

Psychopathology and treatment outcomes in a sample of Danish survivors of childhood sexual abuse

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I confirm that the word count of this thesis is less than 100,000 words excluding the title page, contents acknowledgements, summary or abstract, abbreviations, footnotes, diagrams, maps, illustrations, tables, appendices, and references or bibliography

To Dean, Jacob and Alexander, with love

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Abstract

Childhood sexual abuse (CSA) is a serious problem which affects a significant proportion of the global population. It is a robust predictor of a broad range of psychological disorders including posttraumatic stress disorder (PTSD) and depression. Some CSA survivors may require treatment and studies have demonstrated that psychological treatments can be effective in reducing trauma related symptomology. Research has evidenced that CSA survivors are not a homogenous group and substantial variability relating to psychological outcomes (both type and severity) has been found. Further, there is evidence suggesting that CSA survivors vary in relation to the length of time they spend in treatment and how their symptoms change over time. Social support and coping style have been implicated in explaining variation in outcomes among CSA survivors. Given the high prevalence rates and devastating consequences associated with CSA, increasing understanding of the psychological and treatment outcomes, as well as the factors which can explain the wide variation is vital. The aim of the current thesis was to examine three outcomes in a large sample of sexual abuse survivors attending weekly psychotherapy: 1) psychopathology, specifically patterns of co-occurring PTSD, major depressive disorder (MDD), dysthymia, anxiety and somatoform disorder, 2) length of time spent in treatment and 3) PTSD treatment response trajectories. These outcomes were examined in an attempt to identify potentially modifiable risk and protective factors. Indeed, social support and coping styles were explored in relation to each of the outcomes.

Chapter 3 used latent profile analysis (LPA) to examine whether unobservable and meaningful subgroups relating to both disorder type and severity existed within the current sample. Chapter 4 extended on the work in Chapter 3 by examining predictors of the previously identified disorder subgroups. Chapter 5 addressed rates of and predictors of treatment dropout. Chapter

6 utilised latent class growth analysis (LCGA) to examine whether multiple trajectories relating to PTSD treatment response existed. Finally, Chapter 7 extended on the work of Chapter 6 by examining predictors of PTSD treatment response trajectories.

As expected, the studies revealed the presence of distinct subgroups relating to both psychopathology severity and PTSD treatment response. Additionally, relatively high rates of treatment dropout were found prior to the second assessment. In terms of predictors of the outcomes, social support at the time of the CSA was found to be protective in relation to psychopathology and current social support was found to be associated with less severe PTSD as well as PTSD which improved over the course of treatment. In relation to coping style, emotion focused coping was found to be associated with more severe psychopathology. Emotion focused and detached coping styles were associated with more severe PTSD which did not respond to treatment. A number of factors (low education, male, and the experience of childhood neglect or lifetime rape) were identified as predicting less time spent in treatment. Notably, social support or coping were not predictive of length of time in treatment. Results, implications and limitations of each empirical study are discussed within each of the chapters and an overview is provided in Chapter 8.

Abbreviations

AIC	Akaike Information Criteria
ANOVA	Analysis of Variance
APA	American Psychiatric Association
BIC	Bayesian Information Criteria
CBT	Cognitive Behavioural Therapy
CI	Confidence Interval
CPT	Cognitive Processing Therapy
CPTSD	Complex Posttraumatic Stress Disorder
CSA	Childhood Sexual Abuse
CSS	Crisis Support Scale
EM	Expectation Maximisation
HPA	Hypothalamic-Pituitary-Adrenal
HTQ	Harvard Trauma Questionnaire
LCA	Latent Class Analysis
LCGA	Latent Class Growth Analysis
LGMM	Latent Growth Mixture Modelling
LMR-LRT	Lo-Mendell-Rubin Likelihood Ratio Test
LPA	Latent Profile Analysis
MAR	Missing At Random
MCAR	Missing Completely At Random
MCMI	Millon Clinical Multiaxial Inventory
MDD	Major Depressive Disorder
MLCM	Most Likely Class Membership

MLR	Robust Maximum Likelihood
NA	Negative Affect
NESARC	National Epidemiological Survey on Alcohol and Related Conditions
OR	Odds Ratio
PTSD	Posttraumatic Stress Disorder
RAAS	Revised Adult Attachment Scale
SAM	Situationally Accessible Memory
SD	Standard Deviation
SE	Standard Error
SSBIC	Sample size adjusted Bayesian Information Criteria
STAIR	Skills Training in Affective and Interpersonal Regulation
T	Time
TSC	Trauma Symptom Checklist
VAM	Verbally Accessible Memory
WHO	World Health Organisation

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List of publications and conference presentations relating to this thesis

Publications

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Declaration

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A handwritten signature in black ink that reads "Shelley Fletcher". The signature is written in a cursive style with a large initial 'S' and a decorative flourish at the end.

Signed:

Date: 21/02/2018

Chapter 1: Psychopathology and treatment outcomes among survivors of childhood sexual abuse

1.1 Introduction

This thesis aims to increase understanding of psychological and treatment outcomes among adult survivors of childhood sexual abuse (CSA). The studies within this thesis will focus on three outcomes: psychopathology (specifically patterns of co-occurring Axis I disorders), length of time spent in treatment, and Posttraumatic stress disorder (PTSD) treatment response trajectories. In addition to examining these three areas, the studies aim to explore potential risk and protective factors which can explain variation in each of the outcomes examined. All studies will utilise a sample of Danish treatment seeking survivors of CSA. The current chapter has two main aims. The first is to provide an in depth overview of the background literature relating to CSA and the associated outcomes. This section will include the definitions of, risk factors associated with and prevalence rates of CSA. Subsequently, the negative outcomes associated with the experience of sexual abuse and a number of theories which attempt to explain this link will be explored. The second aim, is to provide an overview of the literature specifically relating to the three outcomes of interest (patterns of Axis I disorders, length of time spent in treatment and PTSD treatment response) and the roles of social support and coping style (among other factors) in explaining variation in these outcomes among CSA survivors. Following this the rationale and research aims and objectives will be presented.

1.2 Definitions of CSA

The World Health Organisation (WHO) Consultation on Child Abuse Prevention (1999, p.15) described CSA as; Child sexual abuse is the *“involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared and cannot give consent, or that violate the laws or social taboos of society. Child sexual abuse is evidenced by this activity between a child and an adult*

or another child who by age or development is in a relationship of responsibility, trust or power, the activity being intended to gratify or satisfy the needs of the other person. This may include but is not limited to: The inducement or coercion of a child to engage in any unlawful sexual activity, the exploitative use of child in prostitution or other unlawful sexual practices, the exploitative use of children in pornographic performances and materials.” More recently, the American Psychological Association Board of Professional Affairs, (2013, p. 30) has defined CSA as *“any form of child abuse in which an adult or older adolescent uses a child for sexual stimulation”*. The broad nature of these definitions should be noted, both definitions encompass a wide array of abuse acts which may or may not involve physical touch or force.

1.3 Risk factors associated with CSA

It has been argued that understanding the risk factors (factors associated with an increased risk of experiencing a particular outcome, in this case CSA) can inform clinicians, policy makers and researchers during the development and implementation of prevention/intervention programs (Kazdin, Kraemer, Kessler, Kupfer, & Offord, 1997). Although it has been suggested that CSA can and does occur within all demographic groups (Barth, Bermetz, Heim, Trelle, & Tonia, 2013), research has identified a number of factors which increase the risk of experiencing sexual abuse. Finkelhor and Baron, (1986) suggested that children living in a household where: marital discord was present, at least one biological parent was absent or a step parent was present, had an increased risk of experiencing CSA. Consistent with these early findings, more recent research has also highlighted the importance of family structure as a risk factor for experiencing CSA (Pérez-Fuentes et al., 2013). Additionally, evidence has consistently shown that children who are the most vulnerable are at the highest risk of experiencing CSA. Sedlack et al. (2010) reported that children who were from disadvantaged

families, were homeless or had involvement with the social care system were at a higher risk of experiencing CSA. It has been suggested that children who are vulnerable are more likely to be targeted by a perpetrator and consistent with this idea there is evidence showing that perpetrators purposely seek children who are quieter, passive, appear lonely or are from dysfunctional homes (Budin & Johnson, 1989).

In terms of socio-demographic factors there have been some mixed results. A number of studies have examined the role of ethnicity. Some results have suggested that children of Hispanic or African American ethnicity living in America were at increased risk of experiencing CSA when compared to white children (Tzeng & Schwarzin, 1990). However, contrary to this other evidence has suggested that there are no significant differences between ethnicities (Wyatt, 1985). Finally, there is evidence to suggest that females are at an increased risk of CSA. Prevalence studies have consistently shown that rates of CSA are higher among females when compared to males (Barth et al., 2013; Christoffersen, Armour, Lasgaard, Andersen, & Elklit, 2013; Pereda, Guilera, Forns, & Gómez-Benito, 2009; Stoltenborgh, Ijzendoorn, Euser, & Bakermans-Kranenburg, 2011). It could be argued that this is a true reflection of reality however it has also been suggested that these differences could be due to males being less likely to both recognise and report the abuse (Holmes & Slap, 1998; Welch & Mason, 2007). In summary, there has been research which has identified a number of factors which are associated with an increased risk of experiencing CSA. However, these factors should be interpreted with caution as CSA can affect anyone regardless of gender ethnicity and family structure. Additionally, CSA is thought to be grossly underreported partly due to the stigma and shame which surrounds it (Fergusson, Horwood, & Woodward, 2000) thus making it difficult for the risk factors to be fully understood. Fergusson et al. (2000) argued that further research in this area is required as it remains unclear whether the evidence reflects true

incidence or merely reflects reporting rates. The authors also concluded that the risk of experiencing CSA is likely to be influenced by many factors and that therefore they cannot be decreased to a single risk model.

1.4 Prevalence of CSA

It is thought that CSA has been a historical constant and has always existed within all societies throughout the world (Avery-Clark, O'Neill, & Laws, 1981; Kahr, 1991). Currently, it is a serious public health concern which occurs on a global level (UNICEF, 2014). It has been argued that estimating the prevalence of CSA is vital for the purpose of worldwide health research, for allocating resources and for estimating the burden (Barth et al., 2013). There are a number of ways in which this can be estimated including the use of data from child protection registers, recorded crime statistics and self-report studies (e.g. Barth et al., 2013; Pereda et al., 2009). There have been a number of recent systematic reviews and meta-analyses exploring CSA prevalence rates. Pereda et al. (2009) conducted a meta-analysis of 65 studies from 22 countries using both community and student samples. It was estimated that internationally 19.7% of females and 7.9% of males had experienced a form of sexual abuse before the age 18. In 2011, Stoltenborgh et al. reviewed 217 articles and found similar rates. The overall prevalence rate was 12.7% (females=18%, male=7.6%) when based on self-reports and 4% when based on informant reports (healthcare professionals and child protection services). More recently, Barth et al. (2013) examined rates from 55 studies, across 24 countries and estimated that 8-31% of females and 3-17% of males had experienced a form of CSA. Specifically, in Denmark a national study ($n=4718$) found that 0.7% of males and 6.41% of females had experienced CSA (Christoffersen et al., 2013). On the basis of the above evidence it appears that CSA is a worldwide issue which affects a significant proportion of the population.

However, the prevalence rates in Denmark appear to be substantially lower when compared to the worldwide meta-analyses. Although it is possible that this reflects a true difference in CSA prevalence rates the differences may also be due to differing methodologies or rates of reporting.

Notably, all of the studies and reviews discussed above evidenced higher prevalence rates among females when compared to males (Barth et al., 2013; Christoffersen et al., 2013; Pereda et al., 2009; Stoltenborgh et al., 2011). It could be suggested that females are more likely to experience sexual abuse in childhood but it is also possible that these rates reflect gender differences in abuse disclosure rates. It has been argued due to gender stereotypes males will fear that they will be labelled as weak or as homosexual (if the abuse was perpetrated by a male; Holmes & Slap, 1998). Furthermore, it has been suggested that males are less likely to perceive the sexual acts as abuse suggesting that even when abuse occurs it may not be recognised (Violato & Genuis, 1993). The reviews and meta-analyses have also pointed to a variation in the prevalence rates between studies. It has been suggested that this may be due to differing methodologies, definitions and populations used (Barth et al., 2013).

Concerning assessment type, evidence has consistently shown that informant reports give much lower estimates when compared to self-report (Stoltenborgh et al., 2011). The authors suggested that this could have been due to the methodology of the informant studies which only assessed reports of CSA within a one year time frame whereas many of the self-report studies assessed CSA at any stage during childhood. Additionally, informant studies rely on reports which have been registered by professionals and therefore do not include unreported cases of CSA which may be identified when using a self-report measure (Stoltenborgh et al., 2011). Retrospective self-reports are generally thought to be the most robust method when

examining CSA prevalence rates (Hardt & Rutter, 2004). However, like any assessment this method also has its own limitations. For example, Stoltenborgh et al. (2011) argued that self-reports can be impacted by current mood and experiences and they may not account for the chronicity/severity of the abuse. Moreover, it has also been argued that the retrospective reporting of childhood abuse may not be reliable over time (McCarthy Jones, 2011). Contrary to this, Fisher et al. (2013) evidenced that retrospective self-reports of CSA by individuals experiencing psychosis were consistent over a seven year period and also with clinical case notes. These findings suggest that retrospective reports of CSA have acceptable reliability and validity. Despite the view that self-reports of CSA are one of the most robust methods of measuring CSA, it is widely accepted that these rates are a gross underestimation of the true extent of the problem. CSA is very much a hidden problem within societies and the taboo nature of the subject means there is a higher risk of false negative reports than of false positive reports. (Fergusson et al., 2000; Oates et al., 2000). In line with this, other research has demonstrated that 30-80% of victims do not disclose their experience of CSA until adulthood (London, Bruck, Ceci, & Shuman, 2005) and it has been suggested that some individuals will never report their experience of abuse (Arata, 2002). Moreover, there is also evidence showing that some victims deny the abuse even when the claim has been substantiated (Malloy, Lyon & Quas, 2007). Taken together, the extant literature suggests that estimated rates of CSA indicate a significant global problem, however, the true extent of CSA is extremely difficult to measure and it is likely that the problem of sexual abuse is much more prevalent than research reports.

1.5 Negative outcomes associated with CSA

There is significant heterogeneity in terms of outcomes associated with CSA. While some CSA survivors can remain resilient (Collishaw et al., 2007) in the face of adversity, others suffer from chronic and severe negative consequences (Finkelhor & Browne, 1985; Cantón Cortés, Cortés, & Cantón, 2012). Although many survivors do not experience long term negative consequences, there is a vast body of research which has provided empirical evidence of the robust relationship between the experience of sexual abuse in childhood and long term physical, behavioural and psychological difficulties. Studies have demonstrated that CSA increases the risk of a number of physical health problems in adulthood including chronic pelvic pain, (Latthe, Mignini, Gray, Hills, & Khan, 2006), non-epileptic seizures (Sharpe & Faye, 2006), gastrointestinal problems, cardiopulmonary symptoms, obesity, and chronic pain (Irish, Kobayashi, & Delahanty, 2009). Behavioural outcomes associated with CSA include engagement in risky sexual behaviours such as unprotected sex, sex work and sex with multiple partners (Arriola, Loudon, Doldren, & Fortenberry, 2005) self-injurious and suicidal behaviour, sexual perpetration (Paolucci, Genius, & Violato, 2001) and increased alcohol use (Rind, Tromovitch & Bauserman, 1998).

Concerning psychological outcomes, one of the most commonly reported disorders associated with CSA is PTSD (Chen et al., 2010; Fergusson, McLeod & Horwood, 2013; Kendall-Tackett, Williams, & Finkelhor, 1993; Paolucci et al., 2001). Studies have estimated that between 37% and 43% of CSA survivors meet the criteria for a PTSD diagnosis (Paolucci et al., 2001). PTSD was initially formulated to explain the symptoms associated with combat (Kendall-Tackett & Marshall, 1998). However, it is now widely accepted that there is a broad range of events which could potentially induce PTSD including the experience of CSA (APA, 2013). PTSD was previously characterised by three symptom clusters; avoidance and numbing (for example, avoiding stimuli related to the trauma and avoiding thinking about the trauma), re-experiencing

(for example flashbacks or nightmares relating to the trauma) and hyper-arousal (for example, poor sleep and lack of concentration (APA, 2000)). This criteria has been recently updated with the addition of a fourth symptom cluster; negative alterations in cognition and mood, this includes negative beliefs about oneself or the world, chronic trauma related emotions and distorted feelings of self-blame (APA, 2013). In order to meet the criteria for a PTSD diagnosis the above symptoms must be present for at least one month and must cause clinical impairment (APA, 2013).

There are a number of theories which attempt to explain the mechanisms involved in the development and maintenance of PTSD. For example, the emotional processing theory (Foa & Kozak, 1986) which is based on Lang's theory of fear (1977), postulates that fear is stored in an individual's memory as representations of the stimulus, the responses and the meaning. This has an adaptive purpose as it allows the individual to escape or avoid danger. This theory suggests that PTSD or anxiety occur when these memories do not accurately represent the world, are excessive and resistant to change (Foa & Kozak, 1986). When information in the environment matches information represented in the fear structure this impacts behaviour, cognition and physiology. It is believed that two dysfunctional beliefs (the world is a dangerous place and the self as incompetent) underlie PTSD. These lead to avoidance behaviour which does not allow for dis-confirmatory evidence to be experienced thus the beliefs that the world is dangerous and the self as incompetent are further reinforced (Foa & Kozak, 1986). Consistent with this theory exposure therapy (characterised by confronting trauma associated memories with the aim of disconfirming maladaptive cognitions) has been found to result in a reduction in PTSD symptomology (Foa & Rauch, 2004).

An alternative model: the dual representation theory of PTSD (Brewin, Dalgleish, & Joseph, 1996), states there are two systems involved in storing trauma related memories. One system is referred to as verbally accessible memory (VAM). Within this system the trauma memory is integrated with other autobiographical memories. It can be retrieved when needed and has been consciously processed. The second memory system is referred to as the situationally accessible memory (SAM). These memories contain sensory information relating to the trauma such as the sounds or smells as well as physical trauma responses such as an increase in heart rate. These memories have had less conscious processing when compared to the VAM they cannot be easily accessed and communicated. It is thought that that exposure to certain stimuli such as a smell, sight or sound associated with the trauma can trigger these memories and result in the experience of flashbacks and arousal. Based on this theory there are two main treatment goals: firstly reducing negative emotional reactions associated with negative appraisals and secondly reducing the triggering of the SAM memories (Brewin et al., 1996).

Other theorists have posited that cognitive factors play a role in the development and maintenance of PTSD (e.g. Ehlers & Clark, 2000). One model suggested that PTSD is a result of appraisals which relate to the anticipation of current threat. It is thought that the way that individuals with PTSD process the traumatic event and the consequences of the traumatic event lead to feelings that the threat is currently present. Similar to the emotional processing theory (Foa & Kozak, 1986) described above, this theory suggests that the key maladaptive beliefs are characterised by the view that the world is a dangerous place and the self as incompetent. This theory suggests that the individual is aware of and potentially able to challenge these views however, the emotional processing theory suggests that individuals may not be consciously aware of these views however (Ehlers & Clark, 2000). In line with this theory, longitudinal

research has demonstrated that negative cognitions relating to the trauma and its consequences, as well as maintenance behaviours and coping strategies (for example, avoidance behaviour) are associated with long term PTSD (Dunmore, Clark, & Ehlers, 2001). Also consistent with this theory, randomised control trials have demonstrated that cognitive therapy is effective in reducing PTSD symptomology (Ehlers, Clark, Hackmann, McManus, & Fennell, 2005).

In addition to PTSD, research has demonstrated that a large number of other psychological difficulties are associated with the experience of CSA. Maniglio, (2009) reviewed fourteen reviews, (including 587 studies and over 270,000 participants) which examined the impact of CSA on health. CSA survivors were found to have an increased risk of experiencing personality disorders, suicidal feelings and behaviour, psychotic like symptoms, depressive disorders, anxiety, dissociation, eating disorders, somatic disorders, lower self-esteem, drug abuse disorders and interpersonal problems (Maniglio, 2009). The devastating impact of CSA has also been highlighted by a large scale prospective study. Cutajar et al. (2010) followed the progress of 2,759 Australian children (between the ages of 12 and 43) who had experienced CSA. When this sample was compared to a random population sample the results revealed that CSA survivors had an increased risk of experiencing PTSD, borderline personality disorder, drug and alcohol problems, depression and psychosis. Moreover, there is evidence to suggest that these negative effects remain present in older adults. Chou (2012), examined the impact CSA had on a community sample of (3493) English adults (over the age of 50) and found that CSA was associated with chronic mental health difficulties including: suicidality, self-harm, PTSD, depression and periods of time spent in a psychiatric hospital.

The evidence above shows that the experience of childhood sexual abuse is associated with a broad range of psychological disorders. Indeed, there is also evidence demonstrating that CSA

is associated with high rates of experiencing multiple disorders (Trickett, Noll, & Putham, 2011). It has been argued that complex trauma (multiple and repeated trauma exposures which are often of an interpersonal nature) can lead to symptoms which are not captured by the PTSD model (Cloitre et al., 2009; Herman, 1995). This has led to the proposal of a disorder referred to as Complex PTSD which includes symptoms relating to emotion regulation difficulties, disturbances in relational capacities, changes in attention and consciousness, negatively affected belief system and somatic symptoms in addition to the PTSD symptoms re-experiencing, hyper-arousal and avoidance (Cloitre et al., 2009; Herman, 1995). Despite the above evidence which has demonstrated a clear and strong association between CSA and negative health related outcomes a causal relationship cannot be concluded. Maniglio's (2009) review of 14 reviews examining the effects of CSA concluded that despite the significant relationship between CSA and negative developmental outcomes, this relationship may not be causal in nature. It was suggested that due to methodological limitations and potential confounding variables, disentangling the consequences associated with one specific subtype of childhood abuse is extremely difficult as multiple types of abuse and neglect commonly co-occur (Harding, Burns, & Jackson, 2012; Putnam, 2003; Maniglio, 2009).

Some studies have adjusted for these potential confounding variables and found that CSA specifically relates to certain disorders. For example, one study used a longitudinal design in order to adjust for prospectively assessed covariate factors (Fergusson et al., 2013). This study, which spanned over a period of 30 years, assessed the relationship between CSA and mental health. The results indicated that CSA was associated with an increased risk of mental health problems between the ages of 18 and 30 and as well as low self-esteem, low life satisfaction and poor physical health at age 30. After adjusting for covariates CSA still predicted psychopathology, lower economic status and increased sexual risk taking. Another recent study

(Turner, Taillieu, Cheung, & Affi, 2017), also demonstrated the harmful nature of experiencing CSA (with or without other forms of maltreatment) in a sample of males who participated in the 2004–2005 National Epidemiological Survey on Alcohol and Related Conditions (NESARC; $n = 14,564$). The results revealed that childhood maltreatment was associated with an increased risk of experiencing psychological disorders. However, these effects were larger when the individual had experienced CSA with or without other forms of abuse/neglect thus highlighting that CSA does not always co-occur with other forms of maltreatment and when it is experienced in isolation it can have a harmful impact. In summary, this research suggests that child abuse and neglect in general can have damaging long term effects but CSA may specifically increase the risk (Turner et al., 2017). However, there have also been other studies that have suggested childhood maltreatment/trauma in general predicts psychopathology or that forms of maltreatment other than CSA are more harmful. One literature review concluded that factors such as neglect, emotional abuse and conflict explained more variance in outcomes than CSA (Rind et al., 1998). Other studies have highlighted the importance of examining co-occurring traumas. For example, Paolucci et al. (2001) conducted a meta-analysis of research examining the impact of CSA. The study demonstrated that CSA was associated with negative short and long term developmental outcomes but it was concluded that traumatisation is multifaceted as opposed to a specific syndrome relating to sexual abuse.

It has been argued that the family environment in which CSA is likely to occur contributes to the negative outcomes discussed above. Gold's contextual theory (2000) postulates that the negative effects reported above can be partly explained by the risky and dysfunctional family environment which is likely to be present. A dysfunctional environment, characterised by distant, inconsistent and ineffective parenting, conflict and neglect, and one which does not provide emotional nurturance, guidance or transmission of skills is likely to impact the learning

of daily living skills (such as coping and social skills) which are required for successful functioning in adulthood (Gold, 2000). This in turn contributes to the development and maintenance of psychopathology. Furthermore, a risky and dysfunctional family environment is likely to be present before the occurrence of the CSA and this environment increases the risk of the child developing an insecure attachment style and low assertiveness thus increasing vulnerability (Gold, 2000). Consistent with the contextual theory, research has shown that the families in which CSA survivors grow up in are more likely to be characterised by high levels of dysfunction (Alexander & Schaeffer, 1994). Moreover, there is evidence showing that high levels of family dysfunction (including low levels of affection and high levels of control) are associated with negative developmental outcomes among survivors of childhood maltreatment (Finzi-Dottan & Karu, 2006). Taken together, the empirical evidence suggests that CSA is a risk factor for experiencing negative developmental outcomes. However, a causal relationship cannot be concluded and there is a range of additional risk factors (including other types of abuse and neglect and family dysfunction) which must also be considered when explaining the development and maintenance of psychopathology. It has been argued that considering the contextual factors in addition to the abuse itself, more completely explains the wide reaching and pervasive nature of the psychopathology associated with experiencing sexual abuse in childhood (Gold, 2000).

1.6 Theories explaining the link between trauma and psychopathology

Despite the continually expanding body of literature examining the long term psychological consequences of CSA the exact pathway from sexual abuse during childhood to psychopathology is not well understood. There are numerous theories which have been proposed in an attempt to explain the link between childhood trauma and the associated

pervasive negative outcomes. A number of these theories including, developmental theories relating to complex trauma, the attachment theory, the traumagenic dynamics model of CSA and biological theories of traumatization will be explored within this section. It should be noted that there are some overlaps between some of these theories and it is likely that the complex relationship between CSA and psychopathology cannot be fully explained by a single theory.

1.6.1 Developmental theories

Complex trauma has been described as experiencing multiple and repeated traumatic experiences over sustained periods of time (Cloitre et al., 2009; Ford & Courtois, 2009; Herman, 1995). It is thought that the experience of complex trauma (such as repeated CSA) differs from the experience of a single traumatic event, as it is associated with an increased risk of experiencing more pervasive symptoms over and above PTSD which relate to disturbances in biological and emotional development (Cloitre et al., 2009; Ford & Courtois, 2009; Herman, 1995). The presence of symptoms which exceed the normal PTSD symptoms include emotion regulation difficulties, disturbances in relational capacities, changes in attention and consciousness, negatively affected belief system and somatic symptoms are referred to as complex PTSD (Cloitre et al., 2012) in adulthood and Developmental Trauma Disorder in childhood (van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). It has been suggested that complex traumatic experiences (such as repeated sexual abuse during childhood) can elicit to intense emotions (for example, fear or shame) in the child. The child attempts to deal with the intense emotions by presenting with avoidance behaviours or behaviours which give a perceived sense of control (for example, acting in an aggressive way). Moreover, these regulation difficulties can lead to other emotional (for example, extreme emotional reactions and difficulty returning to baseline), physical (for example, somatic symptoms), cognitive (for

example, a view that the world is dangerous) and interpersonal difficulties (for example feelings of distrust; Cloitre et al., 2012; van der Kolk et al., 2005). It is thought that difficulties in these multiple developmental areas can lead to subsequent problems during childhood and adulthood which are manifested as psychopathology, physical health problems, relationship difficulties, lower educational attainment and difficulty in staying in employment (van der Kolk et al., 2005).

Consistent with this idea, one study examined 400 treatment seeking trauma exposed individuals and 128 community residents (Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997). The study found that survivors of childhood interpersonal trauma experienced difficulties relating to affect regulation, self-perception, attention and memory, interpersonal difficulties, somatic symptoms and systems of meaning (Roth et al., 1997). More recently, Cloitre et al. (2009) examined the association between cumulative traumas and symptom complexity (number of symptoms) in both child and adult clinical samples. In the adult sample, the results revealed that cumulative trauma during childhood but not adulthood was associated with higher levels of symptom complexity. Within the child sample, cumulative trauma was also associated with increased symptom complexity. It has been suggested that complex trauma in childhood which occurs over a long period of time is associated with increased symptom complexity due to the negative impact that it can have on biological development as well as the ability to integrate sensory, emotional and cognitive information (van der Kolk et al., 2005). Consistent with this idea, De Bellis (2001) described childhood trauma as a complex developmental disorder which is produced by the environment. Furthermore, it is possible that disruption in one developmental stage can have a negative impact on subsequent development (van der Kolk et al., 2005). This idea is in line with Cicchetti and Carlson's (1989) hierarchical theory of psychological and biological development which postulates that each stage of

development is dependent on the previous stage of development being completed successfully. As previously discussed, CSA is often repeated over long periods of time and often co-occurs alongside other types of maltreatment (Gold, 2000). Based on the above evidence it is possible that CSA survivors who have experienced multiple types of abuse/trauma over long periods of time have multiple areas of development which have been disrupted. This may also have a knock on effect on further development and is subsequently manifested as poor functioning and psychopathology throughout the life course (Cloitre et al., 2012; van der Kolk et al., 2005).

1.6.2 Attachment theory

Another theory which may explain some of the relationship difficulties and emotional dysregulation as well as subsequent psychopathology among CSA survivors is the attachment theory. This theory also relates to the theories of complex trauma and development described above as attachment is one important area of development which can be impacted and can subsequently lead to further psychological adjustment difficulties. It has been posited that children form representations of themselves and others which are based on the early relationship with their primary caregivers (Bowlby, 1982). These representations (also referred to as internal working models) become internalised and determine whether the individual feels worthy of love and protection (Bowlby, 1982). Bartholomew and Horowitz, (1991) proposed a four category model of attachment which consists of secure attachment (feeling valued and worthy of love and affection and the view that care givers are trustworthy and dependable), preoccupied (feeling unloved, rejected while wanting to be accepted, with a view of others as unresponsive and untrustworthy), fearful avoidant (desiring social contact but with a view of others as untrustworthy and expectations of rejection) and dismissing avoidant (feeling positive about the self and viewing others as untrustworthy). A dysfunctional family environment in

which CSA is likely to occur, can increase the risk of the child developing an insecure attachment style (Elklit, 2009). Studies examining attachment orientations in samples of maltreated children have provided empirical evidence supporting this idea (Carlson, Cicchetti, Barnett, & Braunwald, 1989; Elklit, 2009). For example, Elklit (2009) estimated that only 10% of CSA survivors had a secure attachment style. This negative association between CSA and secure attachment has been evidenced in both clinical and community studies (Baer & Martinez, 2006; Fergusson, Horwood, & Lynskey, 1996).

An insecure attachment orientation in childhood has consistently been found to increase risk of experiencing poor psychological health in adulthood (e.g. Bartholamew, Kwong, & Hart, 2001). Specifically, research has shown that insecure attachment is associated with paranoia (Pickering, Simpson, & Bentall, 2008) and depression (Burnette, Davis, Green, Worthington, & Bradfield, 2009). The relationship between attachment style and psychological problems has also been evidenced specifically in samples of CSA survivors (Cantón-Cortés, Cortés, & Cantón, 2015). Moreover, insecure attachment can disrupt the development of interpersonal skills (Anders & Tucker, 2000) and affect regulation (Brennan & Shaver, 1995) which can lead to among other difficulties relationship problems and poor emotional recognition and regulation in adulthood. Attachment plays a central role in the development of interpersonal skills (Bowlby, 1982; Collins & Read, 1994). It has been argued that attachment representations impact how an individual behaves within all close relationships (Bowlby, 1982). Therefore, children who have experienced maltreatment and thus have insecure attachment patterns may experience difficulties in this area. Consistent with this idea, research has shown that children who have experienced maltreatment and have an insecure attachment style view others as untrustworthy and unreliable (Cicchetti & Toth, 2005). These difficulties in childhood are often carried through to adulthood. Indeed, relationships during adolescence

and adulthood have similar characteristics to the child's relationship with their early caregiver (Wekerle & Wolfe, 1999). Research has shown that insecure attachment styles in childhood can predict problematic parenting, peer relationships and romantic relationships (Bartholomew & Shaver, 1998; Kim, Trickett, & Putnam, 2011). Furthermore, interpersonal problems are common among CSA survivors (DiLillo, 2001) with survivors reporting an increased risk of experiencing sexual and marital difficulties (Levenkron & Levenkron, 2007).

Additionally, secure attachment plays a key role in developing the ability to identify and regulate emotions (Cicchetti & Toth, 1995). This also relates to the developmental theories of complex trauma (Cloitre et al., 2012; van der Kolk et al., 2005) which were explored previously. Secure attachment orientation has been associated with regulation of negative emotions, and this in turn can act to reduce anxiety associated with the experience of negative events (Brennan & Shaver, 1995). On the other hand, insecure attachment orientations are associated with maladaptive regulation. For example, avoidance or an excessive focus on negative emotions (Morley & Moran, 2011). Worryingly, the relationship between maltreatment and poor emotional recognition and expression has been evidenced even within the first several months of life (Camras, Sachs-Alter, & Ribordy, 1996). Moreover, early affect regulation has been found to be associated with increased psychological distress in adulthood and the development and maintenance of numerous psychological conditions including eating disorders, depressive disorders, personality disorders, drug and alcohol problems and psychosomatic disorders (Dvir, Ford, Hill, & Frazier, 2014). Taken together the above literature suggests that CSA survivors have an increased risk of developing an insecure attachment orientation. This is associated with both interpersonal difficulties and affect deregulation which can result in poor psychological health in adulthood.

1.6.3 Traumagenic dynamics model of CSA

Finkelhor and Browne's (1985) traumagenic dynamics theory postulates that CSA is associated with four dynamics (traumatic sexualisation, betrayal, powerlessness and stigma). It is thought that difficulties in these four areas can explain the range of short and long term negative outcomes associated with the experience of sexual abuse in childhood. Each dynamic can impact the individual's perception and interpretation of the abuse and can influence their cognitive and emotional view of the self, others and the world. These perceptions and interpretations in turn influence future behaviour (Browne & Finkelhor, 1986). The first dynamic, traumatic sexualisation, describes dysfunctional feelings and attitudes towards sex, including confusing feelings relating to one's sexual self-concept. This dynamic is thought to develop as a result of exposure to inappropriate sexual activities. In addition, the victim's confusion may relate to conflicting feelings about the abuse, for example, negative sexual experiences may also be associated with positive experiences such as gifts/attention which are used to groom the victim (Finkelhor & Browne, 1985). Consistent with the dynamic of traumatic sexualisation studies have shown that CSA is associated with increased risky sexual behaviour (Arriola et al., 2005; Fergusson et al., 2013) as well as low self-esteem in relation to sexual relationships (Cantón-Cortés et al., 2013).

The second dynamic in this model is betrayal. This dynamic describes the feelings that the survivor can have towards the trusted adult who either perpetrated the abuse or who failed to protect them from the abuse. Feelings of betrayal can be greater if the victim is not believed when they disclose their experience of sexual abuse (Finkelhor & Browne, 1985). Betrayal can lead to distrust of others even if attachment orientation has previously been secure (Finkelhor & Browne, 1985). These feelings of betrayal have been found to be related to specific long-

term difficulties such as interpersonal relationship difficulties, decreased self-esteem, depression and an increased risk of experiencing re-victimisation (Cantón-Cortés, et al., 2013). The third dynamic within this model, powerlessness, is thought to be related to the victim's body (often repeatedly) being violated against their wishes and having attempts to stop the abuse ignored or disregarded (Finkelhor & Browne, 1985). The child learns that they have no control over their own body, this can lead to a distorted sense of the self and view of others and the world, as well as low levels of self-efficacy (Coffey, Leitenberg, Henning, Turner, & Bennett, 1996). Again, this dynamic is thought to be related to long term difficulties such as, increased distress (Coffey et al., 1996), anxiety and depression (Cantón-Cortés, et al., 2013). The final dynamic within Finkelhor and Browne's (1985) model is stigmatization/self-blame. It has been postulated that the stigma surrounding the experience of CSA impacts the development of the child's image of themselves, and is associated with increased feelings of shame and guilt. These messages of stigma may have been explicitly displayed by the perpetrator (Finkelhor & Browne, 1985). For example, the perpetrator may have told the victim to keep the abuse a secret and blamed the child. However, these feelings of guilt and shame may also be related to the high level of secrecy and stigma surrounding CSA (Finkelhor & Browne, 1985). These feelings can lead to the development and maintenance of psychological conditions. Indeed, there are a large number of studies showing that shame predicts negative psychological outcomes including general distress (Coffey et al., 1996), sexual disorders, dating aggression (Feiring, Simon, & Cleland, 2009) and PTSD (Feiring, Taska, & Lewis, 2002). In summary, this model suggests that it is not the experience of CSA which leads directly to the broad range of associated psychological difficulties but the development four dynamics: traumatic sexualisation, betrayal, powerlessness and stigmatization impact how the individual views themselves and others and this is subsequently manifested as psychopathology (Finkelhor & Browne, 1985).

