatrie*, *4*, 249-253.

Vreeswijk, M.F. van, Arts, W.J.J.M., Kho, K.H., & Jongedijk, R.A.. (2003). Cognitieve gedragstherapie bij een patiënt met medicatieresistente paranoïde schizofrenie. *Tijdschrift voor Psychiatrie, 11*, 709-713.

Jongedijk, R.A. (2002). De gevolgen van psychotraumatische gebeurtenissen. *Bijblijven, Huisartsen Nascholing*, *18*(2), 56-66.

Jongedijk, R.A. Psychiatrische diagnostiek en het DSM-systeem. Een kritisch overzicht. (2001). *Tijdschrift voor Psychiatrie*, *5*, 309-319.

Jongedijk, R.A.. Hartziekte, hyperventilatie of paniek? Diagnostiek en behandeling van de paniekstoornis. (1998). *Hart Bulletin*, *29*, 181- 188.

Jongedijk, R.A. (1997). Een posttraumatische stress stoornis na een auto ongeval. *Patient Care*, *3*, 25- 30.

Jongedijk, R.A., Carlier, I.V.E., Schreuder, J.N., & Gersons, B.P.R. (1995). Is er een plaats voor de Complexe Posttraumatische Stress Stoornis? PTSS en DES NOS nader beschouwd. (1995). *Tijdschrift voor Psychiatrie*, *37*(1), 43-54.

Jongedijk, R.A. (1993). Posttraumatische verschijnselen in de literatuur: is fictie ook vakwerk? *Tijdschrift voor Psychiatrie*, *35*(5), 287- 302.

BOOKS

Jongedijk, R.A. (2021). *Levensverhalen en Psychotrauma*. *Narratieve Exposure Therapie in theorie en praktij*k, 2e geheel herziene druk. Uitgeverij Boom, Amsterdam.

Jongedijk, R.A. (2014). *Levensverhalen en Psychotrauma. Narratieve Exposure Therapie in theorie en praktijk*. Uitgeverij Boom, Amsterdam.

BOOK CHAPTERS

Jongedijk, R.A. (2020). *Narratieve Exposure Therapie*. In: A. van Emmerik & A. Greeven (Eds.), Handboek Exposure (pp. 207-232). Boom Uitgevers, Amsterdam

Jongedijk, R.A., & Simon, E. (2018). *Posttraumatische-stressstoornis*. In: E. Simon, E.de Hullu, G. Smeets, H.T. van der Molen (Eds.), Handboek Klinische Psychologie deel 2 (3e druk) (pp. 223-238). Noordhoff Uitgevers, Groningen/Utrecht.

Klaassens, E., Kleber, R. & Jongedijk, R.A. (2017). *De Zorgstandaard Trauma- en stressor gerelateerde stoornissen*. In: A. Driessen en W. Langeland (Eds.), Praktijkboek Psychotrauma (pp. 150-152). Amsterdam: Uitgeverij SWP.

Schauer, M., Jongedijk, R.A., Kaiser, E. (2015). *Narrative Exposure Therapy for Children and Families - Integrating Memories of Trauma, War and Violence*. In: Esther Captain and Trudy Mooren (Eds.), Family, Generations and War. Historical, psychological and artistic views. Conference Proceedings (pp. 81-96). Amsterdam: National Committee for 4 and 5 May.

Jongedijk, R.A. (2012). *Narratieve Exposure Therapie*. In: E. Vermetten, R.J. Kleber en O. van der Hart (Eds.), Handboek Posttraumatische stress stoornissen (pp. 551-564). Utrecht: De Tijdstroom.

ASSESSMENT INSTRUMENTS

Boeschoten, M.A., Bakker, A., Jongedijk, R.A., van Minnen, A., Elzinga, B.M., Rademaker, A.R. & Olff, M. (2014). *Clinician Administered PTSD Scale for DSM-5 (CAPS-5)* – Dutch translation. Arq Psychotrauma Expert Groep, Diemen.

Boeschoten, M.A., A. Bakker, R.A. Jongedijk, & M. Olff (2014). *Life Events Checklists for DSM-5 (LEC-5)* – Dutch translation. Arq Psychotrauma Expert Groep, Diemen.

Boeschoten, M.A., A. Bakker, R.A. Jongedijk, & M. Olff (2014). *PTSD Check List for DSM-5 (PCL-5)* – Dutch translation. Arq Psychotrauma Expert Groep, Diemen.

Carlier, I.V.E., Jongedijk, R.A., Lamberts, R.D., & Gersons, B.P.R.. (1992). SCID DESNOS, Dutch translation. *IGP-Project*. Amsterdam: Academisch Medisch Centrum, afdeling Psychiatrie.

PODCASTS

Podcast door ‘de Joost en Yonda Trauma Show’: Narratieve Exposuretherapie (2022). https://www.buzzsprout.com/1440454/10497087 en https://open.spotify.com/show/1KkiIF0v0l-NvKRKwqbGLPz

Podcast Eric de Vroedt (2022). *Leedvermaak trilogie – Episode 2: De verdieping. Met Ruud Jongedijk en Eric de Vroedt. HNTpodcast*. https://nederlandse-podcasts.nl/podcast/hntpodcast/7-leedvermaak-trilogie-ep-2-de-verdieping-met-ruud

Ruud Jongedijk

The Multiple and Changing Faces of Psychotrauma and its Psychological Consequences

The concepts of psychotrauma and post-traumatic stress disorder (PTSD) have become increasingly popular in recent decades, not only in scientific literature and in therapy rooms, but also in the media and in everyday language. Yet, the concept of PTSD only exists since 1980. This dissertation contributes to the knowledge about the manifestations and consequences of trauma-related events by investigating how PTSD emerged and whether the symptoms described in the PTSD concept correspond to those of traumatized patients.

From a historical perspective, it was examined how post-traumatic disorders developed and under what circumstances. A great diversity of described symptoms and syndromes was found. It turned out that these often arose under time-bound social, political, legal and scientific circumstances and were accompanied by intense debates about their right to exist. Using various methodologies, research was then conducted into the manifestations of psychotraumatic events and their psychological consequences. It emerged, among other things, that traumatic events, but also symptoms such as re-experiencing, did not occur specifically in PTSD alone, but also in various other mental disorders. Moreover, patients who had long-term mental complaints showed a wide range of PTSD, depression, anxiety and somatization symptoms, which were closely related to each other. Finally, no indications were found that the four distinct criteria of the current PTSD concept (DSM-5) were associated with treatment outcome.

The dissertation ends with a proposal for a hybrid diagnostic model for patients with post-traumatic psychological complaints. With this model, the heterogeneity of patients' post-traumatic symptomatology can be described in a more personalized way and treatment can be deployed in a more tailored manner.

Ruud Jongedijk is a psychiatrist, psychotherapist and psychotrauma therapist and leading trainer in Narrative Exposure Therapy at ARQ National Psychotrauma Centre.

ISBN 978-94-6496-165-2

arq.org