1.6.4 Biological theories

In addition to interrupting psychological development (as described above), there is also evidence demonstrating that childhood maltreatment can impact brain neuroplasticity and structure (Perry, 2009; Teicher et al., 2004). Again, this also could be related to the developmental theories described above. It has been suggested that modifications occur in specific areas of the brain in order to facilitate survival and reproduction in an unsafe world, thus psychopathology reflects evolutionary modifications in behaviour, thoughts, and mood (Rutter, 2012). Some of the areas of the brain which have been found to be affected by the experience of maltreatment include the neurotransmitter and neuroendocrine systems, including the hypothalamic-pituitary-adrenal (HPA) axis, (which controls reactions to stress and regulates many bodily processes; van der Kolk, 2003), the visual cortex (which is involved in facial recognition and processing; Heim, Mayberg, Mletzko, Nemeroff, & Pruessner, 2013), the hippocampus (which plays a role in declarative memory; Vythilingam et al., 2002) and the somatosensory cortex (which is involved in the processing and experiencing tactile sensations from the genitals; Heim et al., 2013). Studies have also demonstrated that brain modifications have been found in samples of CSA survivors and it has been suggested that individuals who have experienced CSA have brains which are significantly different to individuals who have not experienced CSA in terms of neurological and neuro-cognitive functions (De Bellis, Spratt, & Hooper, 2011).

It could be argued that the changes in the brain occurred before the maltreatment or early life stress occurred. However, there is strong evidence suggesting that the trauma/stress causes the changes in the brain (Teicher & Samson, 2016). Indeed, results from animal studies have

revealed similar brain modifications in randomly selected animals who have experienced induced stress (Teicher, Anderson, & Polcari, 2012) and longitudinal studies have supported the idea that the stress occurs before the structural alterations (Whittle et al., 2013). Moreover, there have been studies which have supported a causal relationship by demonstrating a graded relationship between duration (in years) of childhood maltreatment and a decrease on hippocampal volume in a sample of adult survivors (Bremner et al., 1997). Although there is strong evidence demonstrating the relationship between childhood maltreatment and brain alterations, the evidence relating the brain alterations to psychopathology is said to be more complicated (Teicher, Samson, Anderson, & Ohashi, 2016). A number of studies have demonstrated the association between brain alterations (for example reduced hippocampal volumes or enhanced amygdala response), and psychopathology in trauma samples. For example, one study suggested that reduced hippocampal volume was implicated in the development of depression (Cole, Costafreda, McGuffin, & Fu, 2011). However, recent neuroimaging studies have evidenced that these findings are also present in individuals who have been maltreated but remain resilient. Teicher et al., (2016) reviewed studies examining the relationship between psychopathology and brain changes. The authors concluded that the changes in the brain may play an important role in psychopathology but it was suggested that there may be further compensatory changes in other regions in resilient individuals. Further, it was argued that future studies should focus on the similarities evidenced among both resilient and non-resilient individuals (Teicher et al., 2016). Taken together, research has consistently found a link between childhood maltreatment and alterations in brain development (Perry, 2009; Teicher et al., 2004) and it has been suggested that the relationship is causal in nature (Teicher et al., 2012). Although it has been suggested that the alterations in brain development could explain the development of psychopathology, this relationship is not well understood and further research is warranted (Teicher et al., 2016).

1.7 Psychological and treatment outcomes among trauma survivors

As previously stated, the current thesis will focus on increasing the understanding of psychological outcomes (specifically patterns of co-occurring psychological disorders) and treatment outcomes (specifically time spent in treatment and PTSD treatment response). Within the following section, an overview of the literature relating patterns of co-occurring Axis I disorders, length of time spent in treatment and PTSD treatment response trajectories will be provided.

1.7.1 Psychopathology (Co-occurring disorders)

The literature discussed above has evidenced that CSA is a strong risk factor for experiencing a host of psychological disorders (Chou, 2012; Cutajar et al., 2010; Fergusson et al., 2013; Maniglio, 2009; Turner, et al., 2017). Additionally, there is strong evidence suggesting that CSA is associated with meeting the criteria for multiple disorders at the same time (Trickett et al., 2011). PTSD is one of the most commonly experienced disorders among CSA survivors (Paolucci et al., 2001) and research in other trauma populations have found that between 62% and 92% of individuals with PTSD also meet the criteria for another disorder, such as depressive disorders, somatic disorders, anxiety disorders and substance use disorders (Brady, Killeen, Saladin, Dansky, & Becker, 1994; Breslau, Davis Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Meeting the criteria for multiple disorders has been found to have an increased negative impact on functioning. For example, individuals with PTSD and depression or anxiety have been found to have an increased risk of having suicidal thoughts (Galatzer-Levy, Nickerson, Litz, & Marmar 2013; Sareen, Cox, Clara,

& Asmundson, 2005). Comorbidity is also associated with an overall decreased quality of life and poor physical health (Ikin, Creamer, Sim, & McKenzie, 2010). Based on the evidence described above, it could be suggested that it is appropriate to study co-occurring disorders (as opposed to focusing on one single disorder) among CSA survivors. In addition, increasing our understanding of co-occurring disorders could inform assessments and interventions as well as identifying individuals who may be at a higher risk of having increased negative outcomes.

It has been argued that many of the studies to date examining PTSD and co-occurring disorders have relied heavily on variable level approaches (examining relationships between the variables) which often assumes homogeneity within a population (Contractor et al., 2015). Given that there is substantial heterogeneity among CSA survivors in terms of psychological outcomes (Kendall-Tackett et al., 1993) it could be argued that this method may not be appropriate. There is a growing body of literature which has suggested that person centred analytic techniques such as latent class analysis (LCA; Muthén & Muthén, 2000) and latent profile analysis (LPA; Muthén & Muthén, 2000) which aim to identify hidden subgroups within a population (McCuthchen, 1987), may be a useful way to examine multiple disorders among trauma survivors (Au, Dickstein, Comer, Salters-Pedneault, & Litz, 2013; Contractor et al., 2015; Contractor, Roley-Roberts, Lagdon, & Armour, 2017). There have been a number of recent studies in the trauma literature which have used these methods to identify subgroups of individuals based on their severity of PTSD and other co-occurring disorders (Armour et al., 2015; Au et al., 2013; Cao et al., 2015; Contractor et al., 2015; 2017; Lai, Kelley, Harrison, Thompson, & Self-Brown, 2015). These studies have all revealed three or four subgroups and the majority have found that subgroups which differ in terms of disorder severity as opposed to disorder type (e.g. Au et al., 2013; Contractor et al., 2015). For example, Au et al. (2013) found four subgroups (low symptoms, low-moderate symptoms, high to moderate symptoms

and severe symptoms) with different severity levels of PTSD and depression among sexual assault survivors. Similarly, Contractor et al. (2015) found three subgroups (mild, moderate and severe) of PTSD, depression and anxiety symptoms in a sample of trauma exposed soldiers. In contrast, other studies have suggested that there are subgroups which differ in terms of disorder/symptom type and severity. For example, Cao et al. (2015) found four classes of PTSD and depression symptomology among earthquake survivors; Class 1 was characterised by low levels of symptoms on both disorders, Class 2 was characterised by high symptoms on both disorders, Class 3 was characterised by high levels of PTSD and Class 4 was characterised by high levels of depression.

Identifying multiple subgroups of co-occurring disorders could inform assessment and lead to more individualised interventions (Contractor et al., 2017). However, to date there are no studies which have used these methods in samples of treatment seeking CSA survivors. This gap in the literature will be addressed within this thesis. Furthermore, the study will attempt to extend on previous studies which have largely focused on PTSD, depression and or anxiety, by including somatoform disorder. CSA has been found to increase the risk of experiencing somatic and medically unexplained symptoms (Maniglio, 2009). Further, somatic symptoms have been found to co-occur with PTSD, depression and anxiety (McFarlane, Atchison, Rafalowicz, & Papay, 1994; Thieme, Turk, & Flor, 2004). Chapter 3 will provide a comprehensive overview of the literature relating to co-occurring disorders among trauma survivors, as well as exploring theories of comorbid disorders and examining studies which have used person centred methods to identify subgroups of individuals based on the type and severity of disorder. The study in Chapter 3 will attempt to increase understanding of psychopathology among treatment seeking CSA survivors. As previously demonstrated CSA survivors are a population characterised by substantial heterogeneity in terms of

psychopathology. Therefore using methods which can identify subgroups of disorder type and severity is essential. The study in Chapter 3 will use novel methods (LPA) to examine empirically derived patterns of co-occurring Axis 1 disorders (specifically PTSD, major depressive disorder; MDD, anxiety, dysthymia and somatoform disorder).

1.7.2 Length of time spent in treatment

The second outcome which will be explored within the current thesis is length of time spent in treatment. Given the wide range of psychological difficulties in adulthood which have been found to be associated with the experience of sexual abuse in childhood (e.g. Maniglio, 2009) it is hardly surprising that some CSA survivors may require treatment to reduce their symptoms. Understanding the variation in treatment outcomes among CSA survivors has important implications for assessment and treatment planning. The first treatment outcome which the current thesis will examine is length of time spent in treatment. Despite evidence that a number of psychological treatments can reduce trauma associated symptoms in CSA survivors (Elklit, 2015; Taylor & Harvey, 2010) premature treatment attrition remains a problem within this population (Chasson, Mychalszyn, Vincent, & Harris, 2013; Harte, Hamilton, & Meston, 2013). Studies have suggested that leaving treatment early may decrease the positive impact and leave unresolved trauma related symptoms (Armbruster & Kazdin, 1994). Additionally, individuals who have dropped out of treatment and have unresolved symptoms may be more likely to seek further treatment (Armbruster & Kazdin, 1994) and have higher levels of healthcare utilisation (Tuerk et al., 2013) thus increasing the burden on society. There have been a number of studies which have examined predictors of treatment dropout within this population. Factors which have been implicated in treatment dropout include

younger age, low economic status, poor psychological health and positive coping strategies (Cloitre, Chase Stovall-McClough, Miranda, & Chemtob, 2004; Harte et al., 2013; Murphy et al., 2013). There have been mixed findings in relation to abuse characteristics such as type, duration and severity of the abuse (Chasson et al., 2013; Lau & Kristensen, 2007; McDonagh et al., 2005). A more detailed account of factors associated with time spent in treatment as well as factors which have not been previously studied will be included in a later section of this chapter. Although there have been numerous studies examining predictors of attrition in CSA survivors there are no known studies which have examined multiple drop out times. It has been argued different factors could affect dropout at different stages (Gutner, Gallagher, Baker, Sloan, & Resnick, 2016). Understanding the factors which predict time spent in treatment could potentially lead to the identification of patients who have an increased risk of premature treatment dropout. Further, it may also inform treatment planning as modifications could be made to support individuals to stay in treatment where appropriate. In Chapter 5, an in depth review of the literature relating to length of time spent in treatment among CSA survivors will be provided. The study in Chapter 5 will attempt to increase understanding of treatment outcomes by examining rates of treatment dropout at different stages of treatment as well as examining predictors of length of time spent in treatment.

1.7.3 PTSD treatment response trajectories

In addition to examining patterns of co-occurring disorders and length of time in treatment, this thesis also aims to examine how PTSD changes over the course of treatment. As previously mentioned, research has estimated that between 37% and 43% of CSA survivors meet the criteria for PTSD (Paolucci et al., 2001). Understanding how PTSD changes over the course of

treatment is vital for evaluating the effectiveness of the treatment. Although there is a wealth of literature examining PTSD treatment response among CSA survivors, many studies have evaluated treatment by examining changes in mean scores over time (Taylor & Harvey, 2010). This method however, does not take the occurrence of differential treatment response patterns into account.

There has been a recent increase in studies using analytic techniques such as latent growth mixture modelling (LGMM) and latent growth class analysis (LGCA) to examine multiple PTSD trajectories (e.g. Stein, Dickstein, Schuster, Litz, & Resick, 2012). These methods are similar to the latent variable modelling methods described above (LCA, LPA) but they identify hidden subgroups based on how the individual changes over time. Stein et al. (2012), identified two distinct trajectories in a sample of survivors of interpersonal violence attending cognitive behaviour therapy. The largest group (87%) was characterised by PTSD symptoms which decreased over time and the second group (13%) was characterised by symptoms which did not improve over time (Stein et al., 2012). These results indicate that distinct subgroups relating to PTSD treatment response do exist. Another recent study (Steine et al., 2017^a), examined PTSD trajectories in a sample of 138 adult CSA survivors (not specifically attending treatment). The study found two trajectories, one (54.9%) which was characterised by mild PTSD symptoms which decreased over time and one (45.1%) which was characterised by severe symptoms which decreased slightly over time. These findings suggest that there are distinct subgroups which differ in terms of levels of PTSD severity and rates of change over time even when the individuals are not attending treatment. To date, there are no known studies examining PTSD treatment response trajectories among CSA survivors. Understanding whether there are multiple trajectories or whether all individuals follow the same trajectory has important implications for treatment planning as individuals who were at risk of not responding

to treatment could potentially be identified at an early stage. Further, understanding predictors of the trajectories could potentially identify factors associated with PTSD recovery and treatment resistance. The study in Chapter 6 will provide an in depth examination of the literature relating to PTSD treatment response trajectories and will attempt to increase understanding of treatment outcomes by examining whether distinct trajectories based on how PTSD changes over the course of treatment are present within the current population.

1.8 Risk and protective factors

In addition to exploring patterns of co-occurring disorders, time spent in treatment and PTSD treatment response trajectories, this thesis aims to explore factors which can potentially explain some of the variation found in psychopathology and treatment outcomes among CSA survivors. Understanding the factors explaining this variation has important theoretical and clinical implications which could ultimately improve these outcomes. Identifying protective factors (associated with promoting positive outcomes) and risk factors (associated with an increased risk for experiencing negative outcomes) could inform treatment planning. It is possible that some of the identified factors can be modified in order to reduce the negative outcomes and promote positive outcomes (Spaccarelli & Kim, 1995). Although protective and risk factors have been widely studied in trauma populations (mainly within veteran samples) it has recently been argued that there is a lack of studies examining risk and protective factors specifically in samples of CSA survivors (Steine et al., 2017^a). A number of models which have attempted improve understanding of the variation in outcomes among CSA survivors have suggested that coping style and social support are two of the factors which play a key role (Finkelhor & Browne, 1985; Spaccarelli, 1994). Spaccarelli (1994) suggested that coping style,

environmental factors, cognitive appraisal style, and developmental factors can influence adjustment among CSA survivors. Similarly, Finkelhor and Browne, (1985) suggested that a lack of support could lead to increased levels of stigmatization/self-blame and betrayal which are in turn associated with more severe psychological difficulties. The current thesis will examine the roles of coping style and social support (among other factors) as predictors of the three outcomes examined. Social support and coping will be the focus within this thesis as they could be potentially modified or targeted during treatment. However, the role of other factors such as abuse characteristics and demographic characteristics will also be examined. The following section will provide an overview of the extant literature examining the roles of social support, coping, trauma characteristics and demographic characteristics in explaining variation in outcomes among trauma exposed individuals.

1.8.1 Social support

Social support has been defined as material and psychological resources which increase one's capacity to cope with stress (Cohen, 2004). Notably, childhood maltreatment has been found to be associated with smaller support networks, and the perception that little support is available (Harmer, Sanderson, & Mertin, 1999). Further, CSA may interrupt secure attachment orientations and interpersonal difficulties which may in turn lead to difficulties in accessing social support (Bowlby, 1982; Collins & Read, 1994). Thus childhood maltreatment may increase the risk of having less positive social support however this is not always the case and survivors of CSA who do experience positive social support have been found to have better outcomes (Spaccarelli & Kim, 1995). High levels of social support have been consistently found to be associated with positive mental health (Cohen & Wills, 1985). Within trauma samples social support has consistently been found to be protective against psychopathology.

Indeed, two meta-analyses concluded that low social support was the strongest predictor of the development of PTSD following a traumatic event (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Moreover, it has been found to be associated with having a decreased risk of PTSD development (Elklit, 2015; Schumm, Briggs-Phillips, & Hobfoll, 2006; Tremblay, Hebert, & Piche, 1999) and experiencing sexual re-victimisation (Mason et al., 2009) in samples of CSA survivors. Consistent with this, a literature review examining resilience factors among CSA survivors concluded that interpersonal features including family support and stability, positive peer relationships, social support and a sense of a community predicted resilience (Marriott, Hamilton-Giachritsis, & Harrop, 2014). The authors suggested that resilience could be increased through the use of health promotion, social policies and programmes aimed to improve support and provide a sense of community (Marriott et al., 2014). In addition to being associated with less severe psychopathology, social support has also been found to be associated with recovery and positive treatment response. For example, one study found that social support was associated with post trauma recovery in veterans (Karstoft, Armour, Elklit, & Solomon, 2013). Additionally, Steine et al. (2017^a) examined predictors of longitudinal PTSD classes among survivors of CSA found that individuals within the high PTSD class had lower levels of social support. In relation to time spent in treatment there have been no known studies which have examined social support as a predictor of treatment dropout among CSA survivors. As social support has been found to explain variation in psychological outcomes and recovery among CSA survivors it is plausible that it may also predict time spent in treatment. Moreover, the role of social support as a predictor Axis I disorders profiles and PTSD treatment response trajectories among CSA survivors has not been specifically examined. The studies within this thesis will address these gaps within the literature.

There are a number of explanations for the negative association between social support and psychopathology. The main effects model suggests that social support has a positive impact on wellbeing which is independent of the situation as it is associated with stability, self-worth, positive moods, and decreased negative experiences (Cohen & Wills, 1985). It has also been proposed that social support protects individuals who are experiencing stress by buffering the effect of the stressful event. It is thought that the perception that others will provide support may increase the individual's ability to cope and reduce the perceived importance of the event therefore decreasing the impact it can have on psychological wellbeing (Cohen & Wills, 1985). In contrast to the theories which suggest that social support has a positive impact on mental health and has a buffering effect against stress, other studies have suggested that the symptoms associated with trauma predict poorer social relationships (Campbell & Renshaw, 2013). For example, one study suggested that the PTSD symptoms avoidance and numbing had a negative impact on relationship satisfaction (Campbell & Renshaw, 2013). Another recent study examined both of these theories in a sample of trauma survivors (n=501) and confirmed a strong association between PTSD and relationship satisfaction. However, the results suggested that relationship satisfaction was more likely to contribute to PTSD rather than vice versa (Freedman, Gilad, Ankri, Roziner, & Shalev, 2015).

1.8.2 Coping style

Lazarus and Folkman (1984) defined coping as cognitive and behavioural efforts which are used to manage internal and external stressors. One model of coping describes two coping methods: emotion focused coping and problem focused coping. Emotion focused coping aims to reduce and manage internal psychological distress which has been caused by the trauma as

opposed to directly addressing the problem. This can include the use of strategies such as avoiding thinking about the trauma, distraction or reappraisal (Lazarus & Folkman, 1984). On the other hand, problem focused coping aims to reduce external stress by addressing the problem in a direct manner by trying to change the situation (Lazarus & Folkman, 1984). Other coping styles which have been conceptualised include avoidant coping (for example, self-distraction or substance abuse) and detached coping (for example, feelings of disconnection in relation to the trauma; Roger, Jarvis, & Najarian, 1993). To date, there has been consistent evidence demonstrating that coping can explain variance in outcomes of individuals who have experienced trauma (e.g. Elklit, 2015; Karstoft, Armour, Elklit, & Solomon, 2015; Kuyken & Brewin, 1999; Sigmon, Greene, Rohan, & Nichols, 1997). Research has suggested that both emotional and avoidant coping styles are associated with increased and long term PTSD in trauma populations (Karstoft et al., 2015). Within samples of CSA survivors, emotional coping has been found to be associated with increased psychopathology (Elklit, 2015; Sigmon et al., 1997). In contrast, problem focused coping has been found to be associated with less psychological distress in adult CSA survivors (Coffey et al., 1996). Shapiro and Levendosky (1999) suggested that coping may affect functioning in multiple ways. Firstly, it may play a role in how an individual deals with the stressor and secondly the coping method used affects subsequent coping and functioning. For example, avoidance and emotional coping strategies may be adaptive at the time the abuse is occurring, as the individual may be in a state of helplessness. However this coping mechanism later becomes maladaptive (Lazarus & Folkman, 1984). On the other hand trauma survivors who are able to utilise more positive coping strategies such as rational or problem based coping are more likely to effectively manage their negative emotions relating to the abuse and subsequently experience lower levels of long-term psychological distress (Shapiro & Levendosky, 1999).

The evidence above suggests that emotional and avoidant coping are associated with negative outcomes whereas problem focused (or rational) coping are associated with more positive long term outcomes. There are no known studies which have examined coping style in relation to Axis I disorder profiles in CSA survivors. In relation to treatment attrition, there has been one study which has examined the role of coping among CSA survivors. The study found that positive coping strategies predicted treatment dropout in female CSA survivors (Harte et al., 2013). The authors argued that the participants may be less in need of treatment as they already have positive coping strategies to deal with the consequences related to the trauma. Finally, in relation to treatment response there have been a number of studies which have examined coping style as predictors of longitudinal trajectories. Recently, Karstoft et al. (2015) found that veterans who utilised a problem solving coping style had decreased odds of membership in both the chronic and worsening PTSD trajectories. However, this has not yet been examined among CSA survivors. Due to the lack of studies in this area further research is needed to examine the role of coping style in predicting Axis I disorder profiles, time spent in treatment and PTSD treatment response within this population.

1.8.3 Trauma characteristics

There has also been evidence demonstrating that abuse characteristics (such as duration, severity and type of abuse and the victim's relationship with the perpetrator) can explain some of the variation in long term psychological outcomes. Notably, there have been some inconsistencies in the literature. A number of studies have suggested that more severe (for example the use of threats or violence) and chronic sexual abuse is associated with worse outcomes and is associated specifically with an increased risk of depression, PTSD, panic disorders and suicidality (Kendall-Tackett et al., 1993; Putnam, 2003). One example is a

prospective study which found that individuals who had experienced penetrative abuse had higher levels of PTSD symptomology at age 30 (Fergusson et al., 2013). Contrary to this, one meta-analysis suggested that abuse factors were not significantly related to PTSD severity (Paolucci et al., 2001). The inconsistencies noted in the literature could be due to the definitions of the types of abuse and what type of abuse is categorised as ‘severe’ abuse (Kendall-Tackett et al., 1993). In addition to the studies which have examined the role of abuse severity and duration, other studies have examined the number of perpetrators. The findings have suggested that children abused by multiple perpetrators are at an increased risk of experiencing negative outcomes (Cutajar et al., 2010; Steel, Sanna, Hammond, Whipple, & Cross, 2004). For example, one study found that children who were sexually abused by more than one perpetrator were more likely to attend mental health services in adulthood (Cutajar et al., 2010). Research has also highlighted that experiencing multiple types of trauma can increase the negative effects. It is widely accepted that CSA commonly co-occurs with other forms of abuse and neglect and a growing body of literature has highlighted that exposure to multiple types of trauma increases risk of experiencing more severe psychopathology when compared to the experience of only one type of trauma (Finkelhor, Ormrod, & Turner, 2007; Shevlin, Houston, Dorahy, & Adamson, 2008). Moreover there is evidence that this relationship is graded, meaning that as the number of adverse childhood experiences increase the levels of psychological and physical difficulties increase (Chapman et al., 2004). In terms of predicting multiple symptoms/disorders, a recent study found that more severe abuse predicted more increased symptom complexity in a sample of adult survivors of sexual abuse (Steine et al., 2017^b). When compared to experiencing a single traumatic event, cumulative traumas have been found to be associated with the experience of complex PTSD (Cloitre et al., 2009).

In relation to treatment attrition, there have been a number of studies which have examined the role of trauma related factors. The results however have been mixed, thus further investigations are required. One study found that less severe abuse was associated with early treatment attrition (Chasson et al., 2013) and others have suggested that more severe abuse increases risk of premature treatment attrition (Lau & Kristensen, 2007; McDonagh et al., 2005). Finally, there have also been a number of studies which have examined the role of abuse characteristics in predicting PTSD trajectories. One study which examined abuse characteristics in a sample of maltreated children suggested that an increased number of maltreatment types increased the odds of being in the trajectory characterised by PTSD which did not improve over time. (Miller-Graff & Howell, 2015). Another found that other types of childhood trauma in addition to the experience of CSA and CSA involving threats or violence increased the likelihood of membership in the high PTSD trajectory (Steine et al., 2017^a). On the basis of this evidence it appears that more severe and cumulative abuse predicts more severe and chronic PTSD. This will also be explored within the current sample.

1.8.4 Demographic Characteristics

In terms of demographic characteristics, there have been a number of inconsistencies within the literature. For example, one study indicated that female childhood trauma survivors are at a lower risk of experiencing psychopathology when compared to males (DuMont, Widom, & Czaja, 2007). It is however possible that this result could be explained by evidence suggesting that males delay help-seeking and are more likely to attend treatment only when symptoms are more severe (Galdas, Cheater, & Marshall, 2005). Further, the relationship between gender and psychological outcomes may be further complicated by differences in disclosure rates. For

example, there is evidence to suggest that males are less likely to recognise and disclose CSA (Holmes & Slap, 1998; Welch & Mason, 2007). If this is the case, it is possible that males may disclose only more severe abuse and this this may explain the results which suggest that males appear to be at an increased risk of psychopathology. On the other hand, there is also evidence suggesting that males have a lower risk of experiencing negative outcomes (e.g. Little & Hamby, 1999). Additionally, there are studies suggesting that gender is not associated with symptom severity. For example, Contractor et al. (2015) revealed that gender did not significantly predict PTSD, depression and anxiety severity in a sample of trauma exposed soldiers. The inconsistencies in the literature suggest that further studies are required to increase understanding of the gender differences within this population.

In relation to education, the literature has largely indicated that lower levels of education predict increased negative outcomes among trauma exposed individuals (Contractor et al., 2015; Pedersen et al., 2008). Finally, there have also been mixed results relating to current age and psychological and treatment outcomes. For example, one study suggested that age was not predictive of PTSD, anxiety and depression (Contractor et al., 2015). In contrast, some studies have revealed that younger age predicts more severe PTSD (Naifeh, Richardson, Del Ben, & Elhai, 2010) and premature treatment dropout (Cloitre et al., 2004). Taken together, research has suggested that demographic characteristics may influence outcomes among trauma survivors, however there have been some mixed results. The roles of age, gender and education will be examined in the current thesis.

1.9 Summary

In summary, CSA affects a significant number of children worldwide (UNICEF, 2014) and studies have consistently shown that it is a robust predictor of a range of psychological and physical health problems (Chen et al., 2010; Fergusson et al., 2013; Kendall-Tackett et al., 1993; Paolucci et al., 2001). The evidence points to substantial heterogeneity in relation to both psychological and treatment outcomes among trauma survivors (Kendall-Tackett et al., 1993). Identifying subgroups of co-occurring disorders (depressive disorders, anxiety, PTSD and somatoform disorder) may improve understanding of post trauma psychopathology and could inform assessments and interventions. However, to date there are no studies which have examined this in samples of CSA survivors. Understanding time in treatment/treatment dropout also has important implications for treatment planning. Due to the inconsistencies in the literature further research in this area is warranted. Finally, identifying multiple PTSD treatment response trajectories within this population could lead to treatment which is more tailored to the individual thus leading to better outcomes for survivors. However, this has not yet been explored within this trauma population. Given the high prevalence rates and devastating consequences associated with CSA understanding the factors which could potentially reduce distress within this population is vital. There is evidence suggesting that factors such as social support and coping styles, can explain heterogeneity in outcomes among CSA survivors. The role of these factors will be examined in relation to Axis I disorder profiles, time spent in treatment and PTSD treatment response trajectories in the current thesis.

1.10 Aims and Objectives

The two overarching aims of the thesis are to (1) increase understanding of psychological and treatment outcomes among CSA survivors and (2) identify factors which can explain variation

in the psychological and treatment outcomes. The aims will be attempted to be met by the following research objectives.

- 1) Identify empirically derived profiles of Axis I disorders
- 2) Identify predictors of Axis I disorder profiles
- 3) Examine rates of length of time spent in treatment
- 4) Identify predictors of length of time spent in treatment
- 5) Identify the changes in PTSD symptomatology over time
- 6) Examine whether all participants follow a similar trajectory in relation to longitudinal PTSD or whether there are multiple trajectories
- 7) Examine predictors of PTSD treatment response trajectories

Chapter 2: Methodology

2.1 Introduction

The focus of the current thesis is to examine psychopathology and treatment outcomes among childhood sexual abuse (CSA) survivors attending psychotherapy. An in depth discussion detailing the rationale and the research aims was provided in Chapter 1. All studies within the current thesis will utilise a data set which has been collected from treatment centres for survivors of sexual abuse in Denmark in collaboration with the European Centre of Psychotraumatology. The current chapter will provide a description of the study participants, the treatment and all measures which will be used throughout this thesis. Following this, descriptive statistics relating to socio-demographic characteristics and abuse characteristics will be presented. An overview of all used analyses and methods relating to the handling of missing data will be provided in each individual chapter.

2.2 Participants

The initial data set had 456 participants. Each study within this thesis will use a subset of the initial dataset (a description of the participants used in each study will be provided in each method section). All participants were CSA survivors attending psychotherapy at one of four government funded treatment centres in Denmark. There were a number of exclusion criteria, these were: presenting under the influence of drugs/alcohol, current psychosis, current personality disorder characterized mainly by perpetrating traits (for example, aggression or causing harm to others), current self-destructive behaviour or being in receipt of treatment elsewhere. All participants who were excluded were referred to the relevant agency for further care where appropriate.

2.3 Procedure

Prevention and detection of CSA as well as the treatment for adult survivors of CSA has recently become a government concern in Denmark. This has led to the opening of a number of treatment centres which provide free psychotherapy for survivors. All centres are funded by the Ministry of social affairs. The data utilised in the current thesis is from four (now three) treatment centres throughout Denmark. The centres are located in the mid north and the south regions of Denmark as well as one in the capital of Denmark. All data used in the study was collected between April 2007 and August 2014. The treatment centres collaborate with the European Centre of Psychotraumatology which is based at the University of Southern Denmark. The use of the data for research has been ethically approved by all relevant university ethics boards in Denmark. As well as informing the literature on sexual abuse outcomes and risk and protective factors the overall research project aims to inform policy and practice with the ultimate goal of improving outcomes for survivors.

Patients attending the treatment centres can self-refer or be referred to treatment by a health professional. Telephone contact was made with the patient before the initial meeting. During the first session the patient was given information about the treatment and has an opportunity to ask questions. The patient was asked if they would fill out a number of questionnaires during the second session. During the second session, a number of questionnaires (see measures section for details) were completed. These assessments were repeated every six months (with the exception of the demographic and the trauma characteristics). Only patients who attended regular therapy sessions received the assessments. The studies within this thesis have used data

collected at the initial assessment (T1), at six months (T2), 12 months (T3), and 18 months (T4). All data was translated from Danish into English and then fully screened and cleaned. Following this, individuals with over 20% of missing data were excluded resulting in an effective sample size of 439.

2.4 Treatment

Individual treatment is conducted at the treatment centre by psychologists under supervision. The treatment is free, sessions are once a week and there are no limits on the number of sessions that the patient can attend. There is no common treatment manual in the centres and individualized treatment plans are based on the scores derived from the Millon Clinical Multiaxial Inventory, Third Edition (MCM-III; Millon, Millon, Davis, & Grossman, 2009). Millon's theory of personality and psychopathology (which was first developed in 1969 but has been revised many times) suggests that psychopathology is due to disruptions in evolutionary processes which aim to enable a person to adapt for survival. It has been postulated that personality style is made up of three evolutionary polar scales: pleasure and pain, the self and others, and active and passive. Individuals who have psychological disorders are thought to be unbalanced on these polar scales (Millon, 1997; Millon et al., 2009). For example, the individual may be excessively reliant on other or the self or may be overly passive. Each personality type also differs in relation to a number of structural and functional attributes. Structural attributes include self-image, temperament and morphologic organisation. These attributes reflect templates including those relating to needs, memories, fears and conflicts, which influence experiences and can change the action and subsequently life experiences (Millon, 1997; Millon et al., 2009). On the other hand, functional attributes include

interpersonal conduct, expressive behaviours and cognitive style, and they reflect processes which occur between the individual and their psychosocial environment (Millon, 1997; Millon et al., 2009). The MCMI (Millon, 1997; Millon et al., 2009) is based on Millon's theory of personality and psychopathology and it aims to measure the evolutionary polarities, the structural and functional attributes as well as estimating the individuals presenting problem. Personalised psychotherapy is based on this assessment and it assumes that current psychological difficulties are a result of a number of complex and interwoven feedback loops and chains relating to biological, emotional, cognitive, intrapsychic and behavioral processes (Millon & Grossman, 2007). Each of these processes can also be impacted by other internal and external factors and can occur at different times. As opposed to focusing on one treatment modality such as cognitive behavioral therapy (CBT), personalised psychotherapy is tailored to the individual and can encompass a number of different types of interventions such as cognitive, behavioural, and interpersonal therapy depending on the presenting problems of the individual and the personality features which are thought to underlie these problems (Millon, 1997). There was no information regarding individual treatment plans. The lack of treatment fidelity is a limitation of the data as it is possible that the treatment characteristics could influence both the length of time spent in treatment and treatment response. All conclusions drawn from this thesis should be considered in light of this limitation.

2.5 Measures

Within this section a detailed description of each measure which has been used will be provided. As there are a number of differences between studies relating to the measures used (for example, the subscales or composite variables) a brief overview of the measures will also be provided in each empirical chapter.

2.5.1 Demographic characteristics

All participants were asked questions relating to socio-demographic characteristics including age (continuous score measured in years), sex (male=0, female=1), marital status (single, cohabiting, married, widow/widower or divorced), years of education (continuous score measured in years), number of children and employment status (employed, unemployed, retired).

2.5.2 Trauma characteristics

All participants were asked questions about the abuse they experienced. Firstly, questions about the types of sexual abuse experienced were asked. All questions had a yes or no response option. This section included the following types of abuse: sexual talk (such as being spoken to about sexual acts), being questioned about sex, being teased about sexuality, being made to listen to other's sexual experiences, being asked to take part in sexual acts, being made to watch someone expose themselves, being exposed to pornography, being made to expose oneself to others, being kissed in a sexual way, being touched in a sexual way (non-genital), being touched in a sexual way (genital areas), being made to touch the genitals of someone, being made to masturbate or engage in reciprocal masturbation, attempted intercourse genital, oral, or anal intercourse or being threatened/exposed to danger. Any types of abuse which did not fit into these categories were categorised as other. Participants were also asked what age they were at the beginning and the end of the sexual abuse, what age they disclosed the abuse and whether they disclosed the abuse to a teacher, police, therapist, mother, father, sibling, friend or partner.

Participants were asked about their relationship with the perpetrator of the abuse. The list of potential perpetrators included: mother, father, step-parent, sibling, other adult family member, other adult or other. Again, all questions had yes or no response options. Other questions relating to the perpetrator included: the age gap between the victim and the perpetrator, whether the perpetrator was reported to the police, taken to court or convicted, whether the perpetrator admitted the abuse and whether the perpetrator moved away. Finally, participants were asked if they had experienced any traumatic events within the past year and were also asked whether they had experienced other traumatic events. The response options were yes or no. Questions were based on the trauma measure used in the National Comorbidity Survey (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Traumatic events included were: rape, childhood neglect, life threatening accident, witnessed someone being injured or killed, physical assault, childhood physical abuse, threatened with a weapon, held captive or kidnapped, the death of a loved one during childhood or suffering shock due a traumatic event happening to someone you are close to or other.

2.5.3 MCMI-III (Millon, 1997; Millon et al., 2009)

This scale is based on Millon's (1997) theory of personality and psychopathology (described above). The MCMI-III is a self-report assessment scale has 175 items each of which has a true or false response option. It has 28 subscales in total which measure Axis 1 (clinical disorders) and Axis II (personality disorders) disorders which correspond to the DSM-IV-TR (APA, 2000) criteria. There are also a number of modifying and validity scales: disclosure, desirability, and debasement. The psychometric properties of the scale (including the Danish version) have been widely tested and overall the scale has been found to have good reliability.

For example, Craig (1999) found acceptable median correlations across multiple studies ($r=0.78$) and Millon et al. (2009) reported Cronbach's alpha coefficients ranging between 0.66 and 0.95. The scale has also been found to have good reliability (Craig 1999; Rossi, Van den Brande, Tobac, Sloore, & Hauben, 2003). Studies have shown that the scale has good concurrent validity with other clinical scales relating to psychological and personality disorders (Craig 1999). It has however been suggested that although this scale is useful for clinicians it should be used in conjunction with other methods (Rossi et al., 2003). Within the current thesis MCMI-III scores from the initial assessment will be utilised in Chapters 3 and 4. Only the scores for PTSD, major depressive disorder (MDD), dysthymic disorder, somatoform disorder and anxiety were utilised. As all these subscales correspond to DSM-IV nosology, the diagnostic criteria for each of these disorders have been presented below in Tables 2.1, 2.2, 2.3, 2.4, and 2.5. The Cronbach's Alpha values ranged between 0.63 and 0.8. Participants who had scores which did not meet the MCMI-III validity criteria were excluded. Raw scores were converted into base rate scores which can range between 0 and 115. A number of different cut off scores have been used: a score of 75 or over indicates a probable clinical level of the Axis I disorder and a score of 85 or over indicates severe levels of the disorder. Other previous studies (e.g. Hyland et al., 2015) have also used a score of 65 or over to indicate subclinical levels of the disorder. All three of these cut off scores will be utilised in the current thesis.

Table 2.1: DSM-IV-TR diagnostic criteria for Major Depressive Episode and Major Depressive Disorder

-
- 1 Depressed mood most of the day
 - 2 Diminished interest or pleasure in all or most activities
 - 3 Significant unintentional weight loss or gain
 - 4 Insomnia or sleeping too much
 - 5 Agitation or psychomotor retardation noticed by others
 - 6 Fatigue or loss of energy
 - 7 Feelings of worthlessness or excessive guilt
 - 8 Diminished ability to think or concentrate, or indecisiveness
 - 9 Recurrent thoughts of death
-

Note: Major Depressive Disorder requires two or more major depressive episodes, depressed mood and/or loss of interest or pleasure in life activities for at least 2 weeks and at least five of the following symptoms that cause clinically significant impairment in social, work, or other important areas of functioning almost every day. Source: DSM-IV-TR (APA, 2000)

Table 2.2: DSM-IV-TR diagnostic criteria for Dysthymic Disorder

-
- | | |
|----------|---------------------------------------------------|
| 1 | Poor appetite or overeating |
| 2 | Insomnia or sleeping too much |
| 3 | Low energy or fatigue |
| 4 | Low self-esteem |
| 5 | Poor concentration or difficulty making decisions |
| 6 | Feelings of hopelessness |
-

Note: Depressed mood most of the day for more days than not, for at least 2 years, and the presence of two or more of the following symptoms that cause clinically significant impairment in social, work, or other important areas of functioning.

Source: DSM-IV-TR (APA, 2000)

Table 2.3: DSM-IV-TR diagnostic criteria for Somatization disorder

-
- A** A history of many physical complaints beginning before age 30 years that occur over a period of several years and result in treatment being sought or significant impairment in social, occupational, or other important areas of functioning.
- B** Each of the following criteria must have been met, with individual symptoms occurring at any time during the course of the disturbance
1. Four pain symptoms: a history of pain related to at least four different sites or functions (e.g., head, abdomen, back, joints, extremities, chest, rectum, during menstruation, during sexual intercourse, or during urination)
 2. Two gastrointestinal symptoms: a history of at least two gastrointestinal symptoms other than pain (e.g., nausea, bloating, vomiting other than during pregnancy, diarrhea, or intolerance of several different foods)
 3. One sexual symptom: a history of at least one sexual or reproductive symptom other than pain (e.g., sexual indifference, erectile or ejaculatory dysfunction, irregular menses, excessive menstrual bleeding, vomiting throughout pregnancy)
 4. One pseudo neurological symptom: a history of at least one symptom or deficit suggesting a neurological condition not limited to pain (conversion symptoms such as impaired coordination or balance, paralysis or localized weakness, difficulty swallowing or lump in throat, aphonia, urinary retention, hallucinations, loss of touch or pain sensation, double vision, blindness, deafness, seizures; dissociative symptoms such as amnesia; or loss of consciousness other than fainting)
- C** Either 1 or 2:

1. After appropriate investigation, each of the symptoms in Criterion B cannot be fully explained by a known general medical condition or the direct effects of a substance (e.g. a drug of abuse, a medication)
2. When there is a related general medical condition, the physical complaints or resulting social or occupational impairment are in excess of what would be expected from the history, physical examination, or laboratory findings

D The symptoms are not intentionally feigned or produced (as in Factitious Disorder or Malingering).

Source: DSM-IV-TR (APA, 2000)

Table 2.4: DSM-IV-TR diagnostic criteria for generalized anxiety disorder

A	Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance).
B	The person finds it difficult to control the worry.
C	The anxiety and worry are associated with three (or more) of the following six symptoms (with at least some symptoms present for more days than not for the past 6 months). Note: Only one item is required in children. <ol style="list-style-type: none">1. Restlessness or feeling keyed up or on edge2. Being easily fatigued3. Difficulty concentrating or mind going blank4. Irritability5. Muscle tension6. Sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep)
D	The focus of the anxiety and worry is not confined to features of an Axis I disorder, e.g., the anxiety or worry is not about having a Panic Attack (as in Panic Disorder), being embarrassed in public (as in Social Phobia), being contaminated (as in Obsessive-Compulsive Disorder), being away from home or close relatives (as in Separation Anxiety Disorder), gaining weight (as in Anorexia

Nervosa), having multiple physical complaints (as in Somatization Disorder), or having a serious illness (as in Hypochondriasis), and the anxiety and worry do not occur exclusively during Posttraumatic Stress Disorder.

- E The anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- F The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hyperthyroidism) and does not occur exclusively during a Mood Disorder, a Psychotic Disorder, or a Pervasive Developmental Disorder.

Source: DSM-IV-TR (APA, 2000)

Table 2.5: DSM-IV-TR diagnostic criteria for PTSD

-
- A** The person has been exposed to a traumatic event in which both of the following have been present
1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
 2. The person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behavior
- B** The traumatic event is persistently re-experienced in one (or more) of the following ways:
1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. **Note:** In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
 2. Recurrent distressing dreams of the event. **Note:** In children, there may be frightening dreams without recognizable content.
 3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated). **Note:** In young children, trauma-specific reenactment may occur.
 4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma
2. Efforts to avoid activities, places, or people that arouse recollections of the trauma
3. Inability to recall an important aspect of the trauma
4. Markedly diminished interest or participation in significant activities
5. Feeling of detachment or estrangement from others
6. Restricted range of affect (e.g., unable to have loving feelings)
7. Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)

D Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. Difficulty falling or staying asleep
2. Irritability or outbursts of anger
3. Difficulty concentrating
4. Hyper-vigilance
5. Exaggerated startle response

E Duration of the disturbance (symptoms in Criteria B, C, and D) is more than one month.

F The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Source: DSM-IV-TR (APA, 2000)

2.5.4 Crisis Support Scale (CSS; Joseph, Andrews, Williams, & Yule, 1992)

The CSS was initially developed in the form of a semi-structured interview to measure levels of social support following a traumatic event (Joseph et al., 1992). It has since been modified and is used as self-report questionnaire (Joseph et al., 1992). The CSS is a 7 item scale, each of the 7 items are rated on a 7 point Likert scale ranging from 'never' to 'always'. The items are: 1) perceived others as willing to listen 2) contact with people in a similar situation, 4) received sympathy and support, 5) received practical support, 6) experienced being let down by others 7) general satisfaction with social support.

Within this thesis the total score for perceived social support was calculated using the scores based on social support at the time of the trauma and current social support (measured during the first assessment). As item 6 is negative, it was reverse coded. Subsequently, all items were summed to give a score ranging between 7 and 49. Higher scores on the scale indicated higher levels of perceived social support. This scale has been found to have good validity and reliability. Elklit, Pedersen, & Jind (2001) examined the psychometric properties of the Danish CSS using data from 11 studies ($n=4213$) and concluded that the scale was very robust, and had good discriminatory power and internal consistency. Other studies have demonstrated high alpha values, for example Joseph et al. (1992) found a value of 0.8 and Andrews, Brewin and Rose, (2003) found a value of 0.73 suggesting the scale has good internal consistency. Within the current sample ($n=439$) the CSS had a Cronbach's Alpha coefficient value of 0.73 both for the time of the abuse and current perceived social support.

2.5.5 Harvard Trauma Questionnaire (HTQ, Mollica et al., 1992)

The HTQ was developed for assessing trauma experiences and trauma symptoms initially among trauma exposed refugees (Mollica et al., 1992). It has been widely used and validated in many different languages (including English, Danish, Vietnamese, Cambodian, and Arabic) and many different trauma populations (including refugees, veterans and childhood trauma survivors; Hooberman, Rosenfeld, Rasmussen, & Keller, 2010; Kleijn, Hovens, & Rodenburg, 2001; Mollica et al., 1992; O'Connor & Elklit, 2008; Shoeb, Weinstein, & Mollica, 2007). The HTQ is made up of three components: types of potentially traumatic events, 16 items which correspond to the DSM-IV PTSD symptoms (see Table 2.5) and a section which is specific to the trauma population. Within the current thesis the 16 items which correspond to PTSD symptoms will be used. Each of the 16 items are measured on a 4 point Likert scale ranging from 'not at all' (1) to 'all the time' (4). The sum score (or mean score) can be used to indicate overall PTSD severity, with a higher score indicating more severe PTSD. Although cut off scores differ between studies consistent with Mollica et al's. (1992) cut off score of 40 (or mean of 2.5) has been used in this thesis to indicate probable PTSD. There are also three subscales which correspond to the three PTSD symptoms clusters: avoidance (7 items), hyper-arousal (5 items) and re-experiencing (4 items, one of which encompasses two related symptoms). The HTQ has consistently been found to have good reliability and validity (Mollica et al., 1992) and the self-report PTSD measure has been found to have an 88% concordance rate with clinician rated PTSD interviews (Mollica et al., 1992). O'Connor and Elklit (2008) found Cronbach's alpha scores ranging between 0.67 and 0.95, which indicated that the scales have good internal consistency. Within the current thesis the three subscales measured at T1 and the total PTSD score (the first 16 HTQ items) measured over 4 time points were utilised.

The Cronbach's alpha values are as follows: avoidance=0.67, hyper-arousal=0.65, re-experiencing=0.76, HTQ T1= 0.83, HTQ T2=0.88, HTQ T3=0.9, HTQ T4=0.92.

2.5.6 Trauma Symptom Checklist (TSC; Briere & Runtz, 1989)

The Trauma Symptom Checklist (TSC) was developed by Briere and Runtz (1989) with the initial aim of measuring the impact of sexual abuse in childhood on adult functioning. The items measure severity of trauma related difficulties (such as restless sleep, nightmares, guilt, trouble breathing or dizziness) within the past two months. Two additional items were added to the survey (Elklit, 1990) to measure levels of energy and anger. The 35 items were used to compute seven subscales: anxiety (e.g. tension), depression (e.g. sadness), sleep disturbances (e.g. early morning waking), dissociation (e.g. out of body experiences), somatic symptoms (e.g. stomach problems), interpersonal sensitivity (e.g. loneliness), and hostility (e.g. temper problems). Each item is measured on a 4 point Likert scale ranging from '*never*' to '*often*'.

The TSC has been found to have good reliability as well as good factorial and criterion validity and it has been argued that the total score is a robust measure of general psychological distress following a traumatic event (Krog & Duel, 2003). O'Connor and Elklit (2008) reported Cronbach's alpha coefficients ranging between 0.65 and 0.85 and Elklit (1990) found Cronbach's alpha coefficients ranging between 0.68 and 0.95. In the current study the Cronbach's alpha coefficients were as follows: overall psychological distress= 0.89, depression=0.71, anxiety=0.74, dissociation=0.73, sleep problems=0.77, somatic symptoms=0.7, interpersonal sensitivity=0.68 and hostility=0.62.

2.5.7 Coping style Questionnaire (CSQ; Roger, Jarvis, & Nararian, 1993)

The 37 item CSQ was used to assess four coping styles: detached, emotion focused, rational and has been found to be a valid and reliable measure of coping style. Participants are asked how they would describe the way they typically react to stress. Each item is measured on a four point Likert scale ranging from ‘never’ to ‘always’. Elklit (1996) confirmed the presence of four coping styles and previous research has demonstrated good reliability of all subscales with the exception of detached coping (rational = 0.70, emotional = 0.75, avoidant = 0.65, and detached = 0.43; O’Connor & Elklit, 2008). Within the current sample the Cronbach’s alpha coefficient indicated high internal consistency (rational = 0.78, emotional = 0.85, avoidant = 0.65, and detached = 0.66). An example of the CSQ items are presented in Table 1.6. Sample items are presented in Table 2.6.

Table 2.6: Sample items from the CSQ (Roger et al., 1993)

Subscale	Item
Emotion focused coping	Feel helpless, there is nothing you can do about it
	Feel worthless and unimportant
	Feel that no one understands
	Prepare myself for the worst possible outcome
Rational coping	Try to find out more information to help make a decision about things
	Use my past experience to try to deal with the situation
	Be realistic in my approach to the situation
	Take action to change things

Detached coping

Talk about it as little as possible

Respond neutrally to the problem

See the situation for what it is and nothing more

Resolve the issue by not becoming identified with it

Avoidant coping

Try to forget about the whole thing

Daydream about times in the past when things were better

Trust in fate that things will work out for the best

Sit tight and hope it all goes away

Source: Roger et al., 2003

2.5.8 The Revised Adult Attachment Scale (RAAS; Collins, 1996; Collins & Read, 1990)

The RAAS is an 18 item scale which measures how an individual feels about relationships with others. Each item is measured on a 5 point Likert scale ranging from 'not at all characteristic of me' to 'very characteristic of me'. The scale consists of three subscales: closeness (how the individual feels about being emotionally close to another person), dependency (the individuals feeling about trusting or being able to depend on others) and anxiety (the individual's feelings about being unloved). Based on these subscales individuals are categorised into one of four attachment styles: secure, fearful, anxious-ambivalent and avoidant.

The current thesis utilised dichotomous variables (1=Yes, 0=No) for the following attachment styles: secure, avoidant, anxious-ambivalent, and fearful. Studies have found that the scale has adequate reliability. Collins and Read (1990) reported Cronbach's alpha coefficients ranging between 0.51 and 0.71. The Danish version of the scale has been found to have high convergent,

discriminant and predictive validity (Pedersen, 2006). Using the current data Cronbach's alpha coefficients ranging between 0.6 and 0.74 were reported.

2.6 Descriptive statistics

All descriptive statistics reported below are based on the raw data set before the estimation of missing data.

2.6.1 Demographic characteristics

All participants in the sample were Caucasian. Participants were aged between 15 and 77 years old and the mean age was 36.46 ($SD=10.83$). The majority of the sample were female (85.8%). The mean length of time spent in education was 13.44 years ($SD=3.51$). In relation to marital status, 38% of participants were single, 24.1% were co-habiting, 25.1% were married, 1.8% had been widowed, 10.3% were divorced, and 0.7% of values were missing. As 85.4% of values relating to employment status were missing this variable was excluded from all analyses. The number of children participants had, ranged between 1 and 6 with a mean of 1.66 ($SD=1.2$).

2.6.2 Trauma characteristics

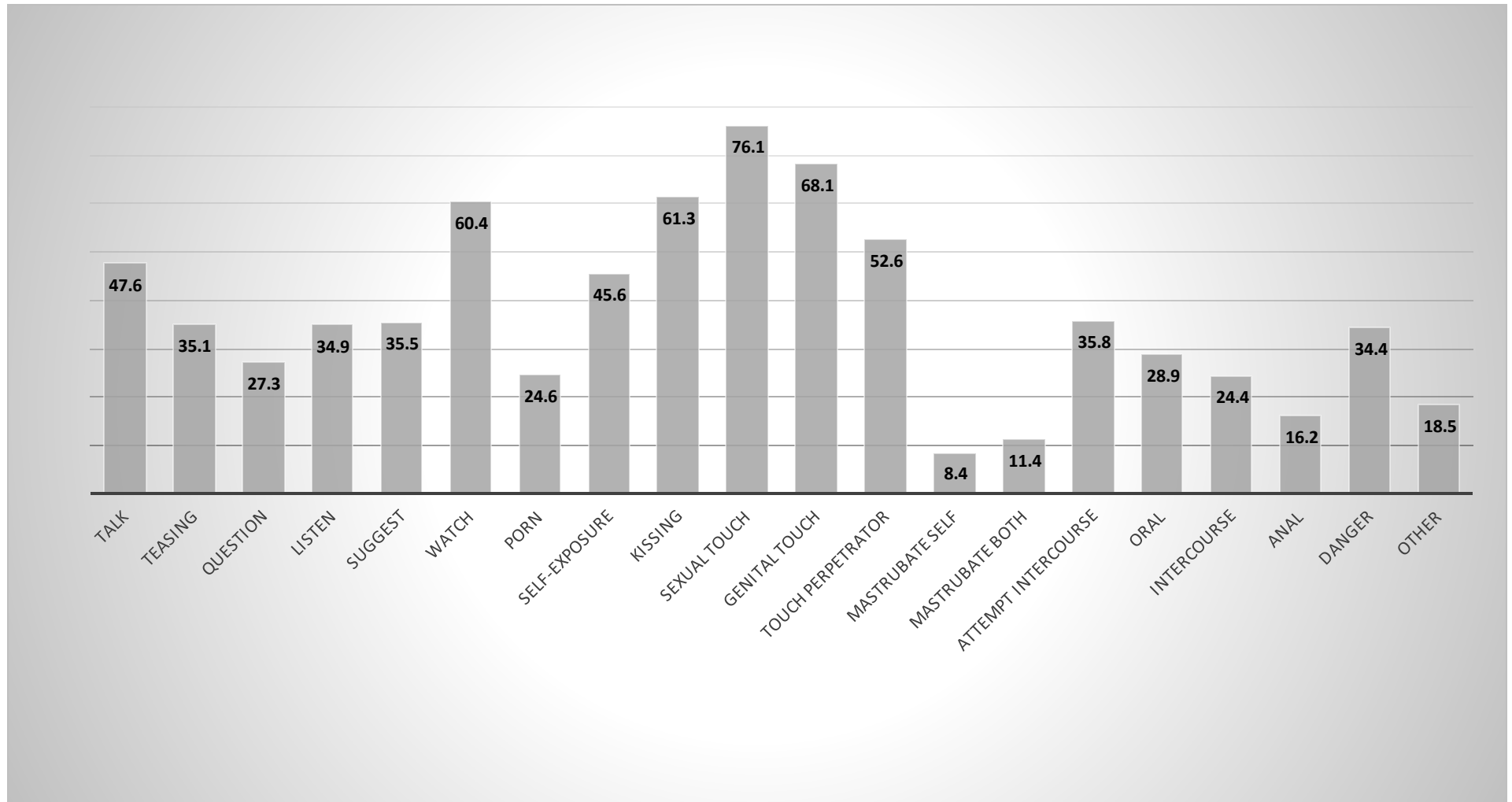
Examination of the descriptive statistics revealed that the mean age the sexual abuse started was 6.61 years of age (range=0-24, $SD=4.26$) and the mean age the abuse ended was 13.33 (range=0-54, $SD=7.38$). The types of sexual abuse acts which were endorsed are presented in

Figure 2.1. The most commonly endorsed abuse acts were: non-genital sexual touching (76.1%), sexual touching of genital areas (68.1%) and kissing in a sexual way (61.3%). The mean number of types of sexual abuse acts experienced was 7.57 ($SD=3.95$). The mean length of time since the abuse ended was 22.2 years ($SD=11.69$).

The percentages relating to the perpetrators relationship with the victim are presented in Figure 2.2. The most common perpetrator was another adult outside of the family (31.9%), a father (31.4%) or another adult family member (28%). In 92.8% of cases the perpetrator was at least five years older than the victim and 30.1% of participants had experienced sexual abuse at the hands of two or more perpetrators. The rates relating to who the individual initially disclosed their abuse to are presented in Figure 2.3. Within the current sample participants were most likely to tell their mother (25.3%), a friend (24.1%) or a partner (19%) about the abuse and were much less likely to report the abuse to a professional such as a teacher (4.1%) or a member of the police (1.1%). In relation to reporting the sexual abuse, only 16.9% of participants reported the abuse to the police, out of the individuals who did report the abuse to the police 11.3% of the reports led to a court case and 10.1% resulted in the conviction of the perpetrator. In 19.6% of these cases the perpetrator admitted the abuse.

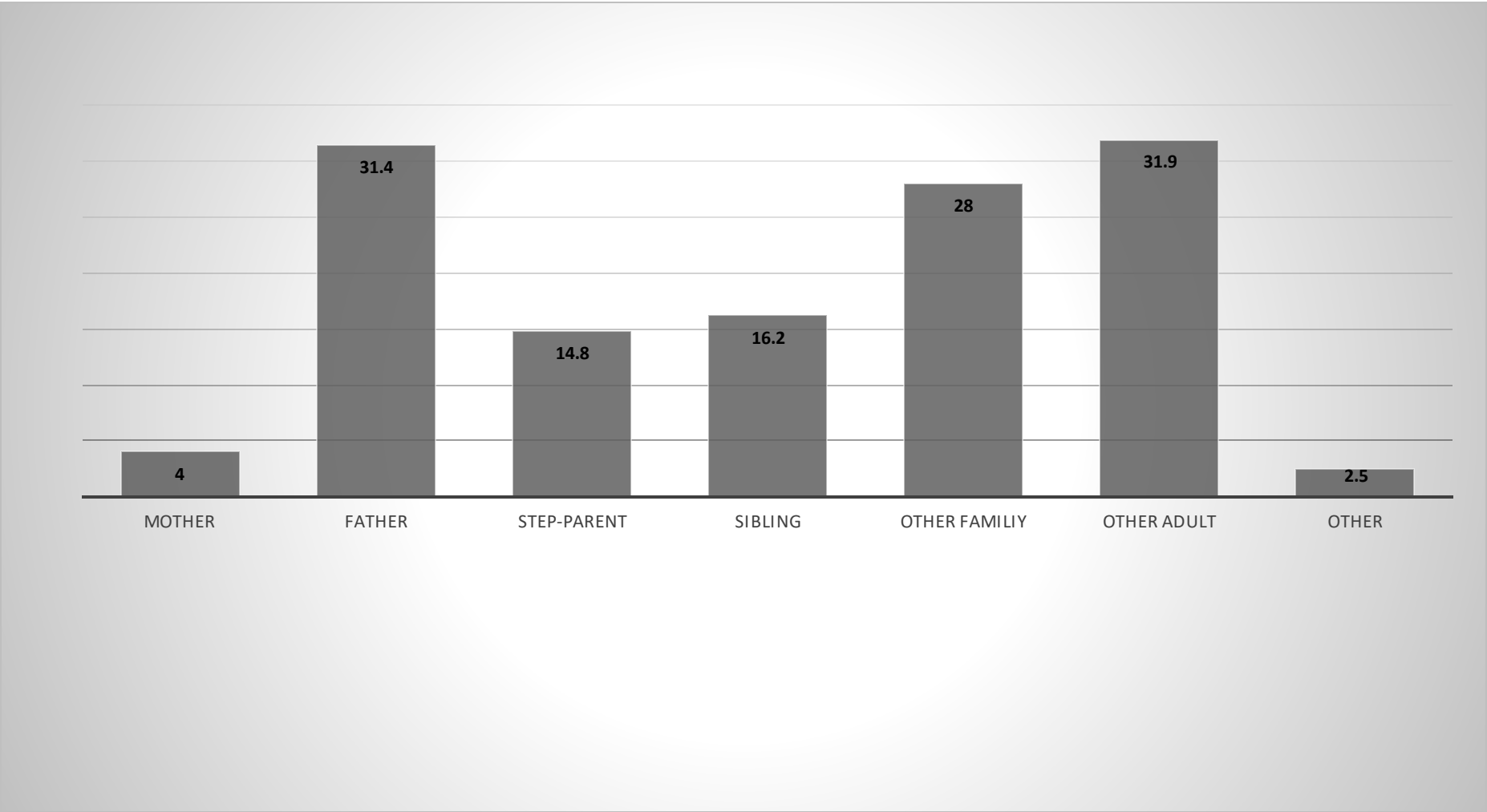
Finally, participants were asked about their experience of other potentially traumatic events. The majority (83.1%) of participants had experienced at least one other traumatic event and 59.9% had experienced a traumatic event within the past year. The mean number of traumas experienced was 2.98 ($SD=2.2$). The percentages relating to the types of traumas experienced are presented in Figure 2.4. The most commonly endorsed traumas were childhood neglect (60.8%), the death of a loved one (45.1%) and a physical assault (34.9%)

Figure 2.1: Percentages of types of sexual abuse acts endorsed by participants



Note: Other refers to a type of sexual abuse which did not fit into any other category

Figure 2.2: Percentages relating to the perpetrators relationship with the victim



Note: Other refers to a perpetrator which did not fit into any of the other categories

Figure 2.3: Percentages relating to who the victim initially disclosed their abuse to

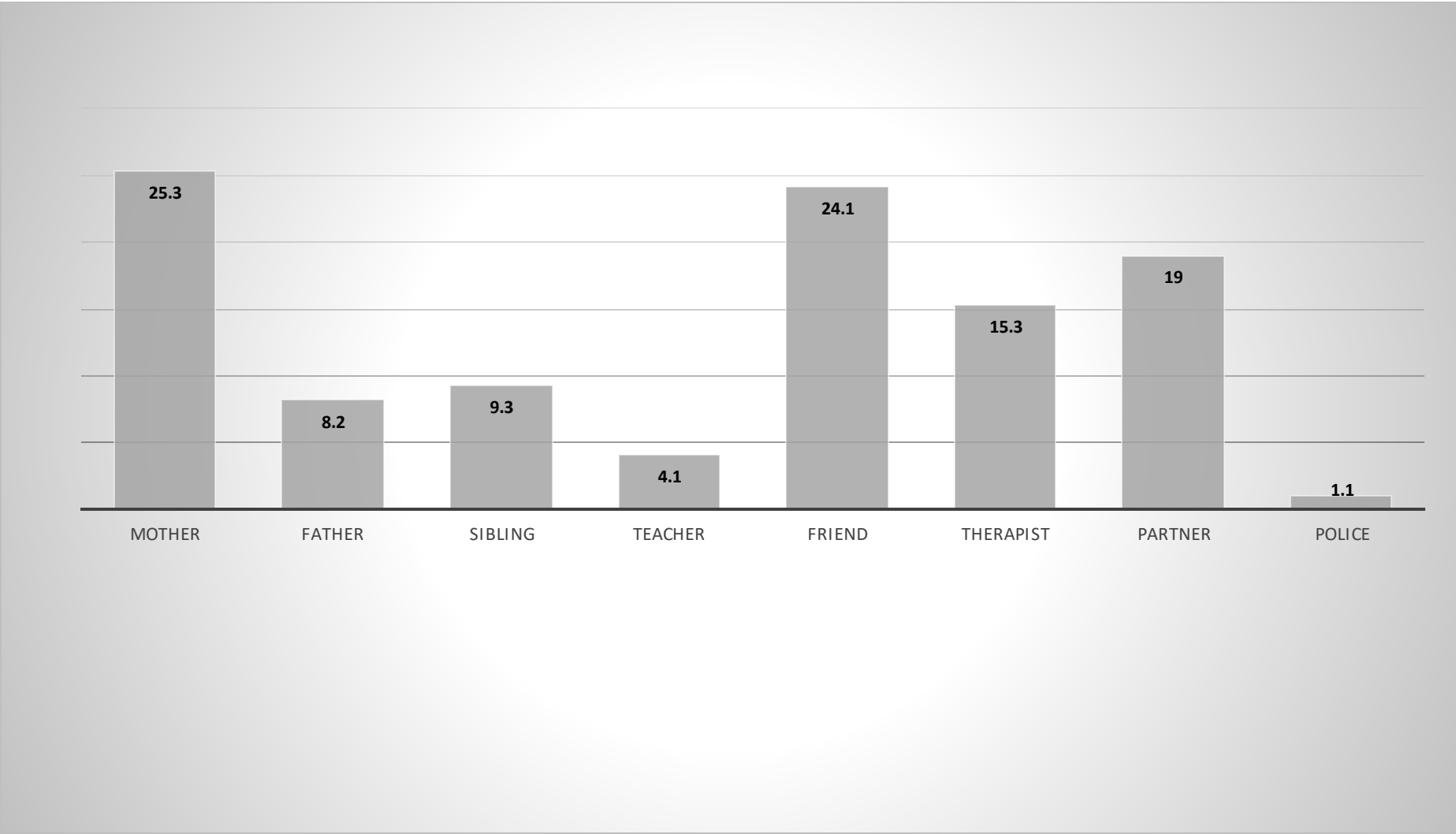
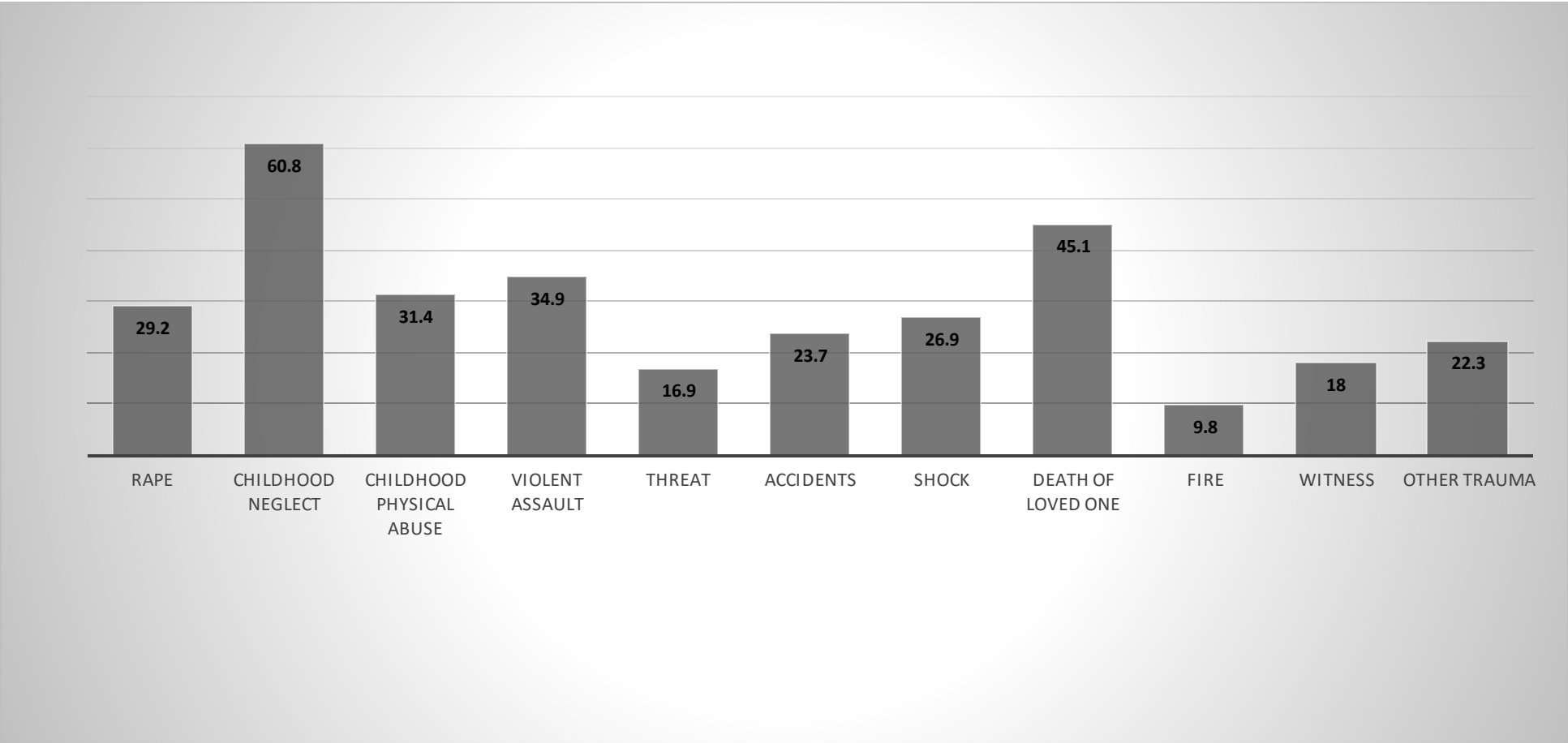


Figure 2.4: Other potentially traumatic events endorsed by participants



Note: Other refers to a type of trauma which does not fall within any of the other categories

Chapter 3: Empirically derived patterns of Axis I disorders in a sample of Danish treatment seeking survivors of childhood sexual abuse

3.1 Introduction

The current chapter will attempt to address the first aim of this thesis (which is to increase understanding of psychological outcomes among survivors of childhood sexual abuse; CSA). The study will examine the types of and the severity of psychopathology within the current sample of Danish treatment seeking CSA survivors. Firstly, the prevalence of five disorders: posttraumatic stress disorder (PTSD), dysthymia, major depressive disorder (MDD), anxiety and somatoform disorder disorders will be examined. Secondly, the prevalence rates of experiencing co-occurring disorders will be examined. Thirdly, latent profile analysis (LPA) will be conducted in order to identify hidden subgroups within this population based on the severity of each disorder. Finally, the relationship between socio-demographic variables as well as suicidality, with class membership will be examined.

The introduction of the current chapter will provide an overview of the literature relating to the wide range of negative consequences associated with CSA, the occurrence of experiencing multiple disorders/symptoms among trauma survivors and the implications of living with comorbid disorders/symptoms. Next, the theories which attempt to explain the high rates of comorbidity (the co-occurrence of two or more disorders in one individual) will be introduced. Subsequently, the limitations of these studies will be explored and the advantages of using person centred analyses (which aim to identify unobservable subgroups within a population based on similar scores; McCuthchen, 1987) will be discussed. Finally, an overview of previous studies which have used person centred methods to examine co-occurring disorders in trauma populations will be provided.

The literature discussed in Chapter 1 highlighted that a significant proportion of the global population experience CSA (Barth, Bermetz, Hein, Trelle, & Tonia, 2013; Pereda, Guilera, Forns, & Gómez-Benito, 2009; Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011; UNICEF, 2014). Within Denmark, prevalence rates have been estimated to be 0.7% for males and 6.41% for females (Christoffersen, Armour, Lasgaard, Andersen, & Elklit, 2013). Research has evidenced considerable heterogeneity in relation to outcomes among CSA survivors. While some individuals have been found to be resilient in the face of adversity others experience long term and severe negative consequences (Browne & Finkelhor, 1986; Cantón Cortés, Cortés, & Cantón, 2012). Although not all survivors experience negative consequences, CSA has been found to increase the risk of experiencing a range of long-term difficulties (Cutajar et al., 2010; Maniglio, 2009). One of the most commonly studied disorders associated with the experience of CSA is PTSD (Chen et al., 2010; Ferguson, McLeod, & Horwood, 2013; Kendall-Tackett, Williams, & Finkelhor, 1993; Paolucci, Genius, & Violato, 2001). PTSD has consistently been found to occur within clinical (e.g. Rodriguez, Ryan, Vande Kemp, & Foy, 1997) and non-clinical samples of adult CSA survivors (e.g. Ullman & Filipas, 2005). Indeed, it has been estimated that between 37% and 43% of adult survivors suffer from PTSD (Paolucci et al., 2001).

Research has also highlighted that survivors of CSA can and often do, experience symptoms or disorders which are not captured by the PTSD model (Cloitre et al., 2012; Ford & Courtois, 2009; Herman, 1995). Studies (both clinical and population based) have demonstrated that CSA predicts psychological disorders in adulthood such as PTSD, anxiety, personality disorders, suicidal feelings and behaviour, psychosis, depression, dissociation, eating disorders, somatic disorders, drug and alcohol abuse disorders and interpersonal problems (Chou, 2012; Cutajar et al., 2010; Fergusson et al., 2013; Maniglio, 2009; Turner, Taillieu,

Cheung, & Afifi, 2017). Further, there is evidence demonstrating that high rates of CSA survivors meet the diagnostic criteria for multiple disorders (Trickett, Noll, & Putnam, 2011). It has been argued that experiencing multiple disorders is the rule rather than the exception among CSA survivors (Maniglio, 2009). There are a number of theories which may explain the pervasive negative impact of CSA. For example Finkelhor and Browne (1985) suggested that four dynamics (traumatic sexualisation, betrayal, stigmatization and powerlessness) account for the range of negative consequences experienced by CSA survivors. It is thought that each of these dynamics modifies the child's cognitive and emotional view of the world, and distort the child's concept of themselves, the world and others. Each dynamic is thought to be associated with a specific set of difficulties (Finkelhor & Browne, 1985). For example, stigmatization has been found to be associated with feelings of isolation which may increase the risk of self-destructive behaviour and powerlessness is thought to be associated with anxiety and fear (Finkelhor & Browne, 1985). An alternative model which may explain the pervasive negative impact of CSA, suggests that complex trauma (multiple trauma exposures which are repeated over long periods of time; Cloitre et al., 2009) such as CSA can disrupt numerous areas of development including biological, emotional and cognitive and these difficulties in multiple areas are manifested in many ways including psychopathology, somatic symptoms and interpersonal difficulties (van der Kolk, Roth, Pelcovitz, Sunday, & Spinazzola, 2005). Thus, the evidence suggests that CSA survivors may be likely to suffer from comorbid psychological disorders, therefore, it is appropriate for research to examine multiple disorders in this population. Further, research has demonstrated high levels of variability within this population (Browne & Finkelhor, 1986). Based on this evidence, it is possible that there are distinct subgroups within the sample which vary in terms of type and severity of disorder experienced.

When examining co-morbid psychological disorders within trauma populations studies have largely focused on PTSD comorbidity. There is extensive evidence which has shown that PTSD often co-occurs with other psychiatric disorders, including conduct disorder, somatoform disorders, anxiety disorders, substance misuse disorders, psychotic disorders and depressive disorders (Breslau, Davis, Andreski, & Peterson, 1991; Kessler et al., 1995). It has been estimated that between 62% and 92% of individuals with a diagnosis of PTSD also meet the criteria for at least one other psychiatric disorder (Breslau et al., 1991; Kessler et al., 1995). Kessler et al. (1995) examined comorbidity using data from The National Comorbidity Survey, a general population sample from the U.S ($n=5877$) and found that 59% of men and 44% of women with PTSD meet the criteria for at least 3 other disorders. Depressive, anxiety and substance use disorders were the disorders which were most commonly found to be comorbid with PTSD (Kessler et al., 1995). Consistent with these findings a more recent study used the National Epidemiologic Survey on Alcohol and Related Conditions ($n=34,653$) to examine Axis I disorders comorbid with PTSD and revealed that both PTSD and partial PTSD were related to higher rates of mood, anxiety, and substance use disorders (Pietrza et al., 2011). Research has also demonstrated that PTSD commonly co-occurs with somatic or medically unexplained symptoms (Barrett et al., 2002; Gupta, 2013). For example, Barrett et al. (2002) found that individuals with PTSD were more likely to have higher rates of self-reported somatic symptoms when compared to individuals without PTSD. The evidence discussed above clearly demonstrates that individuals with PTSD are also likely to experience a range of other disorders including depression, anxiety and somatic symptoms and although PTSD comorbidity among CSA survivors has not been extensively studied, there is some research which suggests that high rates of co-occurring trauma associated disorders also exist within this population (Ackerman, Newton, McPherson, Jones, & Dykman, 1998; Trickett et al., 2011).

It is not surprising that individuals who meet the criteria for multiple disorders experience increased levels of impairment. More specifically, individuals with a diagnosis of both PTSD and depression or anxiety have been found to have decreased functioning and have an increased risk of suicidality (Calabrese et al., 2011; Drapkin et al., 2011; Ikin, Creamer, Sim, & McKenzie, 2010). For example, one study examining comorbid PTSD and depression among Korean War veterans revealed that the presence of both conditions predicted increased symptomology severity and decreased quality of life in relation to physical health, psychological wellbeing and social relationships (Ikin et al., 2010). Another study found that experiencing multiple disorders was associated with having less education, a lower income, being less likely to live with a partner and more likely to be unemployed when compared to individuals with only one disorder (Drapkin et al., 2011).

There have been a number of models proposed which attempt to explain the high rates of PTSD co-occurring with other psychological disorder. Stander, Thomsen, and Highfill-McRoy (2014) reviewed the literature examining combat related PTSD and comorbid depression and divided comorbidity theories into three categories: causal, common paths and confounding. Causal theories suggest that PTSD can cause other disorders (specifically depression within the review) or on the other hand that other disorders can cause PTSD (Stander et al., 2014). There have however been some inconsistencies in relation to the temporal order of the onset of the disorders (Stander et al., 2014). For example, it has been argued that individuals with unrelenting PTSD may become depressed or anxious about their symptoms (Andreski, Chilcoat, & Breslau, 1998). Consistent with this idea, Scheeringa and Zeanah (2008) found that PTSD was associated with an increased odds of other disorders in a sample of children and caregivers who survived Hurricane Katrina. However, contrary to these findings there has been some research which has suggested that other disorders which are comorbid with PTSD

started before the traumatic event and thus increase vulnerability of developing PTSD after a traumatic event (McMillen, North, & Smith, 2000). Moreover, there have been studies which have suggested that other disorders can develop either in the absence or the presence of PTSD following a trauma. For example one study revealed that 8% of the trauma exposed sample met the criteria for a diagnosis of depression but not PTSD (Shalev et al., 1998). Stander et al. (2014) concluded that in relation to combat related PTSD and depression the evidence strongly suggested that PTSD increases the risk of experiencing depression. However the authors also stated that the relationship is likely to be bi-directional (Stander et al., 2014).

Theories relating to common factors postulate that the comorbid disorders are independent of each other but do share a number of risk factors (necessary or sufficient for the disorder to develop) and vulnerability factors (increase odds of developing the disorder only in the presence of a causal risk factor; Breslau, 2009; Stander et al., 2014). In line with this theory, one study examined comorbidity of PTSD, depression and anxiety in 2402 adults (including healthy controls, individuals with a history of an affective disorder and individuals with a current affective disorder) and found that anxiety and depressive disorders shared significant risk factors (being female and experiencing sexual or physical abuse in childhood; Spinhoven, Penninx, van Hemert, de Rooij, & Elzinga, 2014). Finally, the confounding factors theories posit that comorbidity patterns are coincidental (Stander et al., 2014). One potential explanation for the high comorbidity rates suggests that there is a poor distinction between different disorders (Stander et al., 2014). For example, there is evidence to suggest that nonspecific difficulties such as irritability are due to negative affectivity (NA) or general distress (Elhai & Palmieri, 2011; Watson, 2005). Studies which have conducted factor analysis to examine PTSD symptoms have indicated that the PTSD symptom numbing and dysphonia are associated with mood and anxiety disorders (Simms, Watson, & Doebbellling, 2002). It was suggested that

PTSD, anxiety and depression should be categorized as distress disorders (Watson, Clark, & Stasik, 2011). Based on the above evidence it is not clear whether co-occurring symptoms relate to distinct disorders or whether they are manifestations of a single trauma related disorder. It appears that the explanation for PTSD comorbidity is extremely complex and it has been suggested that it is likely to be due to a combination of shared risk and vulnerability factors as well as bidirectional causal relationships (McMillen et al., 2000; Stander et al., 2014).

Taken together, the studies described above have highlighted that trauma survivors with one psychological disorder are more likely to experience another psychological disorder. Previous research has largely focused on PTSD comorbidity and many of these studies have used variable level approaches which aimed to explore relationships between the variables. Research has also shown that among CSA survivors there is considerable heterogeneity in terms of type and severity of psychological disorders experienced (Kendall-Tackett et al., 1993). The variable level methods however may not accurately reflect this heterogeneity among these groups of individuals. It has been argued that person centred approaches such as latent class analysis (LCA) or LPA (Muthén & Muthén, 2000) may be a useful way of examining naturally occurring patterns of co-occurring disorders (Armour et al., 2016; Au, Dickstein, Comer, Salters-Pedneault, & Litz, 2013; Contractor et al., 2015; Contractor, Roley-Roberts, Langdon, & Armour, 2017). These methods aim to explore unobservable subgroups within a population based on response patterns (McCuthchen, 1987). Recently, there has been an increase in the number of studies using these methods to examine PTSD comorbidities in different trauma populations including survivors of sexual assault (Au et al., 2013), trauma exposed soldiers (Contractor et al., 2015), veterans (Armour et al., 2015), earthquake survivors (Cao et al., 2015), survivors of vehicle accidents (Hruska et al., 2014), trauma exposed

university students (Contractor et al., 2017) and survivors of Hurricane Katrina (Lai et al., 2015). There has been one known study which has utilised cluster analysis to identify subgroups of co-occurring disorders among female CSA survivors. The study identified three clusters: one characterised by low morbidity (mean of 1 disorder), one cluster characterised by moderate morbidity (mean of 2.36 disorders) and one characterised by severe morbidity (mean of 4.75 disorders; Katerndahl, Burge, & Kellogg, 2005). However, there have been no studies which have used LCA or LPA to examine multiple subgroups of co-occurring disorders among treatment seeking CSA survivors. These methods are thought to be more robust than cluster analysis as they account for measurement error as well as using objective criteria for selecting the optimum number of classes (Muthén & Muthén, 2007). The current study will address this gap in the literature.

Results of the studies examining PTSD and co-occurring disorders in other trauma populations have revealed either three (Armour et al., 2015; Contractor et al., 2015; Contractor et al., 2017; Lai et al., 2015) or four (Au et al., 2013; Hruska, Irish, Pacella, Sledjeski, & Delahanty, 2014) class solutions which have largely differed in terms of the level of symptom or disorder severity. For example, Au et al. (2013) used LPA to examine co-occurring PTSD and depression symptoms in a sample of 119 sexual assault survivors over four time points. The results revealed 4 classes which differed in terms of severity levels as opposed to disorder type: low symptoms, low to moderate symptoms, high to moderate symptoms and severe symptoms. Consistent with this, another study (Contractor et al., 2015) used LPA to examine patterns of PTSD, depression and anxiety symptoms in a sample 1266 trauma exposed soldiers and found three class solution. Again, each class differed in terms of symptoms severity (mild, moderate and severe; Contractor et al., 2015). There have also been a number of studies which have identified classes which differ in relation to both symptom type and severity. Cao et al. (2015)

examined PTSD and depression comorbidity among 1196 earthquake survivors and found 4 classes (low symptoms, high symptoms, mainly PTSD and mainly depression). Additionally, Contractor et al. (2017) examined comorbidity profiles of PTSD and depression in a sample of 268 university students who had experienced a potentially traumatic event (PTE) and who met criteria for either PTSD or depression. The study revealed three classes; one which was characterised by severe PTSD and depression, one which was characterised by low PTSD higher depression and higher PTSD lower depression. Finally, another study which used LCA to examine patterns of PTSD comorbidity with mood disorders anxiety disorders and substance use disorders among trauma exposed individuals (n=409) (Galatzer-Levy, Nickerson, Litz, & Marmar, 2013) found three classes. One was characterised by the presence of mood and anxiety disorders, one was characterised by the presence of mood, anxiety and substance disorders and one characterised by PTSD and low comorbidity rates. Taken together, the evidence described suggests that in other trauma populations three or four distinct subgroups exist in relation to disorder/type of severity. Studies have mainly focused on PTSD, depression, anxiety and substance use disorders. Although the majority of studies have found classes which differ in terms of disorder severity others have revealed classes which are qualitatively different. There are no known studies which have used these methods (LPA/LCA) to examine patterns of co-occurring disorders among CSA survivors and based on the evidence from other trauma populations it is plausible that distinct subgroups also exist within this population.

In addition to examining subgroups of multiple Axis I disorders, the current study will examine whether socio-demographic characteristics and suicide attempts are associated with class membership. As previously mentioned experiencing comorbid PTSD and depression or anxiety has been associated with suicidality (Calabrese et al., 2011). This however has not been examined in relation to patterns of co-occurring disorders among CSA survivors. Education

has been found to be associated with resilience among CSA survivors (Edmond, Auslander, Elze, & Bowland, 2006) and has been found to be associated with latent profiles characterized by low to moderate levels of PTSD, depression and anxiety (when compared to severe levels; Contractor et al., 2015). In terms of gender there have been some mixed results. Some studies have suggested that females CSA survivors have a lower risk of severe psychopathology (e.g. DuMont, Widom, & Czaja, 2007) whereas other studies have suggested that males have a lower risk (e.g. Little & Hamby, 1999). Contractor et al. (2015) however, found that gender was not associated with PTSD, depression and anxiety profile.

In summary, the evidence suggests that CSA is associated with a wide range of psychological disorders and that trauma survivors who experience PTSD may also experience other psychological symptoms or disorders such as anxiety, depressive disorders and somatic symptoms. Further, a growing body of evidence has demonstrated that there are distinct subgroups of co-occurring disorders among trauma survivors. Understanding the relationships between these disorders has important implications relating to the conceptualisation of trauma associated disorders. Identifying multiple subgroups also has important clinical implications, such as informing assessment and the development of more tailored interventions (Armour et al., 2015; Contractor et al., 2015; Contractor et al., 2017; Lai et al., 2015). This study is the first known study to use LPA to examine depressive disorders, anxiety and PTSD among treatment seeking sexual abuse survivors. This study will extend on previous research by also including somatoform disorder. Notably, a number of the studies using LPA/LCA to examine co-occurring disorders utilised samples in which all participants met the criteria of one of the disorders under investigation. (e.g. Contractor et al., 2017). However, others did not exclude participants who did not meet the diagnostic criteria for one of the disorders (e.g. Armour et al., 2015). In order to reflect the true level of heterogeneity within the current sample this

exclusion criteria will not be applied. This will allow for the inclusion of individuals with levels of subclinical disorders as well as individuals who do not experience certain disorders.

The aims of the current study are:

1. Examine the prevalence rates of dysthymia, MDD, PTSD, somatoform disorder and anxiety
2. Examine the prevalence rates of experiencing multiple disorders
3. Examine whether distinct subgroups based on levels of dysthymia, MDD, PTSD, somatoform disorder and anxiety exist in the current sample
4. Examine whether age, sex, education and suicide attempts are associated with the identified profiles

3.2 Method

Participants

Participants ($N=456$) were outpatients attending treatment centres for adult survivors of child sex abuse in Denmark. Participants with a diagnosis of a psychotic disorder, a personality disorder characterised by perpetrating traits, displaying current self-destructive behaviour, presenting under the influence of alcohol or drugs were referred for treatment elsewhere and individuals who were already attending other treatment were also excluded. A number of participants were excluded due to missing or non-valid data (please see missing data section below). Following this the effective sample size was 348 (This is less than the other studies where the effective sample was 439 due to a number of non-valid MCMI-III assessment

scores). All participants were Caucasian. The mean age within this sample was, 37.13 ($SD=10.99$) and 84.5% of participants were female.

Procedure (For a detailed account of the procedure please refer to Chapter 2)

All participants were attending free, weekly and unlimited individual treatment sessions. Personalised psychotherapy based on the works of Theodore Millon (Millon, 1999) was conducted by psychologists. During the second therapy session all participants attending completed a number of questionnaires. These were repeated over three further time points with six monthly intervals however only data collected at T1 was utilised in the current study.

Measures (Please refer to chapter 2 for further information about all measures used)

Socio-demographic variables

Sex (male=0, female=1), education (a continuous score measured in years) and age (a continuous score measured in years) were included in the analysis.

Millon Clinical Multiaxial Inventory-III (MCMI-III; Millon, Davis, & Grossman, 2009).

Axis I disorders were measured using the MCMI-III (Millon et al., 2009). This is a 175 item self-report questionnaire, each question has two response options: true or false. The inventory includes scales for ten axis I disorders; anxiety, somatoform, alcohol dependence, drug dependence, PTSD, bi-polar disorder, dysthymia, thought disorder, MDD and delusional disorder. The following disorders were included in the current analysis: anxiety, somatoform disorder, PTSD, dysthymia and MDD. Each disorder has a base rate score which ranges between 0 and 115. A number of different cut-off scores were utilized. Scores over 65 indicated subclinical levels of the disorder, scores over 75 indicated a probable diagnosis and a scores over 85 or over a severe diagnosis (Vrieze & Grove, 2009). These cut off scores were used in another recent study utilising a dataset from the same Danish treatment used in the current study (Hyland et al., 2015). In terms of psychometric properties research has shown that the MCMI-III is a reliable and valid measure (Craig, 1999). More information about the reliability of this scale within the current sample are presented in Chapter 2. Suicidal attempts were also assessed using a single item: (I have tried to commit suicide) in the MCMI-III. The response option was true or false.

Missing data

Participants with over 20% of all baseline values missing within the wider dataset were excluded from the analysis. This resulted in the exclusion of 17 participants. The MCMI-III has a number random response indicators (validity and inconsistency; Millon et al., 2009). Individuals who did not meet the MCMI-III validity criteria were excluded. This resulted in the exclusion of 91 participants and the effective sample size was 348. All values on the MCMI-III scales were complete but the demographic variables had 6% of values missing. When

estimating missing data it is important to consider the pattern of missingness. If the missing values are not missing at random (MAR; missing values are related to another observed variable within the data but not missing data; Schafer & Graham, 2002) or missing completely at random (MCAR; missing variables are not related to any other variables in the data; Roth, 1994) it can introduce bias into the data. Little's (1988) MCAR test was not significant ($P=0.063$), suggesting that the missing data was MCAR. Based on this assumption it was appropriate to estimate the missing data. Expectation Maximization algorithm in SPSS was used to estimate all missing values.

Analytic plan

Missing data analysis and the estimation of missing data were both conducted using SPSS (Version 23). Data were then exported from SPSS to Mplus 7.2 (Muthén & Muthén, 2014). LPA was conducted using the base rate scores for PTSD, dysthymia, MDD, anxiety and somatoform disorder. LPA and LCA are forms of latent variable modelling, which aim to identify hidden subgroups within the data based on similar response patterns (Hagenaars & McCutcheon, 2002; Magidson & Vermunt, 2002; Muthén & Muthén, 2000). In the current study, LPA was chosen over LCA. LCA utilises dichotomous indicators and this would only reflect either the presence or absence of the disorder. LPA on the other hand utilises continuous variables which allows for disorder severity to be examined. All model parameters were estimated using the default estimator: robust maximum likelihood (MLR). This estimator works by testing a number of models on the data, each of which has an associated likelihood value. This value refers to the probability of the observed sample data having the parameter estimates and the final estimates are based on the values with the highest likelihood

(McLachlan & Peel, 2004). The MLR estimator has been found to be appropriate when the data does not have normal distribution (Satorra & Bentler, 1994; Yuan & Bentler, 2000) and efficient and consistent for use in large data sets (Bollen, 1989). There are however some local maxima problems which can be associated with this estimator (Muthén & Muthén, 2000). This means that due to some of the starting values used a local solution rather than a global solution is met. In order to counteract this 1000 sets of random starting values and 500 iterations were used.

One to six class models were compared and the best fit was determined by the examination of a number of fit indices. These were: the Akaike information criterion (AIC; Akaike, 1974), Bayesian information criterion (BIC; Schwartz, 1978), and the sample size adjusted BIC (SSA-BIC; Sclove, 1987). Lower values of all of the mentioned fit indices indicate an improvement in model fit. The Lo–Mendell–Rubin Likelihood Ratio Test (LMR-LRT; Lo, Mendell, & Rubin, 2001) was also examined in order to compare the fit of each model with the addition of one class. A statistically significant value suggests the model with K classes has improved model fit when compared to the K-1 model. Finally the interpretability and the meaning of the classes were taken into account when selecting the optimal number of classes. Although the entropy value was not used to assess model fit it was examined in order to assess classification certainty. Values closer to 1 suggest an improvement in classification (Ramaswamy, Desarbo, Reibstein, & Robinson, 1993). Following the selection of the optimal model each participant was assigned a class based on their most likely class membership (MLCM). This variable was saved in Mplus and was imported into SPSS where it was used in analyses to examine the relationship between class membership and socio-demographic variables and suicide attempts.

3.3 Results

The results revealed that 79% of participants met the criteria for two or more disorders when using the subclinical cut off score, 52.6% met the criteria for 2 or more disorders when using the clinical cut off score and 27.5% met the criteria for two or more disorders when using the severe cut off score. The prevalence rates of co-occurring disorders using each cut off score are presented in Table 3.1. The prevalence rates of each disorder are also presented in Table 3.1.

LPA was conducted in order to examine patterns of five Axis I disorders analysis. Models with 1-6 classes were tested and the AIC, BIC, SSABIC, LMR-LRT values were examined to assess model fit. Model fit information for the 1- through to 6 profile solutions are displayed in Table 3.2 and a graphical representation of the AIC, BIC and SSABIC values are presented in Figure 3.1. The results revealed a relatively large decrease in the fit indices with the addition of the second and third class. These indices continued to decrease through to the 6 class solution although the decrements were small between the 3 class and 6 class solution. This suggests that there are smaller relative improvements in model fit with the addition of a fourth class. This may indicate that a 3 class solution is optimal. Examination of the LMR test revealed that the value was not significant with the addition of the fourth class. This also points towards a three class solution being optimal. The three class solution was visually inspected to ensure it was theoretically meaningful. Based on this observation at the fit indices discussed above the three class solution was selected. Finally, examination of the entropy value suggested that classification rates were high.

Table 3.1: Prevalence rates of probable diagnoses of Axis I disorders

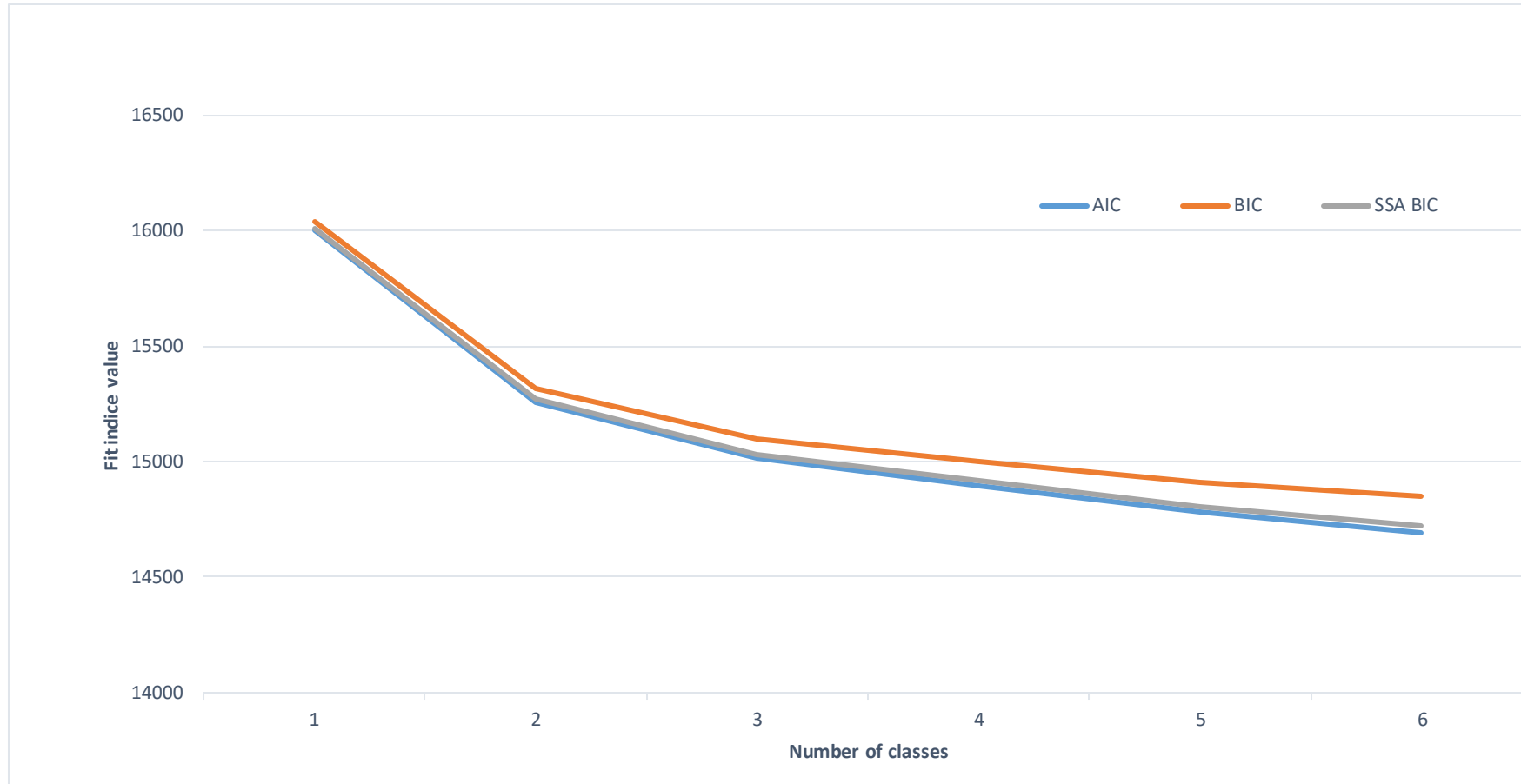
Disorders	Subclinical (Scores over 65) <i>N</i> (%)	Clinical (Scores over 75) <i>N</i> (%)	Severe (Scores over 85) <i>N</i> (%)
PTSD	224 (64.4)	72 (20.7)	37 (10.6)
Anxiety	286 (82.2)	265 (76.1)	143 (41.1)
Somatoform	176 (50.6)	75 (21.6)	35 (10.1)
Dysthymia	202 (58)	143 (41.1)	46 (13.2)
MDD	187 (53.7)	137 (39.4)	93 (26.7)
Number of disorders			
0	39 (11.2)	61 (17.5)	170 (48.9)
1	34 (9.8)	104 (29.9)	82 (23.6)
2	63 (18.1)	66 (19)	44 (12.6)
3	44 (12.6)	46 (13.2)	31 (8.9)
4	57 (16.4)	37 (10.6)	14 (4)
5	111 (31.9)	34 (9.8)	7 (2)

Table 3.2: Fit statistics for 1 through to 6 class models

No. of classes	Entropy	BIC	SSABIC	AIC	LMR-LRT (<i>P</i>)
1	-	16042.28	16010.56	16003.76	-
2	0.9	15320.03	15269.28	15258.4	736.39 ***
3	0.93	15100.05	15030.26	15015.3	248.03*
4	0.85	15002.64	14913.81	14894.77	128.86
5	0.88	14910.94	14803.08	14779.97	123.3
6	0.8	14846.08	14719.19	14691.99	97.2

Notes: BIC= Bayesian Information Criterion; SSABIC = sample-size adjusted Bayesian Information Criterion; AIC = Akaike's Information Criterion; LMR-LRT= Lo-Mendell-Rubin Likelihood Ratio Test. *= $p < 0.05$; **= $p < 0.005$; ***= $p < 0.001$; Bold = Optimal Model; Bold indicates the optimal model

Figure 3.1: Graphical representation of the fit indices for 1 through to 6 class models



Notes: AIC= Akaike's Information Criterion; BIC =Bayesian Information Criterion; SSABIC = sample-size adjusted Bayesian Information Criterion.

A visual representation of the 3 class solution is presented in Figure 3.2. The largest class ($n=213$, 61.3% based on posterior probabilities) was labelled the high disorder class. Participants in this class had the highest mean scores on all five disorders when compared to the other two classes. Further, it was characterised by clinical levels of PTSD, dysthymia, MDD and anxiety and subclinical levels of somatoform disorder. The second largest class ($n=102$, 29.3% based on posterior probabilities) was labelled the moderate disorder class. It was characterised by non-clinical levels of all disorders with the exception of anxiety. Finally, the smallest class ($n=33$, 9.5% based on posterior probabilities) labelled the no disorder class had the lowest mean scores on all five disorders when compared to the moderate and high disorder classes. This class was characterised by scores (on all disorders) which were below the subclinical cut off point.

The next stage of the analysis aimed to examine whether class membership was associated with suicide attempts and a number of demographic variables. In order to examine the relationship between dichotomous variables and class membership Chi square (χ^2) tests were conducted. One way ANOVAs were used to examine the relationship between class membership and the continuous variables. Results are presented in Table 3.3. The results indicated that sex and age were not significantly associated with class membership. Education significantly differed between classes. The low disorder class was associated with spending longer in education and had the lowest mean score when compared to both other classes ($M=15.55$, $SD=3.36$). The results also found that lifetime suicide attempts were associated with class membership. Examination of the cross tabulation revealed that there was a higher number of individuals in the high disorder class (39%) who had attempted suicide when compared to the low class (18.8%) and the moderate class (19.4%).

Figure 3.2: Graphical representations of the optimal three class solution

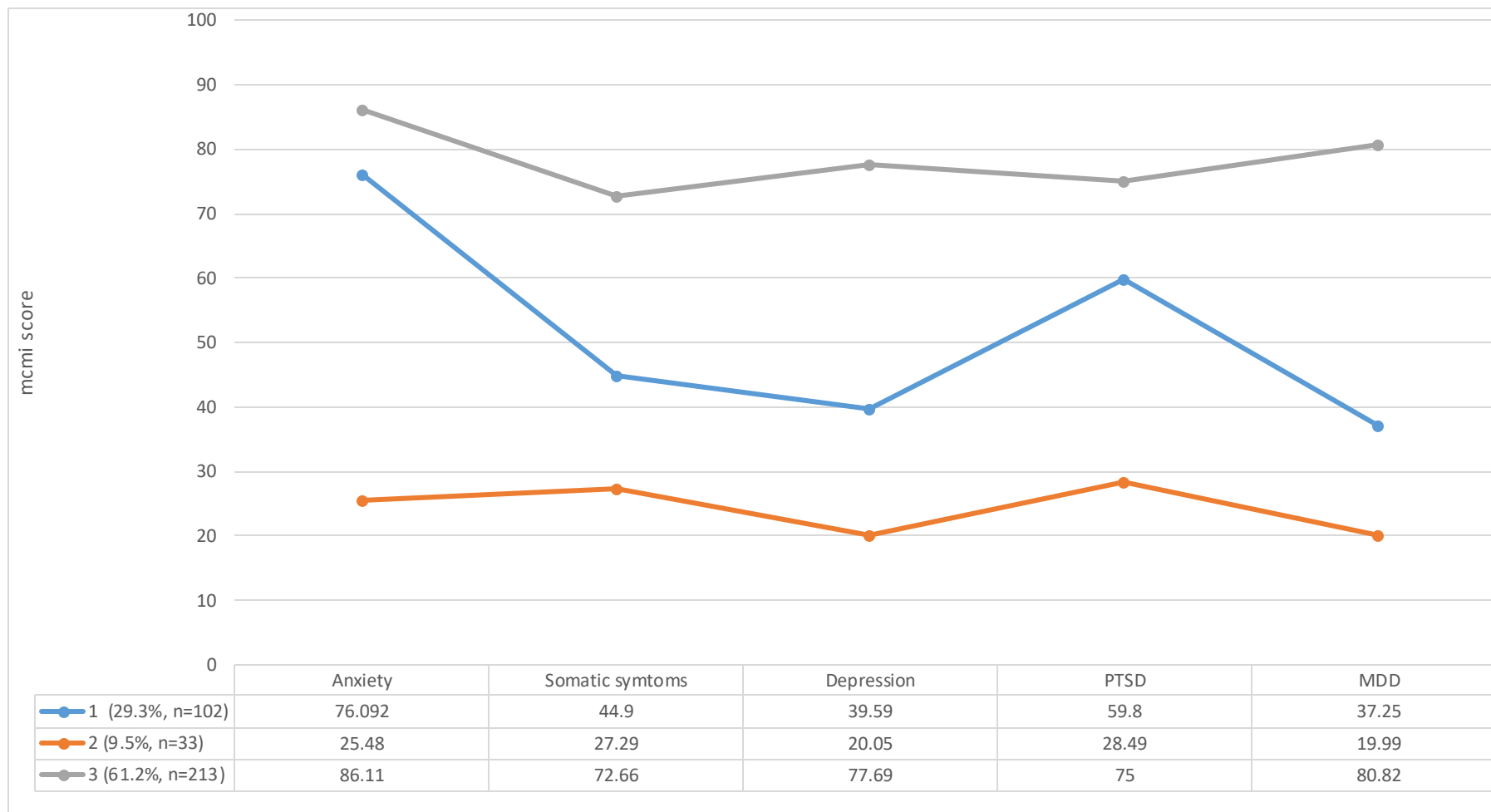


Table 3.3: Socio-demographic variables and suicide attempts in the entire sample and within each class

Variable	Total	Low	Moderate	High	F
-	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	-
Age	37.13 (10.99)	40.87 (10.07)	35.69 (10.68)	37.25 (11.18)	2.76
Education	13.62 (3.44)	15.55 (3.36)	14.32 (3.37)	12.99 (3.54)	16.31***
-	N (%)	N (%)	N (%)	N (%)	χ^2 (df)
Male	54 (15.5)	3 (9.4)	11 (10.7)	40 (18.8)	4.49 (2)
Suicide	109 (31.3)	6 (18.8)	20 (19.4)	83 (39)	14.93 (2)***

Notes: *=p<0.05; **=p<0.005; ***=p<0.001

3.4 Discussion

The first aim of this study was to examine the prevalence rates of dysthymia, MDD, PTSD, somatoform disorder and anxiety. As would be expected in a treatment seeking sample there were relatively high rates of all disorders. When using the subclinical cut off scores the prevalence rates for all five disorders ranged between 50.6% and 82.2%. When using the clinical cut off scores the prevalence rates ranged between 20.7% and 76.1% for all five disorders. Anxiety was also the most prevalent disorder when using both cut off scores. These findings are in line with a large body of literature which has demonstrated a link between the experience of CSA and adult psychopathology (Chou, 2012; Cutajar et al., 2010; Maniglio, 2009; Trickett et al., 2011). For example, one review (of fourteen reviews examining the impact of CSA) concluded that sexual abuse in childhood was associated with an increased risk of experiencing a range of psychological disorders in adulthood including: depression, PTSD, anxiety, somatic symptoms, personality disorders, psychotic disorders, eating disorders and dissociative disorders (Maniglio, 2009). The second aim of the current study was to examine the prevalence rates of experiencing multiple disorders. Previous studies have suggested that survivors of sexual abuse are likely to meet the criteria for a number of disorders (Katerndahl et al., 2005; Steine et al., 2017^b; Trickett et al., 2011). Consistent with the previous literature the results in the current study revealed that 79% of participants met the criteria for two or more subclinical disorders. This decreased to 52.6% when using the clinical cut off score. This finding highlights the importance of assessing and treating multiple disorders within this population.

The primary aim of this study was to investigate whether there were unobservable subgroups relating to the scores on five Axis I disorders. LPA revealed the presence of multiple subgroups and the three class solution was found to be optimal. The largest class (61.2%) was labelled the high disorder class. When compared to the other two classes, this class was characterised by the highest levels of all five disorders, clinical levels of PTSD, dysthymia, MDD and anxiety and subclinical levels of somatic disorder. The second class (29.3%) was labelled the moderate disorder class. This class was characterised by clinical levels of anxiety and non-clinical but relatively moderate levels of all other disorders. The third class was labelled the low disorder class and was characterised by the lowest scores for all assessed disorders. Unsurprisingly, due to the treatment seeking nature of this sample the low disorder class was relatively small (9.5%).

The three class solution found in the current study was consistent with a number of other previous studies. For example, Contractor et al. (2015) found three subgroups of PTSD, depression and anxiety symptoms in a sample of trauma exposed soldiers. Similarly, Armour et al. (2015) found three classes of PTSD and depression symptoms among Canadian veterans and Contractor et al. (2017) found three classes of PTSD and depression symptoms in a sample of trauma exposed students. Also consistent with a number of previous studies (Armour et al., 2015; Au et al., 2013; Contractor et al, 2015; Lai et al., 2015), the current study found classes which differed largely in terms of disorder severity rather than in terms of disorder type. Examination of the classes demonstrated that as the severity of one disorder increased the severity of the other disorders also increased. There were no classes which were characterised by high levels of some disorders and low levels of other disorders. Of note the moderate class was characterised by clinical levels of anxiety and non-clinical levels of dysthymia, MDD, PTSD and somatoform disorder. However despite the other disorders not reaching a subclinical

level the scores were moderate when compared to the low and high classes. This finding is similar to other studies which have suggested that anxiety occurs at a higher prevalence rate than PTSD (Contractor et al., 2015). In contrast to the current findings there have also been some studies which have identified classes which also differ in terms of symptom type (Cao et al., 2015; Contractor et al 2017). Contractor et al. (2017) found three classes when examining comorbid PTSD and depression. One class was characterised by severe PTSD and depression, the second was characterised by low PTSD and more severe depression and the third was characterised by low depression and higher PTSD. The authors suggested these inconsistencies between studies could be explained by differences in the methodologies such as the assessment methods or the populations (Contractor et al., 2017).

Within the current study, the severe disorder class was characterised by co-occurring clinical PTSD, dysthymia, MDD and anxiety and subclinical somatoform disorder. This finding is in line with studies which have suggested that PTSD, depressive and anxiety disorders are commonly comorbid (Kessler et al., 2005). Again this finding concurs with the study by Contractor et al. (2015) which identified a class with severe co-occurring PTSD, anxiety and depression. This study however expanded on previous research by also including somatoform disorder. Previous studies have shown which have found that individuals with PTSD are more likely to have high rates of physical health problems (Lauterbach, Vora, & Rakow, 2005) and somatic disorders (Gupta, 2013; van Ommeren et al., 2002). Similarly, both depression and anxiety have been found to be associated with somatic disorders (Haug, Mykletun, & Dahl, 2004). The current findings, which indicate that individuals with clinical levels of PTSD are also likely to experience other symptoms/disorder which are not reflected by a PTSD diagnosis relates to the traumagenic dynamics framework of CSA (Finkelhor & Browne, 1985). This was developed as an attempt to explain the pervasive negative sequelae associated with CSA which

were not captured by PTSD. This model suggests that the negative outcomes are not solely as a result of the abuse but as a result of four dynamics (traumatic sexualisation, betrayal, powerlessness and stigma). It has been suggested that these dynamics shape the child's view of themselves, others and the world and can lead to (Finkelhor, 1987). It is thought that each dynamic can explain different negative outcomes associated with CSA. It is possible that individuals in the high disorder class had increased difficulties across the four dynamics which lead to multiple psychological disorders. Other models which could also relate to the current findings are the concepts of complex PTSD in adults (Herman, 1995) or Developmental Trauma Disorder in children (van der Kolk et al., 2005). These disorders were proposed to reflect the broad range of symptoms experienced by individuals exposed to complex trauma.

Other studies have suggested that PTSD, depression and anxiety should be categorised as distress disorders (Simms, Prisciandaro, Krueger, & Goldberg, 2012; Watson, 2005). It has been argued the initial model which suggests that mood and anxiety disorders have a shared component (negative affectivity), is too simplistic and the model has now been expanded (Watson, 2005). One hierarchical model (which has been empirically supported) suggested that mood and anxiety disorders are characterized by a general component (associated with general distress and negative affect). However there are additional lower order structures which are unique to each disorder (Simms, Grös, Watson, & O'hara, 2008). Interestingly, Simms et al. (2012) conducted a factor analytic technique to examine the structure of anxiety, depression and somatic symptoms among primary care patients across different 14 countries (n=5433). The results indicated that all symptoms loaded on one general factor and three specific factors (relating to anxiety, depression and somatic symptoms). The authors suggested that this evidence supports the presence of a distress factor which should also include somatic

symptoms. It is possible that the distress factor may explain the presence of co-occurring PTSD, depression, anxiety and subclinical somatoform disorder in the high disorder class.

Another explanation could be that the disorders are independent and distinct but share a number of common risk and vulnerability factors (Stander et al., 2014) such as the experience of trauma in childhood. It is possible that this idea explains the lack of a 'pure' PTSD class or a class with high levels of some disorders and low of other disorders. Consistent with this, one large scale study found results suggesting that childhood physical and sexual abuse and being female predicted depression, anxiety and PTSD comorbidity (Spinhoven et al., 2014). Alternatively it is possible that within this sample PTSD causes the other disorders or the other disorders cause PTSD (Stander et al., 2014). It has been suggested that individuals with PTSD become stressed or anxious about their symptoms (Breslau et al., 1997). Stander et al. (2014) concluded that although the relationship may be partly bidirectional, PTSD influences the development of depression. There is also evidence to suggest that PTSD is a risk factor for somatic disorders and this relationship has been found to be mediated by negative affect (Elklit & Christiansen, 2009). In contrast, it has been found that individuals who experience somatic symptoms may become worried or anxious about their symptoms (Lipowski, 1990). Based on the findings in the current it is not clear whether the co-occurring symptoms relate to distinct disorders or whether they are manifestations of a single trauma related disorder. It also appears that the explanation for co-occurring symptoms/disorders is extremely complex. Further it has been argued that it is probably due to a combination of shared risk and vulnerability factors as well as bidirectional causal relationships (Stander et al., 2014). Further research attempting to understand the underlying mechanism of co-occurring disorders among CSA survivors is warranted.

The final aim of this study was to examine whether past suicide attempts, age, sex and education were associated with class membership. Chi square tests revealed that the high disorder class was associated with suicide attempts. This is consistent with the results of one study in a sample of Vietnam War veterans which found that individuals with PTSD and depression or dysthymia had an increased risk of suicidal behaviour when compared to individuals with only one disorder (Kramer, Lindy, Green Grace, & Leonard, 1994). Although further research is warranted to replicate this result and the relationship needs to be investigated in further depth, clinicians working with this population should be aware of the potential increased risk of suicide associated with experiencing multiple clinical disorders. Additionally the current study found that education was associated with low disorder class. Lower education has consistently been found to be associated with poor mental health (Dohrenwend & Dohrenwend, 1969; Murali & Oyebode, 2004). Moreover, Contractor et al. (2015) higher education was predictive of membership in the low symptom class. It has been suggested that individuals in a low social position may experience increased stress and have less resources to cope and this may further increase the risk of developing psychopathology (e.g. Dohrenwend & Dohrenwend, 1969). Further research is required to increase the understanding of the relationship between education and psychopathology among CSA survivors and of how to better support CSA survivors with low levels of education.

The findings reported in the current study have a number of important clinical and research implications. The presence of multiple subgroups suggests that a 'one size fits all' treatment may not be appropriate within this population. The identification of meaningful subgroups also highlights the usefulness of using methods such as LPA to examine heterogeneity in psychopathology outcomes among CSA survivors. Further, it is possible that there are other

factors which influence class membership for example social support, coping style and abuse characteristics. The identification of clinically relevant subgroups based on disorder severity allows researchers to further examine risk and protective factors. Understanding risk and protective factors is crucial for treatment planning as well as early prevention measures in order to ultimately improve outcomes among CSA survivors. This was beyond the scope of this study but requires further examination. The findings suggest that as one disorder increases the other disorders also increase. This highlights the importance of assessing for and treating multiple disorders including somatoform disorder. Further, individuals presenting with medically unexplained or somatic symptoms should be considered for assessment of psychological disorders including, PTSD, MDD, dysthymia and anxiety. The results also suggested that members of the high disorder group may have an increased risk of suicide attempts. Although further research is required to replicate this finding, risk of suicide should be considered a priority in treatment particularly among individuals with high levels of multiple disorders. Additionally, individuals in the high disorder class had significantly less education. CSA survivors with low levels of education should be considered at a higher risk of developing high levels of multiple psychological disorders.

The results of this study should be interpreted in light of a number of methodological limitations. Although drug and alcohol dependence are commonly found to co-occur with PTSD (Kessler et al., 1995), the decision was made not to include these in the current analysis due to the exclusion from treatment of individuals presenting with drug or alcohol problems. Future studies should include drug and alcohol use disorders when using LPA/LCA to examine co-occurring PTSD, depression, anxiety and somatoform disorders. It is also possible that the exclusion criteria (such as individuals with self-destructive behaviour or psychotic symptoms) have impacted the results, thus the generalizability is reduced. Finally, the majority of the

participants were female (84.5%). It is possible that the findings are more reflective of psychopathology among females. Further studies should utilise samples which are more equally distributed in terms of gender. This study also has some notable strengths. Firstly, a relatively large sample of treatment seeking CSA survivors was utilised. Secondly, this study has been the first study to use LPA to examine co-occurring PTSD, anxiety, MDD, dysthymia and somatoform disorders among CSA survivors.

In conclusion, the current study examined psychopathology in a large sample of treatment seeking sexual abuse survivors using a number of methods. The prevalence rates of five Axis I disorders, as well as the prevalence rates for experiencing multiple disorders were examined. The results indicated relatively high levels of all disorders with the most prevalent being anxiety. Results also indicated high rates of meeting the criteria for two or more disorders. Three subgroups labelled: high disorder, moderate disorder and low disorder, were identified. The classes differed largely in terms of disorder severity, however the individuals in the moderate disorder class had higher (clinical) levels of anxiety in comparison to the other disorders. Examination of the subgroups suggested that as severity of one disorder increased, the severity of other disorders also increased. Low education and past suicide attempts were significantly associated with membership in the high disorder class. Further research is required to replicate these findings and to further understand the underlying mechanisms which explain the relationship between the multiple disorders among trauma survivors.

Chapter 4: Examining predictors of Axis I disorder profiles among childhood sexual abuse survivors: The roles of trauma characteristics, social support and coping style

4.1 Introduction

Chapter 4 will address the second aim of this thesis, which is to identify risk and protective factors relating to outcomes among childhood sexual abuse (CSA) survivors. The current study will extend on the study described in Chapter 3. A logistic regression will be conducted in order to examine whether social support, coping style or trauma characteristics are predictive of Axis I disorder class membership. Firstly, the introduction of the current chapter will summarise the findings from the previous chapter and discuss the importance of identifying risk and protective factors associated with psychopathology among CSA survivors. Secondly, an overview of the literature and theories relating to social support, coping and trauma characteristics will be provided.

The primary aim of Chapter 3 was to examine whether there were multiple Axis I disorder profiles relating to symptom severity on five disorders: posttraumatic stress disorder (PTSD), major depressive disorder (MDD), dysthymia, anxiety and somatoform disorder among CSA survivors. The results revealed the existence of three subgroups (or classes). Members of the high disorder class (61.2%) were likely to have the highest levels of all five disorders (including clinical levels of PTSD, dysthymia, MDD and anxiety and subclinical levels of somatoform disorder). Members of the moderate disorder class (29.3%) were likely to have clinical levels of anxiety and non-clinical moderate levels of all other disorders. Finally members in the low disorder class (9.5%) were likely to have the low symptom scores (which did not reach the subclinical level) on all five disorders.

CSA is a serious public health concern and research has estimated that worldwide prevalence rates are between 8-31% for females and 3-17% for males (Barth, Bernmetz, Heim, Trelle, & Tonia, 2013). It has been found to be associated with psychological and physical health problems including PTSD, depression, anxiety, psychotic experiences, suicidal thoughts and behavior, somatic symptoms, alcohol and drug use disorders, eating disorders, personality disorders, dissociation, obesity, chronic pain (Chen et al., 2010; Cutajar et al., 2010; Kendall-Tackett, Williams, & Finkelhor, 1993; Maniglio, 2009; Paolucci, Genius, & Violato, 2001). Within the current sample, relatively high rates of PTSD (20.7%), anxiety (76.1%) MDD (39.4%), dysthymia (41.1%), somatoform disorder (21.6%) were found. Furthermore, results indicated that high rates of participants met the criteria for multiple disorders (52.6% of participants met the criteria for two or more disorders). The results discussed in Chapter 3 identified multiple subgroups which differed in terms of disorder severity which supports previous research suggesting there are high levels of heterogeneity within this population. Research has shown that the outcomes among CSA survivors are highly heterogeneous (Trickett, Noll & Putham, 2011). Given the extent of CSA (Barth et al., 2013) and the wide range of negative outcomes associated with the experience of CSA (Maniglio, 2009), understanding factors which could potentially improve outcomes for this population is imperative. It is possible that exploring predictors of the latent profiles identified in Chapter 3 could identify protective (associated with less severe psychopathology) and risk (associated with more severe psychopathology) factors. An increased understanding of risk and protective factors could assist in identifying individuals at high risk of increased negative outcomes and could inform both assessment and intervention methods. Social support (Steine, et al., 2012), coping styles (Walsh, Fortier, & DiLillo, 2010) and abuse characteristics (Kendall-Tackett et al., 1993) have been found to explain some of the variation in the outcomes among CSA survivors and will be the focus of the current study. Although there is a wealth of research

examining the role of social support, abuse characteristics and coping in determining psychological outcomes of CSA there are no known studies examining these factors in relation to Axis I disorder profiles.

Social support

Social support has been defined as the psychological and material resources which can increase an individual's ability to manage stress (Cohen, 2004). Negative social support (such as a negative reaction to a disclosure) has been found to be associated with increased negative outcomes following a traumatic experience (Ullman & Siegel, 1995) and low social support has been found to be the strongest predictor of PTSD development (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Studies in samples of CSA survivors have repeatedly found that positive social support is associated with less severe psychopathology (Elklit, 2015; Lueger-Schuster et al., 2015; Spaccarelli & Kim, 1995; Steine et al., 2012; Steine et al., 2017^b ; Tremblay, Hébert, & Piché, 1999). For example, one study found that high perceived social support was associated with less severe nightmares and insomnia among 460 Norwegian survivors of CSA (Steine, et al., 2012). Another study found that high levels of social support following a disclosure of institutional abuse (including sexual abuse) was associated with poor mental health in adulthood (Lueger-Schuster et al., 2015).

It has been argued that social support has a direct positive impact on mental health. The main effect model posits that social support has a positive impact on wellbeing regardless of the situation as it is associated with self-worth and positive moods (Cohen & Wills, 1985). Additionally, it has been suggested that social support has an indirect positive impact on mental

health by acting as a buffer against stress (Cohen & Wills, 1985). As well as social support impacting mental health there is evidence to suggest that psychopathology can have a negative impact on relationships. Kaniasty and Norris, (1993) found that low levels of perceived family support immediately after the trauma was associated with PTSD but PTSD symptoms also predicted low levels of social support. One recent study examined both directions of relationship between PTSD and social relationships and found that social support was more likely to influence PTSD development rather than vice versa (Freedman, Gilad, Ankri, Roziner, & Shalev, 2015). Taken together, there is strong evidence indicating that social support is associated with psychological wellbeing after the experience of a trauma although the exact mechanisms of the relationship are not fully understood. Although there has been a plethora of studies examining this relationship, no studies have examined social support as a predictor of Axis I disorder profiles. This will be addressed in the current study.

Coping

Coping style (described as cognitive and behavioural efforts to manage internal/external stressors and demands; Lazarus & Folkman, 1984) has also been implicated in explaining some of the variance in psychological outcomes among trauma exposed individuals. Within the current study emotional, rational, dependent and avoidant coping styles will be examined. Emotional coping which has been described as an attempt to reduce internal distress and can include methods such as avoidance, reappraisal or distraction (Lazarus & Folkman, 1984). Avoidant coping includes the use of methods such as self-distraction or substance abuse and detached coping includes methods such as feelings of disconnection and separation from the trauma; Roger, Jarvis, & Najarian, 1993). Finally, problem focused or rational coping is

characterised by reducing external stress by directly addressing the problem (Lazarus & Folkman, 1984).

During the abuse children have little control over what is happening to them thus methods which reduce psychological distress (such as emotional, avoidant and detached coping) may be used (Sigmon, Greene, Rohan, & Nichols, 1997). Although, these coping styles are adaptive at the time of the abuse, survivors often continue to use these maladaptive strategies due to the shame and stigma associated with the abuse (Gibson & Leitenberg, 2001). In the long-term these methods have been found to have a damaging impact (Merrill, Thomsen, Sinclair, Gold, & Milner, 2001). For example, emotional style coping has been found to be associated with increased psychological difficulties (O'Connor & Elklit, 2008). A review of 39 studies, examining adult coping styles among CSA survivors concluded that long term use of avoidant coping was related to increased psychological distress. (Walsh et al., 2010). Moreover, another study found that the use of avoidance strategies predicted more severe PTSD and depression in a large sample (n=1863) of adult sexual assault survivors (Ullman, Peter-Hagene, & Relyea, 2014). It has been argued that the use of maladaptive coping (such as emotional and avoidant styles) make it difficult to process the negative trauma related emotions, thus contributing to and maintaining PTSD (Ehlers & Clark, 2000). Problem focused coping however has been found to be protective and evidence has shown that it is associated with less psychological distress (Sigmon et al., 1997). It is thought that by directly addressing the emotions associated with the abuse, psychological distress is reduced (Ehlers & Clark, 2000). In summary, the evidence suggests that emotional and avoidance coping are associated with more severe psychopathology, rational coping however is protective against psychopathology. To date, there are no known studies which have examined the role of four coping styles (detached, rational, emotional and avoidant) as predictors of Axis I disorder profiles among CSA survivors.

Trauma characteristics

The role of trauma characteristics has also been implicated in explaining variation in the psychological outcomes among CSA survivors. There have however been some notable inconsistencies in the literature. Some studies have suggested that more severe abuse (such as abuse involving physical force or violence or penetrative abuse compared to non-penetrative abuse) is associated with an increased risk of developing psychological disorders such as PTSD, depression and panic disorders (Kendall-Tackett et al., 1993; Putnam, 2003; Steine et al., 2012). In contrast there has been research which has found no association between abuse severity and symptom severity (Paolucci et al., 2001). It has been suggested that differences in methodologies (such as the categorisation of severe abuse) may explain these inconsistencies in the literature (Kendall-Tackett et al., 1993).

In addition to examining the role of sexual abuse characteristics research has also focused on the experience of cumulative trauma. It is widely accepted that CSA often occurs in combination with other forms of abuse and neglect as well as growing up in a family characterised by high levels of dysfunction (Alexander & Schaeffer, 1994). Experiencing cumulative trauma during childhood has been found to be associated with an increased risk of experiencing psychopathology. Findings based on the Adverse childhood experience (ACE; $n=17,337$) have demonstrated the presence of dose response relationship between the number of cumulative traumas experienced and the number of adult health difficulties experienced (Anda et al., 2006). Consistent with these findings, one study examined childhood trauma experiences among adults with comorbid psychological and substance use disorders ($n=402$) and found that exposure to a higher number of traumas significantly increased the odds of

experiencing multiple difficulties including engaging in sex work, physical health problems, drug and alcohol use and PTSD as well as somatic symptoms (Wu, Schairer, & Dellor, 2010). Recently, Steine et al. (2017^b) examined the role of cumulative trauma as a predictor of symptom severity (including PTSD, anxiety, depression, eating disorders, insomnia, nightmares, pain, self-harm and dissociation) as well as symptom complexity (a total score of number of symptoms experienced). Results revealed a significant dose response relationship between cumulative trauma in childhood and symptom complexity (Steine et al., 2017^b). The above evidence shows that although there have been some inconsistencies in the literature, studies have largely found that more severe sexual abuse is associated with increased negative psychological outcomes. Furthermore, experiencing cumulative trauma during childhood has been found to have a dose response relationship with psychological problems.

Thus, the previous chapter identified three subgroups of Axis I disorders. Understanding what the differences are between the group characterised by high levels of psychopathology and those characterised by less severe psychopathology has important clinical implications relating to identifying at risk individuals as well as treatment planning. To date, many studies have examined factors which can explain the variation in psychological outcomes among CSA survivors. Social support and positive coping styles (such as rational coping) have been found to be protective and more severe CSA and cumulative childhood traumas have been found to be associated with increased severity of psychopathology. There are no studies which have specifically examined these factors in relation to empirically derived patterns of Axis I disorders. This will be addressed in the current study. Therefore, the aim of this study is to examine whether perceived social support (at the time of the abuse and current), coping style (detached, avoidant, emotional and rational) and trauma characteristics (number of traumas experienced, number of types of sexual trauma experienced and the experience of

penetrative sexual abuse) are predictive of the previously identified Axis I disorder profiles. The analysis will control for a number of socio-demographic variables (age, sex and education) as previous studies have found that these factors can account for some of the variations in outcomes. Based on previous literature it was predicted that social support and rational coping would be predictive of less severe psychopathology. It was also predicted that emotional, avoidant and attached coping as well as more severe abuse/trauma would be associated with more severe psychopathology.

4.2 Method

Participants

Participants used in this study were the same as those used within the previous chapter. The initial sample had 456 participants but after exclusions due to missing data and non-valid responses the effective sample size was 348. All participants were attending one of four treatment centres for the consequences associated with CSA in Denmark. The majority of the sample were female (84.5%) and the mean age was 37.12 ($SD=10.99$).

Procedure

Participants were attending weekly sessions of personality orientated psychotherapy conducted by psychologists. During the second treatment session participants completed a number of self-

report questionnaires. The responses on these questionnaires will be utilized in the current study. A full description of the procedure is provided in Chapter 2.

Measures

A detailed description of all measures used can be found in Chapter 2.

Axis I disorder profiles

The Axis I disorders profiles were identified using LPA and are discussed in chapter three. Three class's labelled high disorder (61.2%), moderate disorder (29.3%) and low disorder (9.5%) were found. Each participant was assigned to a class based on their most likely class membership.

Socio-demographic characteristics

The following Socio-demographic characteristics were included in the current analysis: age (a continuous score measured in years), education (a continuous score measured in years) and sex (coded as male=0, female=1).

Trauma characteristics

Participants were asked a number of questions about the abuse and other traumas they had experienced. All questions had yes and no response options. Three variables were created: non-contact abuse (included being questioned about sex, teased about sexuality, being made to watch pornography, spoken to about sexual acts, being made to listen to other's sexual

experiences, being asked to take part in sexual acts, having to watch someone expose themselves, or being made to expose oneself to others), contact with no penetration (included kissing, sexual touching genital or other, being made to touch the genitals of a perpetrator, and being made to masturbate or engage in reciprocal masturbation) and penetrative sexual abuse (including attempted or actual sexual intercourse this could be genital, oral or anal). For the current analysis the number of abuse types were added together, giving a total score which ranged between 0 and 3. The penetrative abuse category was also included in the analysis. Participants were also asked questions about 11 other traumas they had experienced. These questions were based on the trauma measure used in the National Comorbidity Survey (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and included violent assault, rape, childhood neglect and the death of a parent in childhood. The number of traumas experienced were summed giving a total score ranging between 0 and 11.

Crisis Support Scale (CSS; Joseph, Andrews, Williams, & Yule, 1992).

The CSS was used to measure perceived social support (both current and at the time of the abuse). The scale consists of 7 items which are measured on a 7-point Likert scale, ranging from 'never' to 'always'. The CSS (including the Danish version) has been found to have good validity and moderate to good reliability. A previous study reported Cronbach's alpha coefficients ranging from 0.67-0.82 (Elklit, Pedersen, & Jind, 2001). All items measure positive social support (e.g. received sympathy and support) with the exception of item 6 (the experience of being let down). This item was reverse coded and then all items were added to give a total score ranging from 0-49. In the current sample, the Cronbach's alpha coefficient for current social support was 0.65 and at the time of the abuse 0.6

The Coping Style Questionnaire (CSQ; Roger, Jarvis, & Najarian, 1993).

This scale has 37 items, each of which is measured on a 4-point Likert Scale ranging from 'never' to 'always'. Four subscales were used in the current study: emotional, avoidant, rational and detached. This scale has been found to be both valid and reliable (Elklit, 1996; O'Connor & Elklit, 2008). In the current study, the Cronbach's alphas were as follows: avoidant=0.65, dependant=0.66, rational=0.77, emotional =0.85.

Missing data

Prior to the data analysis, missing data were examined. Participants with over 20% of missing data on baseline measures were excluded from the analysis. This resulted in the exclusion of 17 participants. Participants who did not meet the validity criteria for the MCMI-III (see chapter 3) were also excluded from the analysis. The results of missing data analysis indicated that 88.7% of values were complete. In addition to examining the amount of missing data. It is important to examine the patterns of missing data. Missing completely at random (MCAR) occurs when the missing variables are not related to any other variables in the data (Roth, 1994). Missing at random (MAR) means that the missing values are related to another observed variable within the data but not missing data (Schafer & Graham, 2002). If the missing values are not MAR or MCAR it can potentially introduce bias into the data. Although determining whether the data is MCAR is difficult there is a statistical test which attempts to examine this (Little, 1988). Within the current study Little's (1988) MCAR test was found to be non-

significant ($p>0.05$) suggesting that the missing values are MCAR. Based on the relatively small amount of missing data and the assumption that the data was MCAR, it was deemed appropriate to estimate the missing values. Expectation maximization (EM) was conducted in SPSS to estimate all missing values. This is a two stage process, the first stage involves obtaining parameters from the available data and based on this the values are estimated by regression. The second stage involves maximisation and new parameter values are estimated with the new and original data until the data converges. This method has been found to be superior when compared to deletion (Roth, 1994) and it has been stated that the estimates are both unbiased and efficient (Graham, 2003).

Analytic plan

Following the estimation of missing data, SPSS was used to examine descriptive statistics for all variables for the full sample and for each class. The data set was imported into Mplus 7.2 (Muthén & Muthén, 2014) where a logistic regression was conducted in order to examine predictors (age, sex, education, abuse characteristics, coping style and social support) of the previously identified Axis I disorder classes (low, moderate and high). There are a number of methods which can be used to examine predictor of latent classes. The one step approach involves including covariates in the initial LCA or LPA. However, these variables can impact the formation of the classes/profiles (Asparouhov & Muthén, 2014). The three step approach involves conducting the LCA/LPA, saving the most likely class membership and using this variable in the regression (Asparouhov & Muthén, 2014). Categorising individuals based on most likely class membership can however result in inflated or deflated standard errors (Clark & Muthén, 2009). The recommended approach is called the modified three step approach, in

this method the third step (the regression) is modified to account using maximum likelihood, this has been found to result in more accurate estimates (Asparouhov & Muthén, 2014). However, in this current study the original three step approach was chosen due to the high entropy value. A value above 0.8 is acceptable (Clark & Muthén, 2009). In the previous chapter the entropy value relating to the Axis I disorder class was 0.93 thus indicating a relatively high classification accuracy. The robust maximum likelihood (MLR) estimator was used to estimate all model parameters. Studies have shown that MLR is appropriate for use in non-normally distributed data (Satorra & Bentler, 1994; Yuan & Bentler, 2000). This is efficient and consistent when used in large data sets (Bollen, 1989).

4.3 Results

Table 4.1 shows the demographic characteristics, social support (at the time of the abuse and current), coping style and abuse characteristics for the effective sample and for each individual class. A logistic regression was conducted in Mplus in order to examine predictors of class membership. All classes were compared to each other instead of using only one reference class. Odd ratios and 95% confidence intervals from the regression analysis are presented in Table 4.2. The number of traumatic events experienced and the experience of penetrative sexual abuse did not significantly predict class membership. However, the total number of types of sexual abuse experienced was significant. Each one unit increase in the number of sexual abuse types experienced was associated with being three times more likely of having membership in the high class when compared to the low class ($OR=3.23$, 95% CI : 1.36-7.68) and the moderate class when compared to the low class ($OR=3.33$, 95% CI : 1.39-7.97). In terms of social support, current perceived social support did not significantly predict class membership. However the level of perceived social support during the time of the abuse was found to be a significant

predictor. The results revealed that with each 1 unit increase in perceived social support was associated with a 6% decrease in odds of membership in the high disorders class when compared to the low disorder class. ($OR=0.94$, 95% $CI: 0.87-1.01$) and an 8% decrease in odds when of membership in the moderate class when compared to the low class ($OR=0.92$, 95% $CI: 0.58-0.99$).

Table 4.1: Demographic characteristics, social support coping style and abuse characteristics for the effective sample and for each class

Variable	Total	Low	Moderate	High
	<i>N (%) / Mean (SD)</i>	<i>N (%) / Mean (SD)</i>	<i>N (%) / Mean (SD)</i>	<i>N (%) / Mean (SD)</i>
Participants	348 (100)	33 (9.5)	102 (29.3)	213 (61.2)
Age	37.12 (10.99)	40.87 (10.07)	35.69 (11.18)	37.25 (11.18)
Education	13.61 (3.44)	15.54 (3.35)	14.31 (3.32)	12.99 (3.35)
Social support ¹	29.82 (7.36)	32.31 (7.31)	32.57 (7.02)	28.11 (6.96)
Social support ²	11.71 (11.71)	13.92 (9.05)	12.17 (5.67)	11.15 (5.07)
Emotional coping	24.84 (5.67)	19.38 (4.89)	22.43 (4.9)	26.81 (5.13)
Rational coping	24.03 (4.64)	25.91 (4.95)	25.15 (4.29)	23.21 (4.58)
Avoidant coping	21.65 (4.04)	19.58 4.24	21.09 (4.15)	22.23 3.87
Dependant coping	11.07 (2.78)	11.49 (2.87)	11.52 (3.03)	10.79 (2.62)
No. CSA types	2.38 (0.72)	1.9 (0.86)	2.45 (0.63)	2.41 (0.73)
Other traumas	3.02 (2.26)	2.68 (2.26)	2.54 (2.16)	3.31 (2.28)
Female	294 (84.5)	29 (90.6)	92 (89.3)	173 (81.2)
Penetrative abuse	209 (60.1)	14 (43.8)	64 (62.1)	131 (61.5)

Notes: ¹= current; ²= at time abuse occurred

With regards to coping style, levels of rational, avoidant and dependant coping did not significantly predict class membership. However increased levels of emotional coping were associated with increased odds of membership in the high disorder class when compared to the moderate class ($OR=1.16$, 95% CI : 1.09-1.23; odds increased by 16% with each unit increase in emotional coping) and the low class ($OR=1.35$, 95% CI : 1.15-1.58; odds increase by 35% with each unit increase in emotional coping). Further when the moderate class was compared to the low class ($OR=1.16$, 95% CI : 0.99-1.37; 16% increase in odds with each unit increase in emotional coping). When socio-demographic factors were examined education, age and sex were all associated with class membership. Higher education was associated with reduced odds of membership in the high disorder class when compared to both the low class ($OR=0.81$, 95% CI : 0.71-0.93) and the moderate class ($OR=0.92$, 95% CI : 0.85-1). Females had reduced odds of membership in the high class when compared to both the low ($OR=0.05$, 95% CI : 0.01-0.87) and moderate classes ($OR=0.3$, 95% CI : 0.14-0.66). Additionally older age was associated with reduced odds of membership in the both the high ($OR=0.95$, 95% CI : 0.9-0.99) and moderate classes ($OR=0.93$, 95% CI : 0.89-0.98) when compared to the low class.

Table 4.2: Odds ratios (95% Confidence intervals) for predictors of Axis I disorder classes

Predictors	High vs. Low	Moderate vs. Low	High vs. Moderate
Female	0.5 (0.01-0.87)*	0.33 (0.36-24)	0.3 (0.14-0.66)**
Education	0.81 (0.71-0.93)**	0.88 (0.77-0.99)	0.92 (0.85-1)*
Age	0.95 (0.9-0.99)*	0.93 (0.89-0.98)**	1.01 (0.98-1.04)
No. of CSA types	3.23 (1.36-7.68)**	3.33 (1.39-7.97)**	0.97(0.53-1.77)
Other traumas	1.08 (0.89-1.31)	0.97 (0.81-1.15)	1.12 (0.96-1.27)
Rational coping	0.9 (0.78-1.03)	0.92 (0.82-1.05)	0.97 (0.91-1.04)
Emotional coping	1.35 (1.15-1.58)***	1.16 (0.99-1.37)*	1.16 (1.09-1.23)***
Detached coping	1.05 (0.82-1.34)	1.11 (0.88-1.38)	0.94 (0.83-1.07)
Avoidant coping	1.02 (0.87-1.19)	1.01 (0.87-1.18)	1.01 (0.93-1.06)
Social support ¹	0.95 (0.88-1.02)	1 (0.95-1.01)	0.93 (0.89-0.97)
Social support ²	0.94 (0.87-1.01)*	0.92 (0.58-0.99)*	1.01 (0.97-1.06)
Penetrative CSA	0.38 (0.96-1.56)	0.48 (0.12-1.98)	1.10 (0.34-1.86)

Notes: ¹= current; ²= at time abuse occurred * $p < .05$, ** $p < .01$, *** $p < .001$

4.4 Discussion

The present study aimed to examine whether social support, coping style and trauma characteristics were predictive of previously identified profiles of Axis I disorders among treatment seeking survivors of CSA. Unexpectedly, the results indicated that current levels of perceived social support did not significantly predict class membership. Interestingly however, as predicted, perceived social support at the time of the abuse was predictive of class membership. Specifically, each one unit increase in perceived social support was associated with a 6% decrease in odds of being a member in the high disorder class when compared to the low disorder class and an 8% decrease in odds of being a member in the moderate disorder class when compared to the low disorder class.

This finding adds to the already extensive body of literature which has shown that social support is protective against psychopathology in trauma populations (Brewin et al., 2000; Ozer et al., 2003) and specifically samples of CSA survivors (Elklit, 2015; Spaccarelli & Kim, 1995; Steine et al., 2012; Steine et al., 2017^a). Further, this study suggests that social support is not only associated with more severe symptomology but also with meeting the criteria of multiple disorders (PTSD, MDD, anxiety, dysthymia and somatoform disorder). Although a causal relationship cannot be concluded, the results of the present study support both the main effects model (which suggests that social support has a positive effect on wellbeing regardless of the situation; Cohen & Wills 1985) and the social buffering theory (which suggests that social support indirectly positively impacts mental health by acting as a buffer against stress; Cohen & Wills, 1985). This finding is also in line with another recent study which suggested that although the relationship is probably partly bi-directional, social relationships influence PTSD development rather than PTSD symptoms influencing social relationships (Friedman et al.,

2015). The current findings could also be related to Finkelhor and Browne's (1985) traumagenic dynamics model of CSA which suggests that trauma related symptoms are as a result of four dynamics (sexual traumatisation, betrayal, stigmatization and powerlessness). It has been suggested that negative social reactions (relating to the disclosure or the trauma) and lack of support may increase levels of stigmatization. Further, it has been suggested that the stigmatization dynamic which can increase feelings of isolation and shame, may lead to drug and alcohol abuse as well as self-harming, low self-esteem and suicidal behaviour (Finkelhor & Browne, 1985).

Further investigations are warranted in order to increase understanding of the underlying mechanisms of this relationship. Nevertheless, this finding highlights the importance of social support in childhood for building resilience. One literature review examining resilience factors concluded that family support, positive peer relationships and social support was associated with resilience among CSA survivors (Marriott, Hamilton-Giachritsis, & Harrop, 2014). It was suggested that these factors could be improved through health promotion programs and social policies with the aim to provide sense of community and provide support (Marriott et al., 2014). Further, children known to have experienced CSA may benefit from early interventions aiming to increase social support.

The results of this study also found that coping style was predictive of Axis I disorder profiles. Notably, levels of rational, detached and avoidant coping were not significant predictors. Previous research has suggested that avoidance coping is associated with more severe psychopathology (Walsh et al., 2010). Research has also indicated that rational coping is protective against psychopathology (Sigmon et al., 1997). The measurement and categorisation

of coping styles vary widely across studies and this makes it difficult to compare results. It is possible that these methodological differences could explain the inconsistencies in the findings. As predicted and consistent with previous literature (Elklit, 2015; Sigmon et al., 1997), emotional coping (which aims to reduce emotional response without changing the external reality) was associated with more severe psychopathology as well as co-occurring disorders. It significantly predicted membership in the high disorder class when compared to the moderate disorder class and the low class and the moderate disorder class when compared to the low disorder class. As emotional coping is characterised by reducing internal distress rather than external distress (Lazarus & Folkman, 1985) it is possible that this coping style prevents individuals from making positive changes within their environment. Further, it has been suggested that this coping style makes it difficult for the trauma memories to be processed thus contributing and maintaining trauma related psychological symptoms such as PTSD (Ehlers & Clark, 2000). It is possible that if coping style was targeted during treatment that emotional coping could be reduced, this could assist in the processing of the trauma memories and ultimately reduce trauma associated symptomology.

This study also examined the impact of trauma characteristics on Axis I disorder profiles. Previous research has demonstrated that more severe sexual abuse in childhood is associated with increased negative outcomes (Kendall-Tackett et al., 1993; Putnam, 2003; Steine et al., 2012). However, there have been some mixed findings. Fergusson et al. (2013) found that penetrative abuse predicted more severe symptomology. However Steine et al. (2017^b) found that penetrative abuse did not predict PTSD severity. The current study also found that penetrative abuse was not associated with the Axis I disorder profiles. Given the inconsistencies in the findings further research is required. The total number of sexual abuse types (non-contact, contact, penetrative) was a significant predictor. Specifically, each

additional type of abuse experienced was associated with being over 3 times more likely of being in the high disorder class when compared to the low class and the moderate disorder class when compared to the moderate class. This suggests that within the current sample experiencing cumulative sexual abuse types is associated with more severe and co-occurring psychological disorders. In relation to cumulative traumas the results in this study did not replicate the results of previous studies which have suggested that cumulative trauma is associated with increased negative outcomes (Anda et al., 2006; Cloitre et al., 2009; Steine et al., 2017^a). Steine et al (2017^a) found a dose response relationship between cumulative childhood trauma and current symptom severity. Cloitre et al. (2009) also examined the role of cumulative childhood and adulthood trauma and symptom complexity in two samples: an adult clinical sample and a child clinical sample. Interestingly, childhood cumulative trauma but not adulthood trauma predicted adulthood symptom complexity. Within the current study the total number of traumas experienced included traumas which were not confined to childhood trauma. It is possible that the results would have been different if child and adult trauma were separated in the analysis. This should be examined further in samples of CSA survivors.

Finally, demographic characteristics (age, sex and education) were included in the analysis. Higher education was found to be associated with reduced odds in the high disorder class when compared to both the low disorder class and the moderate disorder class. This finding is consistent with many studies which have demonstrated that lower levels of education are associated with poor psychological health (Pedersen et al., 2008). This was also found in another recent study examining symptom profiles among trauma exposed soldiers (Contractor et al., 2015). Low education is associated with a low economic status and a low social position. These factors may increase the risk of psychological disorders due to increased stress and reduced resources (e.g. Dohrenwend & Dohrenwend, 1969). Individuals who are known to

have been sexually abused and have low education should be considered as high risk for experiencing multiple co-occurring disorders. Further research should examine how to better support these individuals. The findings also revealed that males were more likely to be in the high symptom class. There is research to suggest that females have an increased risk of experiencing PTSD (Breslau & Anthony 2007; Stein et al. 2000). Other studies however have suggested that males have an increased risk of experiencing psychopathology (Little & Hamby, 1999). It is possible that male CSA survivors have an increased risk of experiencing more severe symptomology. However, another explanation is that the females in the current sample had sought help at an earlier stage whereas the males had waited until their symptoms had become more severe before seeking help. Consistent with this idea, studies have suggested that males are less likely than females to disclose sexual abuse due to a fear of being labelled weak or homosexual (Holmes & Slap, 1998). Further, there is also evidence to suggest that males are less likely than females to seek help and when they do seek help it is often delayed (Galdas, Cheater, & Marshall, 2005). Older age was also associated with a reduced odds of being in the high disorder class and moderate disorder class when compared to the low disorder class. Previous findings relating to age and psychopathology in trauma samples have been mixed. For example, there is research which indicates age is not a significant predicate of trauma symptoms profiles (Contractor et al., 2015). However, other studies have indicated that younger age is associated with more severe PTSD symptoms (Naifeh, Richardson, Del Ben, & Elhai, 2010). Further research should attempt to examine this relationship in more depth.

The results in this study should be interpreted in the light of several limitations. Firstly, it is important to note that all participants within this sample were treatment seeking survivors of sexual abuse. It is possible that these findings cannot be generalised to non-help seeking CSA survivors. Further, there were a number of exclusion criteria (for example, self- destructive

behavior and psychotic disorders). This may further impact the representativeness of the study. Despite these limitations, this study utilized a relatively large treatment seeking sample consisting of survivors specifically of CSA. It has added to the already large body of evidence examining the roles of coping, social support and trauma characteristics as predictors of psychopathology in trauma survivors. However it was unique in examining the role of these factors in predicting Axis I disorder profiles. There are also a number of important clinical implications. One of the aims of this thesis was to identify risk and protective factors associated with psychopathology among CSA survivors. A number of risk and protective factors were identified in the current study. The results revealed that higher education, being female, having higher levels of perceived social support at the time of the abuse were associated with less severe symptom levels. The results also revealed that high levels of emotional coping and experiencing multiple types of sexual abuse was associated with more severe and complex symptomology. These factors may be important to address in early intervention programs, assessments and treatments. Researchers in this area should attempt to replicate these findings among CSA survivors and within other trauma populations. Additionally researchers should examine these factors to try to further understand the mechanisms involved.

Chapter 5: Predicting time spent in treatment in a sample of Danish survivors of childhood sexual abuse

A summary of this chapter has been published in *The Journal of Child Sexual Abuse*

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5.1 Introduction

The previous studies in this thesis have examined psychopathology (distinct symptom patterns) and associated risk and protective factors in a sample of treatment seeking childhood sexual abuse (CSA) survivors. In addition to understanding psychopathology among CSA survivors increasing understanding of treatment outcomes (such as length of time spent in treatment and treatment response) is important. Previous research has evidenced that premature treatment dropout is a significant concern among CSA survivors (Claus & Kindleberger, 2002). The current study will address the third (examining treatment attrition) and fourth (identifying predictors of length of time spent in treatment) objectives of the thesis. The study will examine the relationship between time spent in treatment and the following factors: psychopathology, social support, coping style, demographic characteristics, trauma characteristics and attachment style. Understanding factors which can explain the variation in time spent in treatment could inform assessment and treatment planning. For example, it could potentially help to identify individuals at risk of negative treatment outcomes and could also point towards factors which could be targeted during treatment. It is hoped that this could lead to better outcomes for survivors of sexual abuse. Within this introduction a brief overview of the psychological outcomes associated with sexual abuse will be provided. Subsequently, rates of treatment dropout and associated problems will be explored. Finally, literature examining factors which have been found to be barriers to treatment completion will be explored.

There is an extensive body of research providing empirical evidence of the negative consequences of CSA. A longitudinal study (n = 900) conducted over 30 years concluded that CSA was associated with an increased risk of mental health problems including: depression, anxiety, posttraumatic stress disorders (PTSD), physical health problems, low self-esteem, and

increased sexual risk taking (Ferguson, McLeod, & Horwood, 2013). Other consequences related to CSA include alcohol and drug abuse (Cutajar et al., 2010), victimisation (Arata, 2002), sexual disorders (Kristensen & Lau, 2012) and lower levels of educational attainment and income (Trickett, Negriff, Ji, & Peckins, 2011). There are a number of evidence-based, trauma-focused treatment models accessible in a variety of treatment settings, and outcome data suggests that this is effective in decreasing trauma-related symptoms in survivors of sexual abuse. For example, Taylor and Harvey (2010) conducted a meta-analysis investigating the effects of psychotherapy in adults who had been sexually abused in childhood. Forty-four studies were analysed, and it was concluded that psychotherapeutic approaches for the treatment of symptoms associated with CSA was beneficial. Furthermore, these positive effects were still apparent up to 6 months after the treatment. Consistent with this, another meta-analysis concluded that the treatment in victims of CSA was effective in reducing many of the associated trauma symptoms (Trask, Walsh, & DiLillo, 2011). Moreover, a recent study examining the effects of personalised psychotherapy in the current sample of CSA survivors demonstrated a significant reduction in PTSD symptoms and overall distress following 12 months of treatment (Elklit, 2015).

Despite the evidence suggesting that there are psychological treatments which can be effective, research has shown that high treatment dropout rates are a problem within this population. Chasson, Mychailyszyn, Vincent and Harris (2013) found that 40% of child abuse victims (aged 5–19 years) had dropped out of treatment by the 6 month point. Another study found that 28% of women prematurely left an expressive writing intervention for sexual abuse survivors (Harte, Hamilton, & Meston, 2013). Furthermore, it has been found that individuals seeking treatment for other problems (including substance abuse) are at increased risk of terminating treatment prematurely if they have a history of childhood sexual or physical abuse (Claus &

Kindleberger, 2002). This suggests that CSA survivors may be at a particularly high risk of dropping out of treatment. Premature treatment termination may decrease the positive effects of the treatment, leaving unresolved posttraumatic stress disorder (PTSD) symptoms that in turn are associated with significantly impaired functioning and psychological distress (Breslau, Lucia, & Davis, 2004). In addition to the negative personal impact of treatment attrition, there are also important cost implications. There is evidence of the huge economic burden (including medical and occupational costs as well as functional impairment) that PTSD can have on society (Kessler, 2000). Moreover, unresolved psychological symptoms are associated with seeking further treatment (Armbruster & Kazdin, 1994) as well as increased health care utilization (Tuerk et al., 2013). Given the high treatment attrition rates within childhood trauma samples and the extant literature highlighting numerous problems associated with attrition, understanding factors relating to attrition rates would be beneficial in establishing the most efficacious treatment plans for this population.

Although previous literature has highlighted factors associated with treatment attrition in childhood trauma survivors, some inconsistencies have been noted. This could be due to differing populations, interventions used, sample size, and outcome measures employed (Hatre et al., 2013). CSA survivors who drop out of treatment prematurely have been found to be younger and have a lower socioeconomic status than participants who complete treatment (Cloitre, Chase Stovall-McClough, Miranda, & Chemtob, 2004; Hatre et al., 2013). The study described in Chapter 4 revealed that older age and higher education were protective in relation to psychopathology. It is possible that these factors may also play a role in predicting time spent in treatment. Trauma characteristics have also been implicated in treatment dropout. For example, one study in a sample of abused children revealed that children who had only experienced one incident of abuse, had been abused by an older child (not an adult), and who

had not been physically injured, were at a higher risk of dropping out of treatment (Chasson et al., 2013). Contrary to this, other studies have found that experiencing more severe sexual abuse has been associated with higher rates of dropping out of interventions (Lau & Kristensen, 2007; McDonagh et al., 2005). It is possible that these inconsistencies are due to the categorisation and definition of severe abuse. Within a subset of the current sample a higher number of types of sexual abuse was associated with more severe psychological symptomology. However, penetrative abuse and cumulative trauma were not predictive of psychopathology (see Chapter 4). In the current study, trauma characteristics will be examined as predictors of time spent in treatment.

Psychopathology has also been examined as a predictor of treatment attrition. Avoidance symptoms have been found to be associated with premature dropout in child and adolescent victims of CSA (Murphy et al., 2013). Avoidance is characterised by not wanting to talk or think about the trauma, this may make attending treatment difficult and lead to premature dropout (Murphy et al., 2013). Consistent with this, increased PTSD symptom severity, personality disorder, and higher levels of depression have all been associated with attrition (McDonagh et al., 2005; Zayfert et al., 2005). This suggests that poor mental health is associated with attrition, and it could be due to a perceived lack of improvement or not having sufficient motivation to attend treatment (McDonagh et al., 2005). Three subgroups of psychopathology were identified in the current sample: high disorder class, moderate disorder class and low disorder class (see Chapter 3). Based on previous literature it is possible that individuals in the high class are at an increased risk of leaving treatment at an earlier stage when compared to individuals in the low/moderate disorder class.

In relation to coping style, positive coping strategies (including acceptance, instrumental support and humour) have been found to predict attrition in a sample of female sexual abuse survivors. It was argued that participants with positive coping may already have the tools in place to effectively manage their distress and therefore are not in need of further treatment (Harte et al., 2013). The study described in Chapter 4 demonstrated that emotional coping (characterised by attempts to reduce internal distress without modifying external factors; Folkman & Lazarus, 1984) predicted more severe trauma related symptomology. It is possible that individuals with high emotional coping could be more likely to drop out due to increased psychopathology. Alternatively, lower levels of emotional coping could be associated with early treatment dropout as the individuals may be less in need of treatment. This will be investigated in the present study. There are also a number of factors which have been found to explain variation in psychopathology among CSA survivors but have not been examined specifically as predictors of length of time spent in treatment. Firstly, social support has consistently been found to be protective against psychopathology in trauma populations (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Social support at the time of the abuse was also found to be protective within the current population (see chapter 4). Secondly, secure attachment orientations (for a description refer to Chapter 1) have been also been found to be protective (O'Connor & Elklit, 2008). It is possible that social support and attachment also influence length of time spent in treatment therefore their roles will be explored in the current study.

Although there have been numerous studies examining predictors of attrition in sexual abuse survivors, there have been few that have explored the time that the dropout occurred. In order to understand why survivors of CSA leave treatment, it is important that we know when the dropout occurs, as different factors could affect dropout at different stages of treatment (Gutner,

Gallagher, Baker, Sloan, & Resick, 2016). It is also important to note that it should not be assumed that participants who drop out early have not experienced an improvement in symptoms. It has been argued that some individuals who have been classed as “dropping out” may leave treatment because they have responded to and benefited from the treatment received thus far (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). Regardless, understanding attrition and dropout from therapy has important implications for treatment planning. The aims of this study are to:

- 1) Explore whether a wide range of baseline measures (socio-demographic characteristics, trauma characteristics, psychopathology, attachment style, coping style and social support) are associated with length of time spent in treatment.
- 2) Identify significant predictors of length of time spent in treatment (variables will be included based on the results relating to the first aim).

5.2 Method

Participants

For a detailed account see Chapter 2.

A convenience sample was derived from participants who were outpatient clients (N = 456) of incest treatment centres in Denmark. All participants were Caucasian, and the majority were female (85.8%). The sample were aged between 15 and 77 years old, with a mean age of 36 years (SD = 10.93). Exclusion criteria were the presenting under the influence of

drugs/alcohol or the presence of psychosis, a personality disorder characterized mainly by perpetrating traits (for example, aggression or causing harm to others) or self-destructive behaviour or being in receipt of treatment elsewhere. Excluded participants were referred to the relevant agency for further care where appropriate.

Procedure

For a detailed account see Chapter 2.

Data used in the current study were collected from three treatment centres in Denmark. Each centre is supported by the Ministry of Social Affairs and provides free, weekly, individual psychotherapy sessions. Personalised psychotherapy was conducted by psychologists. This method of treatment can involve multiple interventions (including cognitive, psychodynamic, and behavioural treatments) that are matched specifically to the patient depending on underlying personality features thought to be related to the problematic symptoms (Millon, 1997; 2009). Treatment plans were based on the scores derived from the initial assessment. There is no specific time frame in which to complete the treatment, and there are no limits to the number of sessions allowed. All participants attending the treatment centres were asked to complete a number of questionnaires during their second therapy session (T1). The assessments were repeated every 6 months over a period of 18 months. The data collection was in line with the Nordic ethics guidelines. All participants gave informed consent, had full anonymity, and were not compensated for participating in this study.

Measures

For a more detailed description of the measures used please refer to Chapter 2.

Length of time in treatment

Continuous variables for the duration or number of treatment sessions were not available. Participants were categorized according to the length of time spent in treatment (T1 = 0–6 months, T2 = 6–12 months, T3 = 12–18 months, and T4 = over 18 months). The participant was considered to have left treatment if there was no data for the current assessment and all subsequent assessments. This allowed for a comparison of participants who dropped out early in treatment (0–6 months) and those who stayed in treatment for longer. No information regarding reason for attrition was available.

Socio-demographic characteristics

The following socio-demographic characteristics were included in the analyses: sex (female reference group), age, and total years of education (both continuous measures). Ethnicity was not included as there was no variation among participants.

Trauma characteristics

Participants were asked a number of questions about the abuse they experienced. All questions had yes (1) and no (0) response options. For the analysis, we created three variables to categorize the type of abuse experienced: noncontact abuse, contact with no penetration, and penetrative sexual abuse. Noncontact abuse included being questioned about sex, teased about sexuality, being made to watch pornography, spoken to about sexual acts, being made to listen to other's sexual experiences, being asked to take part in sexual acts, having to watch someone expose themselves, or being made to expose oneself to others. Contact with no penetration included kissing, sexual touching (genital or other), being made to touch the genitals of a perpetrator, and being made to masturbate or engage in reciprocal masturbation. Last, penetrative sexual abuse included attempted or actual sexual intercourse (genital, oral, or anal). A sum total of sexual abuse types was also computed giving a score ranging from 0-3. Participants were asked their age at onset of sexual abuse, how long the abuse continued and how the perpetrator knew them (e.g., mother, father, sibling, etc.). Participants were also asked questions about other potential traumas they experienced. The questions were dichotomous and were based the on the trauma measure used in the National Comorbidity Survey (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), lifetime rape (someone had sexual intercourse with you when you did not want to by threatening you or using a degree of force), and childhood neglect (you were seriously neglected as a child).

The Harvard Trauma Questionnaire Part IV (HTQ-IV; Mollica et al., 1992).

The HTQ-IV (Mollica et al., 1992) a 16-item scale, measures overall PTSD symptomology and consists of three subscales: re-experiencing, avoidance, and arousal symptoms. Each item is measured on a 4 point Likert scale ranging from 'not at all' to 'all the time'. Previous studies

have reported that this scale demonstrates good reliability in measuring the symptoms of PTSD (Cronbach's alpha coefficients range from 0.84–0.94; Hansen & Elklit, 2013). In addition, the HTQ-IV has been widely validated in Denmark (Bach, 2003).

The Trauma Symptom Checklist 33 (TSC-33; Briere & Rutz, 1989; Elklit, 1990).

The 33 item TSC was used (Briere & Rutz, 1989; Elklit, 1990) along with 2 additional items (Elklit, 1990). The scale measures a range of symptoms following a traumatic event. Each item is measured on a four point Likert scale ranging from never to very often. The sum of all items measures overall distress; the subscales utilized in this study include those measuring depression, dissociation, anxiety, sleep disturbance, somatization, interpersonal sensitivity, and general hostility. Elklit (1990) found that all subscales demonstrate good reliability (Cronbach's alpha coefficients = 0.68–0.95). The TSC-33 also demonstrates good factor and criteria validity (Krog & Duel, 2003).

The Revised Adult Attachment Scale (RAAS; Collins, 1996; Collins & Read, 1990)

The RAAS (Collins, 1996; Collins & Read, 1990) scale has 18 items that are all measured on a 5 point Likert scale ranging from not at all to very characteristic of me. The current analysis utilized the categorical attachment styles: secure, avoidant, anxious ambivalent, and fearful. The scale has been found to have adequate reliability (Cronbach's alpha coefficients = 0.51–0.71; Collins & Read, 1990) and the Danish version of the scale has been validated (Pedersen, 2006).

Crisis Support Scale (CSS; Joseph, Andrews, Williams & Yule, 1992).

The CSS scale (Joseph et al., 1992) measures perceived social support with 7 items that are measured on a 7 point Likert scale, ranging from never to always. In this study, perceived social support at T1 and at the time of the abuse was measured. Evidence has shown that the scale has moderate to good reliability (Cronbach's alpha coefficients = 0.67–0.82) and good validity (Elklit, Pedersen, & Jind, 2001).

The Coping Style Questionnaire (CSQ; Roger, Jarvis, & Najarian, 1993).

The CSQ (Roger et al., 1993) scale consists of 37 items, each of which is measured on a 4 point Likert scale ranging from never to always. The subscales derived from the 37 items include the following coping styles: avoidant, emotional, detached, and rational. Validation has confirmed that there are 4 clusters (Elklit, 1992) and the Cronbach's alpha coefficients have been reported as rational = 0.70, emotional = 0.75, avoidant = 0.65, and detached = 0.43 (O'Connor & Elklit, 2008).

Axis I disorder profiles

The Axis I disorders profiles were identified using latent profile analysis (LPA) and are discussed in Chapter 3. The following disorders were included: PTSD, major depressive disorder (MDD), dysthymic disorder, somatoform disorder and anxiety. Three classes, labelled

high disorder (61.2%), moderate disorder (29.3%) and low disorder (9.5%) were found. Each participant was assigned to a class based on their most likely class membership.

Missing data

Prior to the data analysis, missing data were examined for exclusions. Participants with over 20% of missing data on baseline measures (17 participants) were excluded from the analysis. Subsequently, missing data analyses of the baseline predictor variables was conducted using SPSS version 21, prior to exporting the data to Mplus 7.3 (Muthén & Muthén, 2014) for the regression analysis. The results indicated that 97% of values in the data set were complete. Stage 1 of the analyses was conducted using this dataset. Little's (1988) missing completely at random (MCAR) test suggested that the remaining missing baseline values were missing completely at random ($\chi^2 = 3381.24, 238, p = 0.18$). This suggests that the missing values were not related to other variables in the data set (Roth, 1994). As the missing values were found to be MCAR it was deemed appropriate for all missing values to be estimated. For stage 2 of the analysis, all missing values on the baseline measures were estimated in Mplus (Muthén & Muthén, 2004). Mplus makes use of cases with incomplete data whereby missing data is estimated based on the values of the covariates in the model using full information maximum likelihood (Schafer & Graham, 2002).

Analytic Plan

SPSS was used to conduct chi-square tests (for the dichotomous variables) and one way ANOVA's (for the continuous variables) in order to identify variables that were significantly associated with length of time spent in treatment. Multinomial logistic regression analysis was conducted using Mplus (Muthén & Muthén, 2014), to examine the association between baseline predictor variables (both binary and continuous) and length of time spent in treatment (0–6, 6–12, 12–18 or 18+ months). The reference class was 0–6 months. The associations were expressed as odds ratios and their 95% confidence intervals. A set of demographic variables (sex, age, and total years of education) were selected for inclusion in the regression models in addition to the variables that had a significant relationship with the dependant variable in the initial analyses (a value of $p < 0.05$). Consistent with the analyses conducted in chapter 2 and 3 the robust maximum likelihood estimator was used for all of the regression analyses. Maximum likelihood estimators are asymptotically efficient and consistent in large samples (Bollen, 1989) and is appropriate for data that does not meet the assumption of multivariate normality (Satorra & Bentler, 1994).

5.3 Results

Length of time spent in treatment

Of the initial 439 participants, 128 (29.15%) spent 0–6 months in treatment, 116 (26.42%) spent 6–12 months in treatment, 85 (19.36%) spent 12–18 months in treatment, and 110 (25.06%) were still attending treatment at 18 months.

Stage 1

Table 5.1 shows the results of the ANOVA together with descriptive statistics of all continuous baseline measures for the full sample and for each group. The groups were categorized according to length of time spent in treatment. The results revealed that years of education and hostility had a significant effect on length of time in treatment. The chi-square tests showed no significant association between length of time spent in treatment and reporting to the police, attending a court case, prosecution of the perpetrator, marital status, relationship with the perpetrator, attachment style or Axis I disorder profile. Being male was associated with staying in treatment for 12–18 months when compared to all other categories ($\chi^2 = 8.71, 3, P < 0.05$). The experience of childhood neglect ($\chi^2 = 9.481, 3, P < 0.05$) and rape at any life stage ($\chi^2 = 6.87, 3, P < 0.05$) were both associated only with staying in treatment for 0–6 months.

Stage 2

A logistic regression was performed in order to identify significant predictors of length of time spent in treatment. Significant variables from stage 1 of the analyses were included in the regression model in addition to age (a preselected demographic variable). Participants who spent 6–12 months, 12–18 months, and over 18 months in treatment were compared to participants who only spent 0–6 months in treatment. The results of the regression are shown in Table 5.2. The odds of spending 6–12 months attending treatment were decreased by experiencing rape ($OR = 0.55, 95\% CI: 0.29–1.01$). The odds of attending treatment sessions for 12–18 months were increased by higher educational attainment ($OR = 1.12, 95\% CI: 1.04–1.21$; odds increase by 12% with each additional year of education) and by being male ($OR = 2.85, 95\% CI: 1.27–5.61$). Odds were decreased by the experience of childhood neglect

(*OR* = 0.45, 95% *CI*: 0.25–0.84). The odds of staying in treatment for over 18 months were significantly increased by higher educational attainment (*OR* = 1.09, 95% *CI*: 1–1.19; odds increase by 9% with each additional year of education).

Table 5.1: Descriptive statistics of baseline measures for total sample and groups of participants categorised by time in treatment

Variable	Total	0-6 months	6-12 months	12-18 months	18+ months	
	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	<i>F</i>
<i>N</i>	439	128	116	85	110	-
Age	36.46 (10.83)	35.95 (11.64)	35.42 (10.13)	36.41 (10.94)	38.21 (10.42)	1.4
Education	13.44 (3.51)	12.58 (3.11)	13.46 (3.28)	14.18 (2.98)	13.87 (4.33)	3.73**
Start of abuse	6.61 (4.26)	6.36 (4.43)	6.02 (4.31)	7.3 (4.04)	7.06 (4.13)	1.69
End of abuse	13.32 (7.38)	14.32 (8.44)	12.26 (7.55)	12.43 (4.59)	13.98 (7.92)	1.48
Number of CSA types	2.35 (0.74)	2.31 (0.83)	2.41 (0.73)	2.26 (0.76)	2.42 (0.64)	0.98
Social support (During abuse)	11.97 (6.21)	12.38 (6.14)	12.87 (6.28)	11.52 (6.67)	10.98 (5.75)	1.72
Social support (T1)	29.66 (7.59)	30.15 (7.63)	30.89 (7.19)	29.89 (7.39)	29.61 (7.63)	0.53
PTSD (HTQ16)	45.34 (7.91)	46.42 (8.35)	45.41 (8.57)	45.58 (6.93)	45.71 (8.17)	0.31

Re- experiencing	10.44 (2.84)	10.55 (2.84)	10.51 (2.79)	10.31 (2.73)	10.33 (2.3)	0.21
Avoidance	19.51 (4.09)	19.39 (4.17)	19.49 (4.19)	19.72 (3.38)	19.52 (4.44)	0.11
Arousal	15.39 (2.97)	15.80 (2.79)	15.14 (3.23)	15.25 (2.84)	15.61 (2.84)	1.28
Avoidant coping	21.4 (4.38)	22.33 (5.03)	21.61 (4.18)	21.34 (3.92)	21.31 (3.57)	1.35
Detached coping	10.75 (2.82)	11.23 (2.92)	10.91 (2.95)	10.47 (2.68)	10.87 (2.67)	1.16
Rational coping	23.83 (5.13)	24.29 (5.23)	24.83 (5.14)	23.36 (4.27)	24.19 (4.86)	1.26
Emotional coping	24.62 (5.84)	24.58 (5.95)	24 (6.05)	25.51 (5.98)	25.32 (5.29)	1.38
Depression	24.17 (5.19)	24.59 (5.42)	23.93 (5.19)	24.06 (4.88)	24.9 (5.11)	0.79
Anxiety	16.86 (4.68)	17.42 (5.1)	16.68 (4.47)	16.91 (4.75)	16.57 (4.3)	0.77
Somatisation	15.26 (4.15)	15.67 (4.58)	15.25 (3.89)	15.12 (4.22)	14.89 (3.86)	1.07
Sleeping	9.76 (3.19)	9.77 (3.24)	9.54 (3.22)	9.59 (3.01)	10.1 (3.25)	0.85
Dissociation	14.98 (4.26)	15.41 (4.62)	15.26 (4.37)	14.95 (4.14)	14.5 (3.88)	0.96

Hostility	7.31 (2.29)	7.7 (2.48)	7.51 (2.29)	6.98 (1.85)	6.94 (2.27)	3.12*
Sensitivity	14.4 (3.73)	14.78 (3.95)	14.38 (3.53)	14.21 (3.51)	14.12 (3.83)	0.57

**p<0.05 **p<0.005*

Table 5.2: Odds ratios and 95% confidence intervals for the predictors of time in treatment

Predictors	6-12 months	12-18 months	18+ months
Male	1.39 (0.58-3.31)	2.85 (1.27-5.61)*	1.01 (0.63-3.27)
Education	1.05 (0.97-1.14)	1.12 (1.04-1.21)**	1.09 (1-1.19)*
Age	1 (0.97-1.02)	1 (0.97-1.03)	1.02 0.99-1.04
Rape	0.55 (0.29-1.01)*	1.35 (0.72-2.52)	0.97 (0.54-1.74)
Neglect	0.69 (0.39-1.2)	0.45 (0.25-0.84)*	0.68 (0.38-1.21)
Hostility	1.06 (0.94-1.2)	0.89 (0.78-1.02)	0.91 (0.79-1.03)

* $p < 0.05$ ** $p < 0.005$

5.4 Discussion

The first aim of the present study was to examine rates of time spent in treatment in a sample of Danish sexual abuse survivors attending personalised psychotherapy. The results revealed that within the first 6 months of treatment 29.15% of participants had left treatment. This is lower than but comparable to the results from a study which found that 40% of survivors had dropped out of treatment by the six month point (Chasson et al., 2013). Given the high rates of psychopathology within this sample (see Chapter 3) it is plausible that some of individuals may have required at least six months of treatment. Based on previous research (e.g. Cloitre et al., 2004; Hatre et al., 2013) it is possible that there are barriers to remaining in treatment and understanding predictors of time spent in treatment within the current sample may inform treatment planning. It is important to note that there is no known specified time in which to complete treatment and it could not be determined whether participants terminated treatment due to a lack of improvement or due to feeling better and no longer requiring treatment.

The primary aim of the study was to identify factors that could predict length of time CSA survivors remained in treatment. Participants were categorised according to the length of time they spent in treatment, thus allowing for the comparison of participants who spent less than six months in treatment to participants who stayed in treatment for a longer period of time. Despite a lack of information regarding reasons for treatment termination, this study did identify four variables that were found to significantly predict length of time spent in treatment: sex, education, experiencing rape (at any stage of life), and experiencing childhood neglect.

Demographic characteristics

Previous research has found that younger age predicted early treatment dropout (e.g. Cloitre et al., 2004; Swift & Greenberg 2012). The results of this study, however, suggest that age is not associated with time in treatment. Higher educational attainment, on the other hand, was found to be associated with staying in treatment longer periods of time (12–18 and 18+ months when compared to 0–6 months). These results suggest that having low education may be a barrier to remaining in treatment. This finding is consistent with previous studies that have shown that less education is associated with early treatment termination in patients seeking treatment for social anxiety (Coles, Turk, Jindra, & Heimberg, 2004) panic disorder (Keijsers, Kampman, & Hoogduin, 2001), and PTSD (Rizvi, Vogt, & Resick, 2009). This finding has also been replicated with CSA survivors in treatment (Harte et al., 2013). One possible explanation for these results could be explained by the link between low educational attainment and low economic status. Lorion (1974) suggested that economically disadvantaged individuals are more likely to approach problems in a way that is “crisis reactive,” meaning only problems that reach a critical level are addressed; once the severity and the immediacy of the problem are reduced, treatment is no longer a priority and the individual may withdraw from it in order to attend to other critical needs. Based on this theory it has been suggested that patients would be more likely to stay in treatment if they feel that the need is constant across time (Ogrodniczuk, Joyce, & Piper, 2005). Worryingly, a previous study within this population (see Chapter 4) found that individuals with less education had higher odds of having more severe symptoms of PTSD, MDD, dysthymia, somatoform disorder and anxiety. This highlights that individuals with low education may be more in need of treatment. In light of these ideas about treatment withdrawal within this population, a different approach may be required to support such individuals remaining in treatment. One review of attrition in psychotherapy for those with mental health problems suggests that individuals with less education could be taught the

specific skills that facilitate treatment completion, and a brief therapy method could be utilized for treatment completion within a shorter time period (Barrett et al, 2008). Research and clinicians should further investigate how to better support CSA survivors with low levels of education.

Our results also revealed that males were more likely to stay in treatment for a longer period of time than females (12–18 months when compared to 0–6 months). This finding was surprising, as previous research has suggested that male and female interpersonal assault survivors attending treatment have symptoms which improve at a similar rate (Galovski, Blain, Chappuis, & Fletcher, 2013). However, it is possible that within this population females responded more quickly to treatment and therefore did not require treatment for as long as the males. Consistent with this argument, one study found that females were likely to experience an increased benefit of psychological treatment after a six month period when compared to males (Tarrier, Sommerfield, Pilgrim, & Faragher, 2000), and there is evidence suggesting that females are more likely to maintain improvement in PTSD symptoms following treatment (Felmingham & Bryant, 2012). Within this population it is also possible that males required treatment for longer as they were more likely than females to have more severe symptomology. This is consistent with the results found in Chapter 4. It was suggested that males were more likely to have severe symptoms of multiple disorders due to delayed help seeking (Galdas, Cheater, & Marshall, 2005). The result in the current study requires further investigation in order to understand why males in this sample were more likely than females to stay in treatment longer.

Trauma characteristics

Notably, the type of childhood sexual abuse (noncontact, contact, and penetrative) or the number of sexual abuse types were not found to be predictive of time in treatment. However, the regression analysis did indicate that the experience of rape (at any life stage) was associated with decreased odds of staying in treatment for 6–12 months. This result suggests that the experience of rape may be predictive of leaving treatment within the first 6 months, although previous research examining the role of abuse characteristics has been inconsistent. Several studies have found that more severe and frequent sexual abuse and a higher number of perpetrators were associated with early treatment dropout (Lau & Kristensen, 2007; McDonagh et al., 2005). In contrast, another study found that less severe abuse predicted dropout in a sample of abused youth (Chasson et al., 2013). Further, another study found no relationship between abuse characteristics and withdrawal from treatment (Tarrier et al., 2000). Given these inconsistencies, further research is warranted to better understand which abuse characteristics may influence length of time in treatment.

In the analysis, the experience of childhood neglect also was associated with leaving treatment early. Previous research has suggested that experiencing multiple types of trauma in childhood is associated with increased psychological problems. For example, Shevlin, Houston, Dorahy, and Adamson (2008) examined the effect of cumulative trauma on psychosis using two large community samples. The study found that experiencing two or more different types of traumas predicted psychosis, and a dose response relationship was demonstrated. In addition, exposure to a greater number of adversities in childhood has been found to be related to increased psychopathologies such as depression and anxiety and to suicidality and criminality (Petersen, Armour, & Elklit, 2013). More recently, Steine and colleagues (2017^b) examined the effects of

cumulative trauma on adult health in adult CSA survivors and found a dose response relationship between the number of types of childhood trauma experienced and risk behaviours and disease in adulthood. Experiencing an increased number of categories of trauma in childhood was associated with an increased risk of experiencing alcohol and drug problems, depression, suicidality, poor self-rated health and poor physical health in adulthood. If the outcomes for individuals who have experienced multiple traumas are more severe, it is worrying that individuals who are survivors of both CSA with rape and/or neglect are more likely to drop out of treatment within the first six months. This argument is consistent with Hembree and Foa's (2003) review of trauma interventions, which suggested that those who needed the therapy the most were more likely to drop out of treatment early. Clinicians should be aware of this finding and further investigation is warranted to understand how to better support these individuals to stay in treatment.

Psychopathology

Contrary to previous research, which has suggested more severe psychopathology predicts attrition (e.g. Zayfert et al., 2005) the current study found no association between this characteristic and time spent in treatment. Surprisingly, there were no significant differences between participants who stayed in treatment for any length of time in relation to symptoms of PTSD, depression, anxiety, somatization, sleeping problems, or dissociation. Although hostility was found to be associated with leaving treatment in the first six months, it was not found to be a significant predictor in the regression analyses. Moreover, Axis I disorder profile were not associated with time spent in treatment. This evidence suggests that psychopathology may not be an effective factor to determine risk of early attrition from treatment.

Attachment, social support, and coping style

To date there has been a lack of research examining the role of attachment and social support in CSA treatment attrition. This study found that neither attachment style nor social support (current or at the time of the abuse) were associated with length of time spent in treatment in the initial analysis. One recent study found that positive coping styles predicted attrition in female CSA survivors (Harte et al., 2013). It was suggested that this could be due to the positive coping strategies already in place for those participants, thus rendering a view of themselves as being less in need of treatment for management of the negative consequences of their trauma. Contrary to this idea, the current study found that emotional, rational, detached, or avoidant coping styles were not associated with time spent in treatment. These results suggest that social support, coping style, and attachment style may not play a significant role in determining risk of leaving treatment early within the current sample.

Conclusions

The relationships between both childhood neglect and lifetime rape with length of time in treatment were examined and the results demonstrated that in this sample, early neglect and experiencing rape were found to be predictive for staying in treatment for less than six months. This finding is worrying, as these individuals with a history of multiple traumas may have worse outcomes (e.g. Shevlin et al., 2008; Cloitre et al., 2009; Steine et al., 2017^b) and have an increased need for treatment. The results also revealed that low education was associated with

spending less time in treatment. It is possible that low levels of education and cumulative trauma (specifically CSA and rape and/or childhood neglect) are barriers to remaining in treatment and researchers and clinicians should try to explore how to support these individuals to engage in treatment if required. Finally, being male was found to be associated with staying in treatment for longer. Given these findings, clinicians should be aware of the factors likely to predict time spent in treatment in order to identify individuals who may be at risk of dropping out at an early stage. Treatment modifications are suggested to increase completion rates of treatment, specifically in patients with less education and who have experienced multiple traumas if it is deemed beneficial for the individual. It is possible that these patients are in greater need of treatment, and by addressing the potential for early treatment dropout, clinicians may improve outcomes for their patients. More effective treatment will result in not only a reduction in distressing trauma-related symptoms, thus increasing productivity and enhancing the quality of life for those patients, but treatments will be more cost-effective and accessible to those in need.

Strengths and limitations

The current study utilized a large longitudinal data set with consecutive outpatients receiving treatment for trauma-associated symptoms. The current study has added to the current literature which has suggested that there are high treatment dropout rates in samples of survivors of sexual abuse. Further the analysis identified factors that could potentially be used to predict risk of early withdrawal from treatment. This was the first known study to examine social support and attachment as predictors of time in treatment among CSA survivors. The results of this study should be interpreted in light of several limitations. Of concern is that there was no

information gathered regarding number of treatment sessions each participant attended, therefore the exact point of dropout within each six month period cannot be determined. The individualised nature of the treatment further limits the conclusions that can be drawn as it is possible that the type of treatment was related to the number of treatment sessions required and it cannot be ruled out that individuals with more severe psychopathology had a more intensive treatment over a shorter period of time. Therefore we cannot conclude that the predictors of length of time spent in treatment also predict treatment attrition.

Childhood abuse was measured using retrospective self-reports; although data gathered in this manner may not be as reliable, at least one study has demonstrated that retrospective self-reports of sexual abuse were found to have good convergent validity with clinical case notes, and reports remained consistent over a period of seven years (Fisher et al., 2013). This suggests that retrospective reports of abuse have reliability and validity and as such are adequate ways to gather data regarding histories of abuse. In the current study, there was no specified time during which treatment was to be completed; therefore, it could not be determined whether participants terminated treatment due to a lack of improvement or due to feeling better and no longer requiring treatment. Elklit (2015) studied the same sample used in the current study and found that the greatest improvements in symptoms occurred within the first six months, with substantial improvements in mental health symptoms after one year of treatment. However, it was suggested that there were still some improvements to be made even after one year of treatment (Elklit, 2015). This may suggest that after six months of treatment, some participants had improved significantly and left treatment at that stage due to treatment success.

Future studies should consider the limitations herein and focus on continued exploration of specific traits that may predict treatment dropout in this population. Given the positive outcomes reported in those who complete treatment after experiencing traumatic events, this information is essential for clinical efficacy and effectiveness of treatment planning. Further research should include post treatment reasons for dropout where possible, as this may help to disentangle the patients who end treatment because they have benefitted from it versus those who drop out for other reasons.

Chapter 6: Posttraumatic stress disorder treatment response trajectories among Danish sexual abuse survivors

A summary of this chapter in combination with Chapter 7 has been published in the Journal of Interpersonal Violence

Fletcher, S., Elklit, A., Shevlin, M., & Armour, C. (2017). Predictors of PTSD treatment response trajectories in a sample of childhood sexual abuse survivors: The roles of social support, coping and PTSD symptom clusters. *Journal of Interpersonal Violence*.

6.1 Introduction

The current thesis aims to examine a number of psychological and treatment outcomes in a large sample of Danish childhood sexual abuse (CSA) survivors attending personality based psychotherapy. So far the studies within this thesis have examined patterns of Axis I disorders and length of time spent in treatment in the current sample. Another important area of research is examining heterogeneous patterns of posttraumatic stress disorder (PTSD) among CSA survivors attending treatment. The present chapter will address the fifth (identify the changes in PTSD symptomatology over time) and sixth (examine whether all participants follow a similar trajectory in relation to longitudinal PTSD or whether there are multiple trajectories) research objectives. Research has demonstrated that there is a strong link between CSA and the development of PTSD (e.g. Chen et al., 2010; Fergusson, Boden, & Horwood, 2008; Paolucci, Genius, & Violato, 2001). Studies examining the effectiveness of treatments for PTSD have generally examined changes in group means over time (Taylor & Harvey, 2010). This however does not take varying treatment responses into account. Within this study, the mean scores of PTSD over 4 time points (and a total period of 18 months) will be examined. Subsequently, latent class growth analysis (LCGA) will be conducted in order to examine the presence of distinct PTSD treatment response trajectories. The introduction of the current chapter will discuss literature showing an association between CSA and PTSD. Subsequently, some of the theories relating to the development and maintenance of PTSD will be examined. Finally an overview of studies examining PTSD treatment response trajectories within other trauma populations will be explored.

Sexual abuse in childhood can have devastating long term effects on the lives of the victims. Studies have shown that CSA is associated with mental health difficulties such as depression

and PTSD, physical health problems, low self-esteem, sexual risk taking, re-victimisation, alcohol and drug abuse, and lower educational attainment and income (Arata, 2002; Cutajar et al., 2010; Fergusson, McLeod, & Horwood, 2013; Trickett et al., 2011). A strong link between CSA and PTSD (for a description refer to Chapter 1) has consistently been demonstrated by both clinical and epidemiological studies (e.g. Chen et al., 2010; Fergusson et al., 2008; Paolucci et al., 2001). For example, one recent study which utilised a sample of nationally representative adults found that survivors of CSA were significantly more likely ($OR=5$, 95% CI : 4.53-5.52) to experience PTSD than those who had not experienced CSA (Perez-Furtes et al., 2013). Furthermore, a meta-analysis of 37 studies revealed that between 37% and 43% of individuals who experienced CSA also met the criteria for a PTSD diagnosis (Paolucci et al., 2001). The concept of PTSD was initially developed in order to describe the symptoms associated with combat (Kendall-Tackett & Marshall, 1998). However, it has since been revised and it is accepted that there are a large number of potentially traumatic events which could lead to PTSD including the experience of CSA (APA, 2013).

There are a number of models which may explain why PTSD develops among individuals who have experienced trauma during childhood. The emotional processing theory (Foa & Kozak, 1986) is based on Lang's (1977) theory of fear which suggests that stimuli, responses and the meanings of fear are represented in an individual's memory. This allows the individual to escape or avoid danger. Following a traumatic event these representations (which influence cognition, behaviour, and physiology) can become excessive and resistant to change. PTSD is thought to be related to two specific maladaptive beliefs (which the individual may not be consciously aware of). Firstly, a belief that the world is dangerous and secondly the belief that the individual themselves are incompetent. These beliefs can subsequently lead to avoidance behaviour which further maintain the maladaptive beliefs as there is no opportunity to

experience contradictory evidence. Based on this theory treatment focuses on exposure to evidence which aims to reduce these beliefs. Other theories suggest that cognitive factors lead to the development and maintenance of PTSD symptomology (e.g. Ehlers & Clark, 2000). It has been argued that appraisals associated with anticipation of current threat underlies PTSD. This theory also suggests that PTSD stems from two dysfunctional beliefs: the world is a dangerous place and the self as incompetent. Contrary to the emotional processing theory, this model posits that the individual is aware of and therefore able to modify these beliefs. Based on this theory treatment focuses on challenging the maladaptive beliefs (e.g. Ehlers, Clark, Hackmann, McManus, & Fennell, 2005). Alternatively, the dual representation theory (Brewin, Dalgleish, & Joseph, 1996), suggests that there are two systems involved in storing trauma related memories: the verbally accessible memory (VAM) and the situationally accessible memory (SAM). Memories stored as VAM can be easily retrieved and have been consciously processed. However memories stored as SAM (including memories such as sounds, smells and physiological responses associated with the abuse) have less conscious processing and cannot easily be accessed or communicated. The SAM system is thought to be responsible for the experience of flashbacks. Based on this theory treatment focuses on reducing negative emotional reactions associated with negative appraisals and decreasing the triggering of SAM (Brewin et al., 1996).

In addition to experiencing the distressing symptoms, PTSD can impact many areas of an individual's life. For example, one study found that PTSD was associated with poor mental health quality of life (Chopra et al., 2014). Furthermore, PTSD has been found to be associated with a range of other psychological disorders (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Consistent with these findings, the study described in Chapter 3 found that 61% of the

current sample of treatment seeking CSA survivors were members of a subgroup characterised by clinical PTSD, dysthymic disorder, major depressive disorder (MDD), anxiety and subclinical somatoform disorder. Given the high rates of PTSD among CSA survivors and the devastating impact it can have it is not surprising that survivors may require treatment during childhood or adulthood. To date, there are a number of evidence based psychological treatments which have proved to be effective in reducing trauma associated symptoms including, cognitive behavioural therapy, (CBT; Cloitre, Koenen, Cohen, & Han, 2002) and cognitive processing therapy (CPT; Chard, 2005). For example, one meta-analysis of 44 studies (comprising 59 treatment conditions) found moderate effect sizes for PTSD in adults attending treatment for CSA related psychopathology ($g=0.72-0.77$; Taylor & Harvey, 2010). Consistent with these findings a report by the Institute of Medicine's Committee on Treatment of Posttraumatic Stress Disorder (2007) conducted a systematic review of treatment for PTSD and concluded that psychotherapy was the most effective.

In order to examine whether treatment has been effective in reducing symptoms it is important to understand how PTSD symptoms change over the course of treatment. Although there have been a number of studies and subsequent meta-analyses exploring changes in PTSD over the course of treatment among CSA survivors, the majority of studies have examined changes in group means over time (Chard, 2005; Cloitre et al., 2002; Cole, Sarlund-Heinrich, & Brown, 2007; Taylor & Harvey, 2010). This method however, does not reflect differential treatment response trajectories. For example, some victims may have symptoms which improve over time and others may deteriorate or remain stable. One study examining changes in PTSD symptoms over time in a sample of Danish rape victims ($n= 255$) found that one group experienced less severe but stable PTSD symptoms over time and the other group experienced

high levels of PTSD symptoms, which improved over time (Armour, Shevlin, Elklit, & Mroczek, 2012). Although this was not specifically a treatment seeking population it demonstrates that not all sexual assault victims experience similar longitudinal patterns of PTSD. Moreover, research within other treatment seeking trauma populations has evidenced that substantial individual differences in the treatment outcomes exist. Recently, there has been an increase in the number of studies which have identified distinct subgroups which differ in terms of levels and rates of PTSD treatment response. To date these studies have been conducted among a number of trauma populations including veterans (Currier, Holland, & Drescher, 2014; Elliot, Biddle, Hawthorne, Forbes, & Creamer, 2005) and female survivors of interpersonal violence (Stein, Dickstein, Schuster, Litz, & Resick, 2012).

One study examining CPT treatment response in a sample of female victims of interpersonal violence, found two distinct trajectories. One group (87%) was characterised by a reduction in PTSD symptoms and the second group (13%) was characterised by PTSD symptoms which did not significantly improve over time (Stein et al., 2012). Participants who received only a cognitive component of CPT or a written account component of CPT (compared to those who received full CPT), as well as individuals with major depression or severe hyper-arousal symptoms were more likely to be in the class which did not significantly improve over time (Stien et al., 2012). Another study examined treatment response, using a sample of 805 veterans who completed a residential programme for the treatment of PTSD symptoms. Three trajectories were identified: one group (48.8%) of participants demonstrated significant reductions in PTSD symptoms which were maintained at the follow up, the second group (41%) had high levels of PTSD which did not improve over time, and the third group (10.2%) had low levels of PTSD symptoms which remained stable over time (Currier et al., 2014). The findings also revealed that individuals who had symptoms which responded to treatment had

intermediate levels of symptom severity, mental and physical health and combat exposure when compared to individuals who had symptoms which did not respond to treatment (Currier et al., 2014). Consistent with this Elliot et al. (2005) revealed the existence of three trajectories within a treatment seeking veteran population. The studies mentioned above all show that there are distinct subgroups which differ in terms of levels and rates of treatment response. Identifying subgroups within CSA survivors would assist with treatment planning and it has been argued that this method could lead to treatment which is more tailored to the individuals given that survivors who may require more intensive or alternative therapy could be identified at an early stage (Elliot et al., 2005). More recently, Steine et al. (2017^a) examined post-traumatic symptom trajectories among adult CSA survivors who had attended a support centre (offering support including information and the opportunity to attend support groups). Two trajectories were identified: one was characterized by sub-clinical PTSD which decreased over time and another was characterized by clinical PTSD which only decreased slightly over time. This study also found that individuals in the clinical PTSD class had experienced more severe abuse, had higher levels of relationship difficulties and lower levels of perceived social support (Steine et al., 2017^a). The studies described above have highlighted that there are distinct unobservable subgroups relating to the longitudinal course of PTSD.

Taken together, the extant literature suggests that there are qualitatively distinct patterns of longitudinal PTSD. To the best of our knowledge this has not been examined among CSA survivors attending treatment. The current study aims to 1) Examine the changes in mean PTSD scores over the course of the treatment 2) identify differential PTSD trajectories. Based on previous research it was predicted that there would be an overall decrease in PTSD symptom scores. It was also predicted that there would be multiple and differing trajectories relating to treatment response.

6.2 Method

Participants

The sample used in the current study, is the same sample used in Chapter 5. The effective sample comprised 439 participants (after exclusions due to missing data). The majority of participants were female (85.8%) and all were Caucasian. The mean age of the sample was 36 years ($SD = 10.93$, range=15-77), the mean age that the abuse started was 6.62 years ($SD=4.26$) and the mean age at end of the abuse was 13.32 years ($SD=7.38$). The mean years spent in education was 13.44 ($SD=3.51$). Participants who had an active drug or alcohol problem, psychosis, a personality disorder characterised mainly by perpetrating traits, self-destructive behaviour or being in receipt of treatment elsewhere were excluded and were referred to another relevant agency where deemed appropriate.

Procedure (See Chapter 2 for a full description of the procedure)

All participants were outpatients at a treatment centre where they were offered free and unlimited weekly individual therapy sessions. There was no common treatment manual but a personality oriented approach to therapy based on the works of Theodore Millon (Millon, 1997) was utilised. During the second therapy session (T1), all participants attending completed a number of questionnaires. These questionnaires were repeated at six months (T2), 12 months (T3) and 18 months (T4). Continuous variables for the duration or number of treatment sessions

were not available, however only those who had been regularly participating in therapy received the assessments.

Measures

Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992).

In the current study PTSD symptoms were measured using part IV of the Danish version of the HTQ. This section consists of 30 items, the first 16 correspond to the PTSD symptoms in the DSM-IV (APA, 1994). Each item is scored on a 4 point Likert scale ranging from 'not at all' to 'all the time'. The first 16 items were added together giving a score ranging from 0-64. This score measured overall PTSD severity and was used to estimate the trajectories. When the mean score is used the standard cut off score for a probable PTSD diagnosis is 2.5 (e.g. Choi, Mericle, & Harachi, 2006). As the total score was used in the current analysis a cut of score of 40 indicated probable PTSD. Part IV of the HTQ has been validated in Denmark (Bach, 2003) and has been found to have good reliability and criterion validity (Mollica et al., 1992).

Missing data and attrition

Participants with over 20% of all baseline values missing were excluded from the analysis. Examination of HTQ items 1-16 showed that 99.05% of values were complete at baseline and Little's MCAR test suggested that the remaining missing baseline values were missing

completely at random ($\chi^2=3381.24$, 238, $p=0.18$). Out of the initial 439 participants at T1, 70.84% of participants completed T2, 44.43% completed T3 and 25.06% completed T4. All missing data was handled with multiple imputation. Multiple imputation replaces the missing scores with plausible estimations based on the values of observed variables, with standard errors taking the uncertainty of each value into account (Rubin, 1987). It is based on the assumption that the data is MCAR or missing at random (MAR). MAR refers to data missing which depends on observed variables but does not depend on unobserved variables (Little & Rubin, 2002). Biases associated with complete case analysis can be reduced if variables associated with the outcome variable and the missingness are used to estimate the missing scores (Sterne et al., 2009). In the current study 100 data sets were imputed in SPSS version 22 and these were then exported to Mplus 7.2 (Muthén & Muthén, 2014). The results were pooled based on Rubin's rules (Rubin, 1987). Importantly, the study described in Chapter 5 found no significant differences in HTQ baseline scores between participants who completed all four time points and participants who dropped out at an earlier stage. Therefore, it was deemed plausible to longitudinally estimate HTQ scores. A number of predictors of the longitudinal HTQ scores at T2, T3 and T4 were included in the imputation model (T1 HTQ scores, age, and social support at the time of the trauma). Education was found to predict missingness (and was identified as a predictor of length of time spent in treatment in Chapter 5).

Analytic plan

All analysis were conducted using Mplus 7.2 (Muthén & Muthén, 2014). A latent class growth analysis (LCGA) (Muthén, 2001, Nagin, 1999) was conducted using the overall HTQ scores

over 4 time points. LCGA is a type of finite mixture modelling, which divides a heterogeneous sample into a number of latent subgroups based on different growth trajectories. Traditional growth modelling assumes that all individuals follow one single growth trajectory with common parameters (Jung & Wickrama, 2008). Growth mixture modelling (such as LCGA) estimates multiple trajectories. This is appropriate when subsets trajectories exist which differ from the single estimate (Jung & Wickrama, 2008; Muthén & Asparaouhov, 2006). In LCGA the variance of latent slope and intercept are fixed to zero within classes, and are allowed to vary only between classes. As there is no covariance between the slope and intercept, and there are less parameters to estimate, it is easier for the model to converge (Nagin, 1999; Roeder, Lynch, & Nagin, 1999). This method has been used by other studies which have examined trajectories of PTSD treatment response (e.g. Currier et al., 2014). We tested class solutions comprising between one to six classes. Optimal model fit was determined using a variety of fit indices; the Bayesian information criterion (BIC), the Akaike information criterion (AIC) and the sample size adjusted Bayesian information criterion (Adjusted BIC). As multiple imputation was used the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT) and the bootstrapped likelihood ratio test (BLRT) were not available. It has been argued that the optimal group solution is characterised by the lowest BIC, adjusted BIC and AIC and a high classification accuracy, (the entropy value should be close to 1). There is evidence to suggest that the BIC performs best when deciding on the number of groups (Nylund, Asparoutiov, & Muthén, 2007). Having three time points, allows for the estimation of a linear pattern and four time points allows for the estimation of a quadratic term (Berlin, Parra, & Williams, 2014). The model was tested with both linear and quadratic terms. The robust maximum likelihood estimator was used. Maximum likelihood estimators are suitable for data that does not meet the assumption of normality (Satorra & Bentler, 1994; Yuan & Bentler, 2000) and have been found to be asymptotically efficient and consistent in large samples (Bollen, 1989).

6.3 Results

Examination of the mean scores revealed an overall reduction in PTSD symptoms over time. At T1 the mean PTSD score was 45.53 ($SD=8.07$), at T2 the mean score was 40.53 ($SD=9.46$), at T3 the mean score was 37.12 ($SD=10.84$), and at T4 the mean score was 34.77 ($SD=10.54$). LCGA was employed in order to examine PTSD trajectories. Linear and quadratic terms were estimated assuming 1-6 classes. The model fit improved with the addition of the quadratic term. The values for the fit indices of each model (with the quadratic term) are displayed in Table 6.1. Each time a class was added the results revealed an improvement in fit. When the 5th class was added the reductions in the fit indices were small suggesting that the addition of this class did not greatly improve the model. The BIC levelled off (there was an increase of 0.084) and although the Adjusted BIC and the AIC decreased, the reductions (12.609 and 16.253 respectively) were small. Therefore, based on the fit indices, theory and parsimony the 4 class solution was chosen.

Table 6.1: Fit indices for 1-6 class solutions

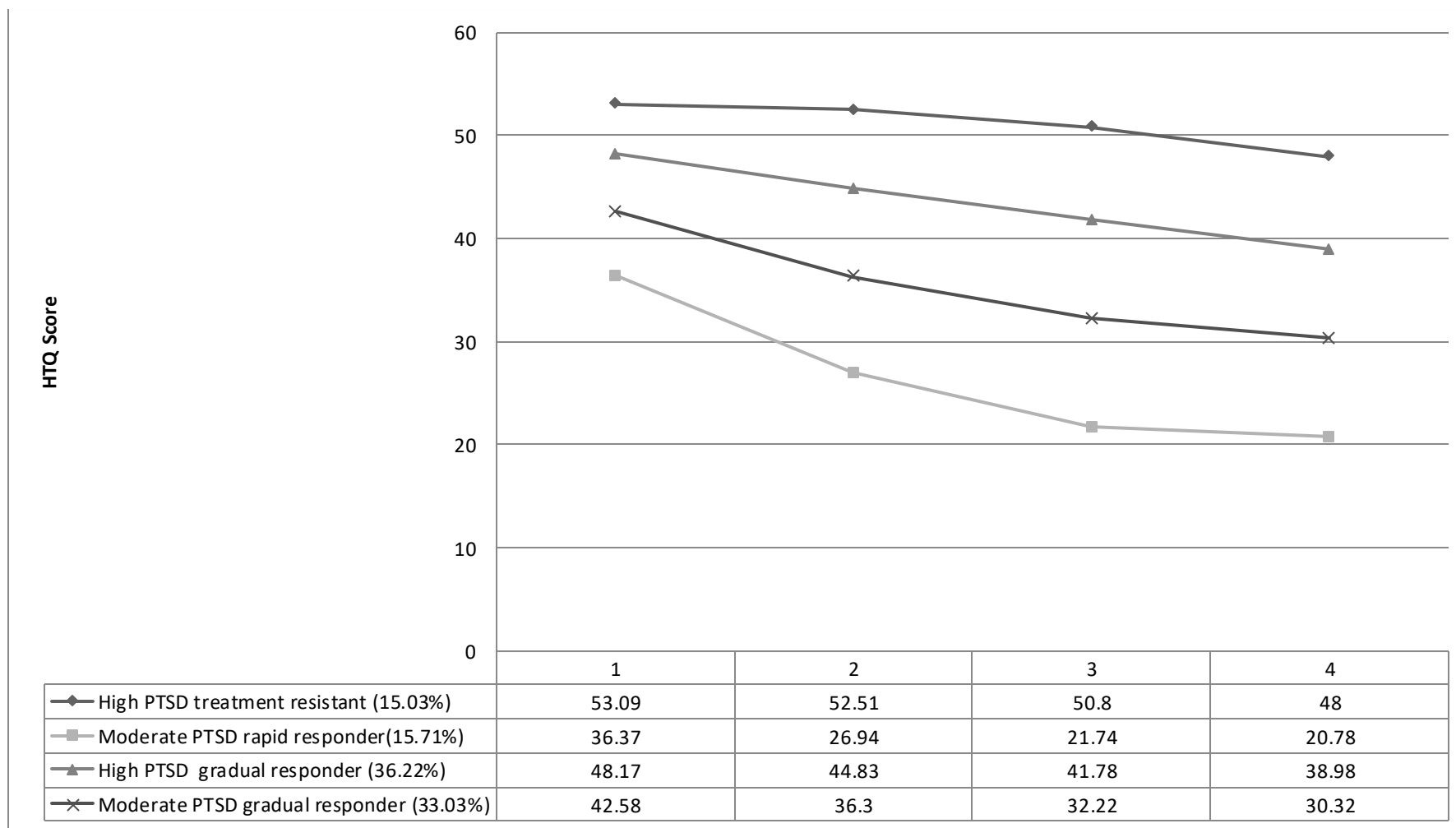
No. of classes	Entropy	BIC	Adjusted BIC	AIC
1	-	3238.507	3216.292	3209.916
2	0.815	2637.802	2602.893	2592.872
3	0.823	2459.844	2412.241	2398.576
4	0.777	2435.271	2374.974	2357.665
5	0.763	2435.355	2362.365	2341.412
6	0.744	2435.507	2349.822	2325.225

Note: BIC= Bayesian information criterion, AIC= Akaike information criterion

The LCGA trajectories are presented in Figure 6.1. The first trajectory ($n=65.98$, 15.03% based on most likely class membership) was labelled “High PTSD treatment resistant”. It was characterised by high clinical levels of PTSD at T1 which did not significantly change over time, the quadratic term was not significant for this class (Intercept =3.32, $SE=0.1$, $p<0.00$; Slope=-0.00, $SE=0.1$, $p>0.05$; Quadratic=-0.04, $SE=0.03$, $p>0.05$). This class experienced the smallest change in symptoms over time with only a decrease of 5.08 in HTQ score, clinical levels of PTSD remained even after 18 months of treatment. The second trajectory ($n=68.96$, 15.71% based on most likely class membership) was labelled “Moderate PTSD rapid response”. It was characterised by moderate subclinical levels of PTSD at T1 which significantly improved over time, the quadratic term was also significant (Intercept=2.27, $SE=0.18$, $p<0.00$; Slope=-0.72, $SE= 0.13$, $p<0.00$; Quadratic=0.13, $SE=0.04$, $p<0.00$). The largest improvement occurred between T1 and T2 (a decrease of 9.43 points) and after T2 the symptoms continued to improve but at a more gradual pace. Overall this group experienced the largest improvements in HTQ score (15.59 points). The third pattern ($n=159$, 36.22% based on most likely class membership) was labelled the “High PTSD gradual responder” class. Participants in this group had relatively high clinical levels of PTSD at T1 which significantly improved over time. At T4 the mean PTSD score was below the clinical cut off score. The quadratic term was not significant (Intercept= 3.01, $SE=0.15$, $p<0.00$; Slope=-0.22, $SE=0.12$, $p=0.05$; Quadratic=0.01, $SE=0.03$, $p>0.05$). The symptoms decreased in a linear fashion and there was an overall decrease of 9.21 points. Trajectory four ($n=145$, 33.03% based on most likely class membership) was labelled “Moderate PTSD gradual responder”. It was characterised by moderate but clinical levels of PTSD at T1 which significantly improved over time, the quadratic term was significant (Intercept=2.66, $SE= 0.10$, $p= <0.001$; Slope=-0.46,

$SE = 0.13$, $p < 0.001$; Quadratic = 0.07 , $SE = 0.03$; $p = < 0.05$). In this group the HTQ score decreased by 12.26.

Figure 6.1: PTSD treatment response trajectories



Note: Cut off score for probable PTSD diagnosis is >40

6.4 Discussion

Consistent with the extant literature the results revealed that overall PTSD scores decreased over the course of treatment (Taylor & Harvey, 2010). At the first assessment the mean PTSD score was over the cut off score for a probable PTSD diagnosis (Mean=45.53, $SD= 8.07$) and by T3 this had reduced to below the clinical cut off score (Mean=37.12, $SD=10.84$). The main aim of the current study was to identify whether all individuals followed a similar pattern or whether there were multiple PTSD trajectories. Understanding subgroups within this population has important implications for treatment planning. Examination of the mean HTQ scores did not reflect the four distinct subgroups within this population which were identified by applying LCGA. When utilising LCGA four trajectories were identified. This is consistent with the findings from studies within other treatment seeking trauma populations (Currier et al., 2014; Elliot et al., 2005; Stein et al., 2012) which have found distinct subgroups which vary in terms of PTSD severity and course. This finding highlights the importance of using methods to identify subgroups as opposed to methods which assume the sample is homogeneous.

The results revealed two classes with moderate PTSD at baseline and two classes with high PTSD at baseline. One trajectory (moderate PTSD gradual response; 33.03%) entailed moderate levels of clinical PTSD which steadily improved over a period of 18 months. The 'Moderate PTSD rapid response' class (15.71%) was characterised by a rapid improvement in symptoms within the first 6 months of treatment (9.43 points), this improvement continued but was more gradual over the remaining treatment period. Individuals within this class had the greatest improvement in PTSD symptoms (an overall improvement of 15.59 points). The identification of this trajectory was in line with a study by Elliot et al. (2005) examining PTSD trajectories in veterans attending treatment where a rapid responding class was also identified.

This suggests that the ‘Moderate PTSD rapid responder’ trajectory is not exclusive to CSA trauma populations. It may be that this subgroup does not require long term treatment as the majority of the improvement occurs within the earlier stages of the treatment. The identification of two groups with moderate PTSD that respond differently has not been found in previous studies. Results from the current study suggest that individuals with moderate PTSD at T1 are likely to have a significant improvement in symptoms however they may improve at differing rates. Future research should examine differences between these two groups in order to understand why one group responds better to treatment despite having similar baseline levels of PTSD.

Two groups with relatively high PTSD scores at baseline were also identified. The ‘High PTSD gradual response’ group (36.22%) was characterised by high clinical PTSD symptoms which decreased gradually to a non-clinical level over a period of 18 months (9.19 points overall decrease). This finding was similar to a class found in a sample of female victims of interpersonal violence, characterised by high PTSD at baseline, which were below the clinical cut off at the end of treatment (Stein et al., 2012). Although these results have suggested that CSA survivors with high PTSD at baseline can benefit from treatment, there was another class which showed no significant improvement in symptoms over time. The ‘High PTSD treatment resistant’ (15.03%) class did not appear to benefit from the treatment and over the period of 18 months. Within this class there was only a decrease in 5.9 points of the HTQ scale and the mean score was above the clinical cut off score even after 18 months of treatment. Treatment resistant trajectories have also been found in a sample of veterans attending inpatient PTSD treatment centres (Currier et al., 2014) and in a sample of female victims of interpersonal violence attending CPT treatment for PTSD (Stein et al., 2012). This finding highlights that

CSA survivors with high levels of clinical PTSD can respond differently to treatment. Understanding the differences between these classes is clinically imperative.

A possible explanation for the presence of multiple PTSD trajectories could be related to risk and protective factors which have found to explain variation in trauma related symptom course and severity. For example, positive coping mechanisms such as problem focused coping (Sigmon, Greene, Rohan, & Nichols, 1997) and high levels of social support (Charuvastra & Cloitre, 2008) have been found to be protective against psychopathology. In contrast, low social support (Brewin, Andrews, & Valentine, 2000), low education (Pedersen et al., 2008) and high levels of avoidant (Walsh, Fortier, & DiLillo, 2010) and emotional coping (Shapiro & Levendosky, 1999) have been found to be associated with increased negative outcomes among trauma survivors. In line with previous studies the study discussed in Chapter 5 found that higher levels of education, being female, having higher levels of perceived social support at the time of the abuse were associated with less severe symptom levels. The results also revealed that high levels of emotional coping predicted more severe symptom levels. It is possible that these factors could also explain variation in how PTSD symptoms change over the course of treatment. It is also possible that the levels of the individual PTSD symptom clusters could be related to the overall PTSD symptom severity. For example, one study found that high levels of hyper-arousal predicted membership in the non-responding class (Stein et al., 2012). It was argued that support regulating hyper-arousal symptoms could be provided before entering therapy. Consistent with this, Marshall, Schell, Glynn and Shetty (2006) found that arousal symptoms predicted both avoidance and re-experiencing symptom levels at a follow up assessment. In order to plan appropriate treatment, it is important that we understand the differences between the group that responds to treatment and the treatment resistant group.

Although examining risk and protective factors was beyond the remit of this study, future studies should examine predictors of PTSD treatment outcome trajectories in CSA survivors.

Overall, this study revealed four distinct trajectories suggesting that not all CSA survivors respond to treatment in the same way. It has also highlighted that the examination of changes in group means, is not sufficient for evaluating the effectiveness of treatment. The majority of participants in this sample did respond positively to treatment suggesting that attending personalised psychotherapy may be related to a reduction in PTSD symptoms, however a causal relationship cannot be concluded. Notably, 15.03% of participants did not experience a significant improvement in PTSD symptoms. These findings have important clinical implications. Individuals with higher levels of PTSD at baseline may be at an increased risk of not responding to treatment. Clinicians should assess this throughout treatment and if there is little improvement by 6 months it may be that a more intense or alternative therapy is required for this subgroup. PTSD severity at baseline and over the course of treatment may also be attributable to the fact that the members of the trajectories differ on important characteristics that confer risk or resilience to the development of long term PTSD symptomatology.

The findings of the current study should be interpreted in the light of several limitations. Firstly, this sample was predominately female (85.8%), treatment seeking and were all victims of CSA therefore the trajectories identified may not be generalizable to other trauma populations. Secondly, there have been recent changes to PTSD's diagnostic criteria (DSM-5: APA, 2013); future studies should utilise data reflecting these changes to determine if the results remain consistent. Thirdly, attrition rates were high within this sample. Attrition is a common problem within longitudinal studies (Spratt et al., 2010). Biases associated with case wise deletion can

be reduced by using methods such as multiple imputation for managing the missing data (Sterne et al., 2009). Although we attempted to reduce biases by using multiple imputation to estimate the missing values it is possible that the trajectories would have been very different without the missing data. Further, the missing data was estimated based on the assumption that the data was missing at random (MAR). This refers to missing data which depends on observed variables but does not depend on unobserved variables (Little & Rubin, 2002). A number of predictors of missingness and longitudinal HTQ scores at T2, T3 and T4 were included in the imputation model as an attempt to increase the plausibility of the MAR assumption. However, there was a lack of information about the treatment and therapist. It is possible that these factors could have influenced missingness, this would violate the MAR assumption and subsequently impact the conclusions which can be drawn from the findings. Finally, in this study there was no control group used. Therefore, we cannot conclude that the changes in symptoms were a result of the psychotherapy and it could be suggested that the changes in symptoms were due to the passage of time. Although some of the participants had recent experiences of sexual abuse, the majority of the CSA experiences were historical (the mean length of time since the abuse was 22.2 years, with a range of 1-61 years). It is therefore reasonable to suggest that many of the participants may have had chronic PTSD prior to attending treatment and that at least some of the changes in symptomology were due to the treatment and not only due to the natural progression of PTSD over time. Future studies examining PTSD trajectories comparing multiple types of therapy or using a waitlist control group will be important in order to examine the specificity of the findings in the current study.

Despite these limitations, the study had a number of important strengths. Firstly, the study was based on a relatively large multi centred clinical sample. Strengths of this design (as opposed to a randomised control trial) include increased ecological validity and generalizability. This

design is also associated with greater power (in relation to sample size and number of follow up assessments). Moreover, the findings have contributed to the literature by being the first study to identify differential PTSD treatment response trajectories in adult survivors of CSA. Future studies should examine treatment response trajectories in other trauma populations and examine factors which can potentially differentiate between trajectories. The latter will allow identification of factors which may place an individual into a highly symptomatic and treatment resistant trajectory when compared to a trajectory characterised by less severe PTSD and more positive treatment response.

Chapter 7: Predictors of PTSD treatment response trajectories in a sample of childhood sexual abuse survivors: The role of social support, coping and PTSD symptom clusters

A summary of this chapter in combination with Chapter 6 has been published in the *Journal of Interpersonal Violence*

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7.1 Introduction

Chapter 7 will address the final research objective by extending on the work described in Chapter 6. A logistic regression will be conducted in order to examine whether social support, coping style or individual posttraumatic stress disorder (PTSD) symptom clusters are predictive of PTSD treatment response trajectory membership. Firstly, the introduction will provide an overview of the findings from Chapter 6 and discuss the importance of identifying risk and protective factors associated with treatment outcomes. Secondly, the literature relating to the roles of social support, coping style, and individual PTSD symptom clusters in explaining variation in psychological and treatment outcomes among trauma survivors will be discussed.

The primary aim of Chapter 6 was to examine whether there were multiple trajectories of PTSD treatment response. Previous studies have examined PTSD treatment response trajectories among other trauma populations such as victims of interpersonal violence (Stein, Dickstein, Schuster, Litz, & Resick, 2012) attending cognitive processing therapy and veterans attending residential treatment (Currier, Holland, & Drescher, 2014). There has also been one previous study which has examined PTSD trajectories among CSA survivors (not specifically attending treatment; Steine et al., 2017^a). The study described in Chapter 6 was the first known study to examine PTSD trajectories among CSA survivors attending treatment. As predicted the results indicated the presence of qualitatively distinct trajectories. Four trajectories were revealed:

High PTSD gradual responder (36.32%), high PTSD treatment resistant (15.03%), moderate PTSD rapid responder (15.71%), and moderate PTSD gradual responder (33.03%). These results indicated the presence of distinct, unobservable subgroups relating to the longitudinal course of PTSD within the current population. Understanding the differences between the individuals who respond to treatment and those who do not, is clinically imperative. It is

possible that by examining predictors of trajectory membership that modifiable risk and protective factors could be identified. These factors could subsequently be targeted during early intervention or treatment programmes. Consistent with the other studies (Chapter 4 and 5) within this thesis the current study will examine the role of social support and coping. Evidence from previous studies (e.g. Stein et al., 2012) suggests that specific PTSD symptom clusters such as hyper-arousal can predict overall PTSD severity and thus should be prioritised in treatment. As this has not yet been examined in relation to PTSD treatment response trajectories among CSA survivors this will also be addressed in the present study.

Coping style has been found to explain variation in PTSD severity and longitudinal course (e.g. Elklit, 2015; Karstoft, Armour, Elklit, & Solomon, 2015) among trauma survivors. Studies have consistently shown that emotion focused coping (which aims to reduce internal stress without modifying the external reality; Lazarus & Folkman, 1984) and avoidance coping (associated with avoiding thoughts and emotions related to the trauma) are associated with an increased risk for experiencing severe and chronic PTSD (e.g. Karstoft et al., 2015). One recent longitudinal study identified four PTSD trajectories among 675 Israeli soldiers (labelled recovery, resilience, delayed onset and chronicity; Karstoft et al., 2015). The results indicated that less use of emotional coping in veterans was associated with lower odds of being in the chronic PTSD trajectory (Karstoft et al., 2015). The authors suggested that coping not only plays a role in symptom development but it is also associated with symptom maintenance (Karstoft et al., 2015). Furthermore, studies in samples of CSA survivors have found that emotion focused coping predicts more severe PTSD (Elklit, 2015; Sigmon et al., 1997) even after abuse severity and duration have been controlled for in analyses (Shapiro & Levendosky, 1999). Consistent with these findings the study described in Chapter 4 indicated that emotional coping was associated with more severe co-occurring depressive disorders, anxiety, and PTSD

and somatoform disorder within the current sample. Avoidance coping (including disengagement, self-distraction, alcohol and drug use, and denial) has also been found to be related to more severe PTSD symptomology (Coffey, Leitenberg, Henning, Turner, & Bennett, 1996; Steel, Sanna, Hammond, Whipple, & Cross, 2004). Silver, Holman, McIntosh, Poulin and Gil-Rivas (2002) examined PTSD in a national sample of adults assessed after 9/11/2001 and findings revealed that avoidance coping soon after the trauma predicted more severe PTSD symptomology six months later. Consistent with this, a review of 39 studies, examining adult coping in CSA survivors concluded that long term avoidant coping was related to increased distress (Walsh, Fortier, & DiLillo, 2010).

It has been suggested that emotional or avoidant coping maintains PTSD symptomology as it does not allow the trauma memories to be effectively processed (Ehlers & Clark, 2000). In contrast to the maladaptive nature of avoidant and emotion focused coping, rational or problem focused coping (characterised by directly addressing the problem and attempting to reduce external stress; Lazarus & Folkman, 1984) has been found to be associated with less severe PTSD symptoms (Ménard & Arter, 2013). The study by Karstoft et al. (2015) also found that veterans who had higher levels of problem solving coping had decreased odds of membership in both the chronic and worsening PTSD classes. Problem focused coping has also been found to be associated with less psychological distress in adult CSA survivors (Coffey et al., 1996). The evidence above suggests that emotional and avoidant coping styles are associated with PTSD whereas rational coping has been found to be protective. Individuals who employ problem focused coping methods may be more able to process trauma related emotions (Ehlers & Clark, 2000). Coping style has not yet been examined as a predictor of PTSD treatment response trajectories among CSA survivors. It is possible that individuals with high levels of maladaptive coping styles (such as avoidant or emotional coping) may not be able to process

the trauma memories and may be more likely to be in the treatment resistant class. This will be examined in the current study.

Social support is another factor which has consistently been found to influence the development and maintenance of PTSD (Brewin, Andrews, & Valentine, 2000; Feder et al., 2016; Karstoft, Armour, Elklit, & Solomon, 2013; Ozer, Best, Lipsey, & Weiss, 2003). Higher social support has been found to predict low and no symptom longitudinal trajectories in individuals who were assessed following 9/11/2001 (Feder et al., 2016). Furthermore, studies in CSA populations have identified social support as a protective factor (Elklit, 2015; Tremblay, Hebert, & Piche, 1999) and it has been found to be associated with PTSD recovery among veterans (Karstoft et al., 2013; Koenen et al., 2003) and CSA survivors (Steine et al., 2017^a). Within the current sample social support at the time of the abuse was found to be associated with lower odds of membership in the high disorder class (see Chapter 4). One recent study examined post-traumatic symptom trajectories among adult CSA survivors who had attended a support centre (but not specifically attending treatment; Steine et al., 2017^a). The study identified two PTSD trajectories: one characterised by sub-clinical PTSD which improved over time and another was characterized by clinical PTSD which only improved slightly over time. The study also found that individuals in the clinical PTSD class had lower perceived social support and increased relationship difficulties (Steine et al., 2017^a). Taken together the literature suggests that social support is associated with lower psychopathology (including PTSD) as well as recovery among veteran and sexual abuse survivors. As previously discussed there are a number of potential explanations for the link between social support and lower trauma related symptomology and recovery. It has been suggested that social support buffers against the stressful event thus protects against maladaptive and risky behaviour and psychological symptom development (Cohen & Wills, 1985). It has been suggested that

positive social support influences the cognitive evaluation of the traumatic event and this in turn can reduce the stress reaction (Tremblay et al., 1999). Consistent with this theory, Spaccarelli and Kim (1995) found that parental support was associated with less severe psychopathology, stress and negative views in female CSA survivors. In contrast it has been suggested that PTSD symptoms can negatively impacts relationships which can subsequently lead to lower levels of social support (Campbell & Renshaw, 2013). Taken together, the evidence suggests a strong association between social support and trauma related symptomology. The underlying mechanisms however are not well understood.

PTSD symptom clusters

PTSD was originally characterised by three symptom clusters: Avoidance and numbing, re-experiencing and hyper-arousal (APA, 2000). Recently there has been the addition of a fourth symptom cluster: negative alterations in cognition and mood (DSM 5; APA, 2013). There is evidence to suggest that individual PTSD symptom clusters can predict overall PTSD severity. However there have been some notable inconsistencies in the literature. For example Schell, Marshall, and Jaycox (2004) found that arousal symptoms predicted severity of all other symptoms at three and 12 month assessments. Stein et al. (2012) also found that hyper-arousal symptoms predicted the trajectory with the least improvement in a sample of survivors of interpersonal violence. The authors suggested that the arousal symptoms are distracting and that this could interfere with treatment engagement (Stein et al, 2012). There are also studies which have suggested that re-experiencing symptoms are the most clinically relevant (Creamer, Burgess, & Pattison, 1992). It has been postulated that high levels of re-experiencing and hyper-arousal reinforce the learning that occurred during the traumatic experience and

therefore contribute to the development and maintenance of PTSD (Shalev, 2002). In contrast to the findings discussed above other studies have suggested that avoidance and numbing predict overall PTSD (Hyland et al., 2016). It has been argued that avoidance is employed as an attempt to reduce the stress associated with hyper-arousal and re-experiencing, however, long-term it maintains the PTSD as it interferes with the processing of trauma memories (Clark & Beck, 2010). Overall the results with regards to PTSD symptom clusters and PTSD severity and course have been inconsistent and further research is warranted. Further, understanding of which symptoms are important in predicting treatment response would have important theoretical and clinical implications. For example if one particular symptom cluster was found to predict treatment resistance it may suggest that this symptom should be a priority during treatment.

Taken together, the extant literature suggests that coping, social support and PTSD symptoms clusters are important predictors of long-term PTSD course and severity. To the best of our knowledge these factors have not been examined as predictors of PTSD treatment response trajectories among CSA survivors. The current study aims to examine the above factors as predictors of previously identified trajectories. Based on the evidence, it was predicted that emotional coping would be associated with the treatment resistant trajectory and social support and rational coping would be associated with treatment response. No specific predictions were made with respect to PTSD symptom clusters. Finally, trauma characteristics (e.g. Steine et al., 2017^a) and demographic factors (e.g. Ullman & Filipas, 2005) have been found to influence PTSD symptomology. Therefore the current study will also include the number of cumulative traumas, the length of time since the trauma occurred, as well as age, sex and education in the analysis.

7.2 Method

Participants

The sample ($N=439$) in the current study was the same as the sample used in Chapters 4 and 5. For a detailed description of the participants refer to Chapter 2.

Procedure

For a detailed description refer to Chapter 2. All participants were attending personalised psychotherapy which was conducted by psychologists. Assessments were conducted during the second therapy session (T1) and at 6 monthly intervals over a period of 18 months. All predictors were collected at T1. The trajectories were previously estimated using all four time points.

Measures (Refer to Chapter 2 for a detailed description)

Demographics

The following socio-demographic characteristics were included in the current analysis: total years of education, sex (female reference group) and age (continuous measure in years).

Trauma characteristics

Participants were also asked about other traumas they had experienced including rape, physical assault, life threatening accident, fire, flood or natural disaster, physical abuse as a child, neglect as a child, witnessing another person being seriously injured or killed or being threatened, held captive or kidnapped. Each question had a yes or no response option. Within this study a dichotomous variable indicating whether or not the participant had experienced another traumatic event was created. Individuals were also asked the length of time in years since the end of the abuse (a continuous variable measured in years).

Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992)

PTSD symptoms clusters were measured using part IV of the Danish HTQ. This section is comprised of 30 items, the first 16 of which correspond to the PTSD symptoms in the DSM-IV (APA, 1994). Three subscales: hyper-arousal, re-experiencing and avoidance were utilised in the current study. Each item is scored on a 4 point Likert scale ranging from 'not at all' to 'all the time'. Part IV of the HTQ has been validated in Denmark (Bach, 2003) and has been found to have good reliability and criterion validity (Mollica et al, 1992). In the present study, the Cronbach's alpha coefficients for the arousal, re-experiencing and avoidance subscales ranged from 0.64-0.82.

The Coping Styles Questionnaire (CSQ; Roger, Jarvis, & Najarian, 1993)

The CSQ was used to measure coping strategies employed by the participants. The version used in the current study has 37 items. All items are scored on a 4 point Likert scale ranging from 'never' to 'always'. Research has confirmed the presence of four clusters (Elklit, 1996). These are emotional, avoidance, rational and detached coping. O'Connor & Elklit, (2008)

reported the following Cronbach's alpha coefficients; rational= 0.7, emotional=0.75, avoidance 0.65, detached =0.43. The current study revealed Cronbach's alpha coefficients ranging between 0.65 and 0.85.

Crisis Support Scale (CSS; Joseph, Andrews, Williams, & Yule, 1992)

The CSS was used to measure perceived social support both during the time of the trauma and at baseline. There are 7 items, each of which is measured on a 7 point Likert scale ranging from 'never' to 'always'. Research has shown that the scale has good internal consistency (Cronbach's alphas range between 0.67 and 0.82) and good discriminatory power (Elklit, Pedersen, & Jind, 2001). All 7 items were summed together to give a total score ranging between 7 and 49.

PTSD treatment response trajectories

For a full description refer to Chapter 6. The initial trajectories were identified using the total scores of the first 16 HTQ items over 4 time points. LCGA revealed four trajectories which were labelled: moderate PTSD gradual response, moderate PTSD rapid response, high PTSD gradual response and high PTSD treatment resistant.

Missing data and attrition

Firstly participants with over 20% of all baseline values missing were excluded from the analysis. Examination of all baseline items demonstrated that 98% of cases were complete. Due to the small amount of missing data on all predictors we imputed values using the Expectation Maximisation algorithm in SPSS version 22. Little's (1988) missing completely at random (MCAR) test suggested that the missing baseline values were MCAR ($\chi^2=7424.65$, $df= 7322$, $p=0.198$). Out of the initial 439 participants at T1, 70.84% of participants completed T2, 44.43% completed T3 and 25.06% completed T4. The previously identified trajectories were estimated using multiple imputation (see Chapter 6).

Analytic plan

Following the imputation of missing data in SPSS data were exported to Mplus version 7.3 (Muthén & Muthén, 2014). A logistic regression was performed to examine predictors of class membership using the three step approach (R3STEP function; Asparouhov & Muthén, 2013; Vermunt, 2010). We included age, sex, education, number of traumas, length of time since the sexual abuse, coping styles (detached, rational, emotional and avoidant), PTSD symptom clusters (hyper-arousal, avoidance and re-experiencing) and social support (at T1 and at the time of the abuse) in the analysis. As mentioned in Chapter 4, there are a number of methods which can be used to examine predictors of latent classes. A regression and a latent class analysis can be combined in one step (by including predictor variables in the initial analysis), however the resulting classes will be based on the predictors as opposed to only the latent class indicators. This can lead to the classes losing their meaning (Asparouhov & Muthén, 2013). Another method involves conducting the initial latent class analysis and categorising participants based on most likely class membership. This method however can have levels of

classification error particularly when the entropy rate is low. The automatic three step approach however (R3STEP), estimates the latent class model using only the required indicators and accounts for error when categorising participants. Following this first step a variable *S* (most likely class membership) is created, this is based on the latent class posterior distribution (obtaining during step one), the classification uncertainty rate is also taken into account. In the final step the most likely class variable (which includes measurement error) is used as the dependant variable in a regression analysis (Asparouhov & Muthén, 2013; Vermunt, 2010). This method was conducted in the current study. Consistent with all other studies within this thesis the robust maximum likelihood (MLR) estimator was used.

7.3 Results

The demographic characteristics of the full sample and for each individual class can be found in Table 7.1. The odds ratios and 95% confidence intervals for predictors of the trajectories are presented in Table 7.2. A logistic regression using the R3STEP approach was conducted to examine predictors of class membership. All classes were compared to each other as opposed to only using one reference class.

We conducted a logistic regression using the three step approach to examine predictors of class membership. The results revealed that higher social support at T1 ($OR=0.81$, 95% CI : 0.74-0.88) and a longer time period since the abuse occurred ($OR=0.93$, 95% CI : 0.87-0.98) was associated with a decrease in odds of being in the treatment resistant class when compared to the moderate PTSD gradual response class. Whereas increased levels of re-experiencing symptoms ($OR=1.85$, 95% CI : 1.36-2.49), avoidance symptoms ($OR=1.49$, 95% CI : 1.2-1.84),

arousal symptoms ($OR=1.38$, 95% CI : 1.01-1.87) and emotion focused coping ($OR=1.22$, 95% CI : 1.02-1.46) were associated with increased odds of being in the treatment resistant class.

When the moderate PTSD rapid response class was compared to the moderate PTSD gradual response class increased social support at T1 ($OR=1.1$, 95% CI : 1.01-1.21) and older age ($OR=1.63$, 95% CI : 1.09-2.42) was associated with an increase in odds of being in the rapid response class. A longer length of time since the abuse occurred was associated with a decrease in odds of membership in the rapid response class ($OR=0.93$, 95% CI : 0.89-0.97). The odds of being in the high PTSD gradual responder compared to moderate PTSD gradual responder were decreased by being female ($OR=0.33$, 95% CI : 0.12-0.87), having higher social support ($OR=0.91$, 95% CI : 0.85-0.97) and a having a longer period time since the abuse occurred ($OR=0.95$, 95% CI : 0.9-0.99). The odds of being in the high class were increased with higher levels of re-experiencing ($OR=1.34$, 95% CI : 1.1-1.63) and avoidance symptoms at T1 ($OR=1.22$, 95% CI : 1.01-1.45). Odds of being in the high PTSD non-responder class when compared to the high PTSD moderate responder were increased with higher re-experiencing symptoms ($OR=1.37$, 95% CI : 1.03-1.81) and avoidance symptoms ($OR=1.23$, 95% CI : 1.03-1.45) and decreased with higher levels of social support ($OR=0.89$, 95% CI : 0.82-0.96).

When the moderate PTSD rapid response class was compared to the high PTSD gradual response class, odds of being in the moderate class increased with higher levels of social support ($OR=1.21$, 95% CI : 1.09-1.34) and decreased with higher re-experiencing ($OR=0.64$, 95% CI : 0.49-0.83), avoidance symptoms ($OR=0.72$, 95% CI : 0.57-0.91) and higher levels of emotional coping ($OR=0.82$, 95% CI : 0.72-0.94).

Finally odds of being in the treatment resistant class decreased with higher levels of social support ($OR=0.73$, 95% CI : 0.65-0.83) and increased with higher re-experiencing ($OR=2.15$, 95% CI : 1.5-3.1), avoidance ($OR=1.71$, 95% CI : 1.31-2.24) and hyper-arousal symptoms ($OR=1.42$, 95% CI : 1.02-1.96) and higher levels of emotion focused ($OR=1.37$, 95% CI : 1.11-1.68) and detached coping ($OR=1.52$, 95% CI :1.02-2.27) when compared to the moderate PTSD rapid responding group.

Table 7.1: Demographics and descriptive statistics for the full sample and for each trajectory

Variable	Full sample	Class 1	Class 2	Class 3	Class 4
	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)	Mean (<i>SD</i>)
Female <i>N</i> (%)	376 (85.8)	65 (95.6)	66 (93)	110 (19.7)	135 (83.3)
Other trauma <i>N</i> (%)	372 (84.7)	60 (90.9)	50 (72.4)	143 (89.9)	119 (82.1)
Education	13.44 (3.51)	12.43 (3.59)	14.01 (3.27)	12.99 (3.49)	14.01 (3.48)
Age	36.46 (10.83)	38.59 (11.52)	33.37 (8.87)	37 (11.67)	36.46 (10.37)
Social support ¹	11.97 (6.21)	9.56 (3.13)	12.67 (7.71)	11.38 (5)	13.3 (7.11)
Social support ²	30.13 (7.45)	24.76 (6.42)	35.01 (6.87)	28.45 (7.11)	31.74 (6.52)
Coping Rational	24.21 (4.94)	23.43 (4.91)	25.33 (5.04)	23.41 (5)	24.72 (4.73)
Emotional	24.80 (5.82)	28.65 (4.89)	20.46 (4.76)	26.89 (5.39)	23.51 (5.3)
Detached	10.91 (2.82)	10.35 (2.57)	10.64 (2.72)	10.59 (2.72)	11.54 (2.95)
Avoidant	21.68 (4.24)	22.26 (4.34)	19.95 (4.13)	22.42 (4.17)	21.57 (4.12)
Re-experiencing	10.44 (2.84)	12.98 (2.22)	8.56 (2.59)	10.97 (2.51)	9.73 (2.56)
Avoidance	19.51 (4.09)	22.79 (2.47)	15.35 (3.92)	12.19 (3.36)	18.53 (3.34)
Hyper-arousal	15.47 (2.94)	17.68 (1.6)	13.12 (3.5)	21.19 (2.24)	14.86 (2.72)

Length of time since	22.2 (11.69)	20.61 (13.21)	21.28 (9.5)	22.11 (11.78)	25.29 (1.48)
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abuse

Note: Class 1=high PTSD treatment resistant, Class 2=moderate PTSD rapid response, Class 3=high PTSD gradual responder, Class 4=Moderate PTSD gradual respond. ¹= During trauma ²=at baseline

Table 7.2: Odds ratios (95% Confidence intervals) for predictors of PTSD treatment response trajectories

Predictor	Class 1 vs. Class 4	Class 2 vs. Class 4	Class 3 vs. Class 4	Class 1 vs. Class 3	Class 2 vs. Class 3	Class 1 vs. Class 2
	<i>OR (95% CI)</i>	<i>OR (95% CI)</i>	<i>OR (95% CI)</i>	<i>OR (95% CI)</i>	<i>OR (95% CI)</i>	<i>OR (95% CI)</i>
Time since trauma	0.93 (0.87-0.98)*	0.93 (0.89-0.97)*	0.95 (0.9-0.99)*	0.98 (0.9-1.03)	0.99 (0.9-1.04)	0.99 (0.93-1.06)
Female	0.51 (0.07-3.59)	0.99 (0.18-5.29)	0.33 (0.12-0.87)*	1.55 (0.21-11.02)	3.02 (0.57-15.77)	0.51 (0.04-5.76)
Education	0.93 (0.8-1.08)	0.89 (0.75-1.06)	0.94 (0.58-1.05)	0.99 (0.85-1.14)	0.94 (0.78-1.36)	1.05 (0.83-1.3)
Social support ¹	0.9 (0.72-1.11)	0.95 (0.87-1.04)	0.97 (0.91-1.03)	0.93 (0.74-1.16)	0.98 (0.89-1.08)	0.95 (0.75-1.18)
Social support ²	0.81 (0.74-0.88)***	1.1 (1.01-1.21)*	0.91 (0.85-0.97)**	0.89 (0.82-0.96)*	1.21 (1.09-1.34)***	0.73 (0.65-0.83)***
Re-experiencing	1.85 (1.36-2.49)***	0.86 (0.68-1.07)	1.34 (1.11-1.63)**	1.37 (1.03-1.81)*	0.64 (0.49-0.83)**	2.15 (1.5-3.1)***
Hyper-arousal	1.38 (1.01-1.87)*	0.97 (0.83-1.13)	1.13 (0.96-1.33)	1.22 (0.9-1.64)	0.86 (0.71-1.05)	1.42 (1.02-1.96)**
Avoidance	1.49 (1.2-1.84)***	0.87 (0.71-1.06)	1.22 (1.01-1.45)*	1.23 (1.03-1.45)*	0.72 (0.57-0.91)**	1.71 (1.31-2.24)***
Coping R	0.96 (0.81-1.12)	0.97 (0.87-1.08)	1.05 (0.95-1.15)	0.91 (0.77-1.07)	0.93 (0.81-1.06)	0.98 (0.81-1.18)
Coping E	1.22 (1.02-1.46)*	0.89 (0.79-1.01)	1.09 (0.98-1.19)	1.13 (0.94-1.34)	0.82 (0.72-0.94)**	1.37 (1.11-1.68)**
Coping D	1.28 (0.89-1.8)	0.84 (0.67-1.04)	1 (0.93-1.2)	1.28 (0.88-1.85)	0.84 (0.65-1.08)	1.52 (1.02-2.27)*

Coping A	0.83 (0.67-1)	0.98 (0.83-1.14)	0.95 (0.85-1.05)	0.87 (0.71-1.05)	1.03 (0.88-1.21)	0.84 (0.66-1.06)
Age	1.32 (0.78-2.26)	1.63 (1.09-2.42)*	1.23 (0.91-1.66)	1.07 (0.63-1.81)	1.31 (0.86-2.02)	0.81 (0.43-1.51)
Other trauma	0.63 (0.135-2.9)	0.63 (0.24-1.64)	1.43 (0.32-6.35)	0.44 (0.12-1.58)	0.44 (0.09-2.07)	0.98 (0.19-5.1)

Note: Class 1= high PTSD treatment resistant, Class 2=moderate PTSD rapid response, Class 3=high PTSD gradual responder, Class 4=Moderate PTSD gradual respond, R=rational, E=emotional, D=detached, A=avoidant, ¹= During trauma, ²= at T1

7.4 Discussion

The current study aimed to examine the roles of social support, coping and PTSD symptom clusters as predictors of previously identified PTSD treatment response trajectories. The extant literature has consistently demonstrated that emotion focused coping is a risk factor for the development and maintenance of PTSD (e.g. Benotsch et al., 2000; Karstoft et al., 2015). The study described in Chapter 4 also revealed that emotional coping predicts more severe psychopathology (including PTSD) in the current sample. Consistent with these findings the present study revealed that higher levels of emotional coping predicted membership in the treatment resistant class when compared to both moderate PTSD response classes and the high PTSD gradual responder when compared to the moderate PTSD rapid response class. This suggests that emotional coping is associated with more severe pre-treatment PTSD as well as chronic PTSD which may not respond to treatment. This finding highlights the long-term maladaptive nature of emotion focused coping. It has been suggested that emotional coping can be adaptive in the short term (Briere & Runtz, 2002). For example, during a traumatic event such as CSA problem focused coping (e.g. resistance) may lead to increased aggression from the perpetrator whereas emotional coping would reduce the immediate distress for the victim (Spaccarelli, 1994). However, if this coping style is maintained it can have harmful long term effects. It is thought that it can interfere with the processing of the trauma memories and subsequently maintain PTSD (Briere & Runtz, 2002; Ehlers & Clark, 2000). Interestingly, the results also revealed that detached coping was associated with membership in the treatment resistant class when compared to the moderate rapid response class. This suggests that feelings of being independent from the trauma can also have a long term negative impact. This finding is contrary to the view that detached coping is an adaptive response to stress (Roger et al., 1993). It is however possible that feeling detached from the traumatic event prevents the

processing of the traumatic memories in a similar way to emotion focused coping (Ehlers & Clark, 2000). Detached coping may also be related to dissociation (described as a disruption in memory, perception, consciousness or identify; APA, 2000). In line with the current findings Brand and Stadnik (2013) found that high levels of dissociation were related to higher general distress and PTSD symptoms in a sample of adults attending treatment for dissociative disorders. Notably, rational and avoidant coping were not associated with PTSD recovery as expected. It is possible that the inconsistencies in the findings are due to the measurements used. Although these results require further investigation, they have some important clinical implications. Firstly, individuals with high levels of emotional and detached coping styles should be considered as having an increased risk of severe PTSD which does not respond to psychotherapy. Secondly, it is possible that reducing emotion focused and detached coping and teaching a more adaptive coping style would allow effective processing of the trauma memories and potentially reduce PTSD symptoms, thus improving outcomes for CSA survivors.

The results in the present study also concurred with previous literature which has consistently evidenced the protective nature of social support in relation to PTSD (Brewin et al., 2000; Ozer et al., 2003). Steine et al. (2017^a) found that lower perceived social support and higher relationship problems predicted membership in a higher PTSD trajectory among CSA survivors. Additionally, Karstoft et al. (2013) found that social support was associated with decreased odds of membership in both the recovery and chronic trajectories among veterans. The authors suggested that social support may explain the initial high levels of PTSD within both of these trajectories but the improvement of symptoms may have been related to other factors (Karstoft et al., 2013). Interestingly, the study described in Chapter 4 found that current social support did not predict psychopathology but social support at the time of the abuse was associated with decreased odds of membership in a class characterised by high

psychopathology (including PTSD). In contrast, the current study found that social support at the time of the abuse did not predict trajectory membership, social support (at T1) was associated, with reduced odds of being in the high PTSD treatment resistant class when compared to the both moderate PTSD classes. Further, when both high PTSD classes were compared, social support was associated with treatment response and when both moderate classes were compared it was associated with a more rapid improvement in symptoms.

These results suggest that current social support is associated with less severe PTSD. Further, individuals with severe PTSD and greater social support are more likely to respond to treatment and individuals with moderate PTSD and greater social support are more likely to respond to treatment at a faster rate. Our findings lend support to the stress buffering theory which posits that social support improves stress regulation by influencing subjective appraisal and both internal and external stress responses (Cohen & Wills, 1985). In line with this theory, social support has been found to increase healthy behaviours and decrease risky behaviours (Holahan, Moos, Holahan, & Brennan, 1995). Moreover, it has been found to be associated with higher self-worth, and a sense of purpose, which has been thought to increase motivation for more positive self-care (Southwick & Charney, 2012). Trauma related social support has also been found to be predictive of building early therapeutic alliance (Keller, Zoellner, & Feeny, 2010) which may contribute to positive treatment outcomes.

Another explanation for the association between PTSD severity and low social support in the current study could be due to the negative impact that PTSD symptomology can have on relationships (Campbell & Renshaw, 2013). Indeed there is evidence suggesting that both of these processes may occur at different times, for example one study found that social support

was protective against PTSD in the short term but more severe PTSD increased the risk of having lower long-term social support (Kaniasty & Norris, 2008). In 2015, Freedman et al. examined the simultaneous progression of PTSD and social support among trauma exposed individuals. The results indicated that poor social relationships may lead to more severe PTSD rather than the reverse. The study also suggested that positive social relationships enhance natural recovery. Moreover the results suggested that social relationships improved over the course of treatment. Within the current study social support over the four time points was not examined which makes it difficult to disentangle the relationship. Further studies are required in order to increase understanding of the mechanisms underlying this association. If social support influences PTSD severity and course, it is possible that targeting social skills during treatment could also improve outcomes for CSA survivors. In line with this, previous research has demonstrated the effectiveness of social skills interventions. For example, a review of over 100 studies examining the outcomes of interventions focusing on social and behavioural skills found that 83% of the studies evidenced positive effects such as decreased psychological distress (Hogan, Linden, & Najarian, 2002).

Previous research examining the role of symptoms clusters in overall PTSD severity has shown conflicting results. Some studies have highlighted the importance of hyper-arousal symptoms (Stein et al., 2012) and others have evidenced the importance of avoidance (Hyland et al., 2016) or re-experiencing symptoms (Creamer et al., 1992). When examining the role of symptoms clusters the results revealed that higher levels of re-experiencing, avoidance and hyper-arousal predicted membership in the treatment resistant class when compared to the moderate PTSD treatment response class. This finding suggests that individuals with higher levels of overall PTSD are less likely to improve over the course of treatment. Of note, no individual symptoms were predictive of class membership when both moderate classes were compared suggesting

that no individual symptom should take priority among individuals with moderate levels of PTSD. However, when both high classes were compared membership in the treatment resistance trajectory was predicted by more severe re-experiencing and avoidance. This finding suggests that these symptoms may be a priority among individuals with higher levels of PTSD. Emotional processing theories suggest that avoidance is an attempt to reduce distressing symptoms and it has been argued that this prevents effective processing of traumatic memory and therefore maintains PTSD (Foa, Steketee, & Rothbaum, 1989). Moreover, Kleim, Ehlers, and Glucksman (2007) found that re-experiencing symptoms were an early predictor of later PTSD severity and studies have suggested that specifically targeting flashbacks in treatment led to higher rates of PTSD improvement (Nijdam, Baas, Olf, & Gersons, 2013). It has been suggested that high levels of re-experiencing reinforce the learning that occurred during the traumatic experience. This contributes to the development and maintenance of PTSD (Shalev, 2002). It is possible that the individuals in the treatment resistant trajectory have PTSD which is maintained by the presence of high re-experiencing symptoms which continue to reinforce the learning that occurred during the trauma. However, due to the presence of avoidance symptoms individuals are not able to effectively process these traumatic memories. Clinicians should be aware of these findings and re-experiencing and avoidance symptoms should be specifically targeted among individuals with severe PTSD as this may potentially improve overall PTSD outcomes. Further research on the role of symptoms clusters should be conducted as this could have important theoretical and clinical implications for trauma survivors with PTSD.

In relation to abuse characteristics the study found that experiencing additional trauma was not predictive of trajectory membership, this is contrary to other studies which have suggested that childhood cumulative trauma predicts more severe PTSD among CSA survivors (Steine et al.,

2017^b). In the current study the traumas included were not confined to childhood. It is possible that the results may have been different if childhood and adulthood traumas had been examined separately. The length of time since the abuse occurred was associated with class membership. Specifically, increased time since the abuse was associated with membership in the Moderate PTSD gradual response class when compared to all other classes. This contrasts with the results of another recent study which found that the time since the trauma occurred was not predictive of treatment outcomes (Murray, El-Leithy, & Billings, 2017). Given these inconsistencies further research is warranted. Finally, being female was associated membership in the moderate PTSD gradual responding class when compared to the high PTSD gradual responding class and older age was associated with membership in the moderate PTSD rapid response class when compared to the moderate PTSD gradual responding class. These findings suggest that older age and being female may be associated with less severe PTSD and better treatment outcomes.

Overall this study identified protective and risk factors associated with PTSD treatment response. Emotional and detached coping, re-experiencing and avoidance symptoms and low social support have been found to increase risk of treatment resistance and social support has been found to be associated with less severe symptoms which are more likely to improve over the course of treatment. These findings have important clinical implications. These factors could potentially identify participants who are at risk of developing more severe PTSD which may not respond to treatment. Furthermore, the factors could be specifically addressed in order to increase positive outcomes for all participants. The findings of the current study should be interpreted in the light of several limitations. Firstly, there has been recent changes to PTSD's diagnostic criteria (DSM-5: APA, 2013). The current study did not include the recently added symptom cluster: negative alterations in cognition and mood. The role of this symptom cluster

in predicting PTSD trajectories should be examined in future research. Secondly, the exclusion criteria may have impacted the results and it is likely that this may have reduced the generalizability of the current findings. Thirdly, the personalised nature of the treatment and the lack of information about the treatment plans meant that we could not control for treatment characteristics in the analyses. It is possible that these characteristics could have influenced PTSD trajectory membership. Finally, the assessments were all based on self-report questionnaires which may be biased. However, all measurements utilised have been previously found to be valid and reliable. Despite these limitations this study adds to the literature on protective and risk factors in relation to PTSD severity and treatment response. Further to the best of our knowledge this was the first to examine the role of social support, coping style and PTSD symptom clusters as predictors of heterogeneous trajectories of PTSD treatment response.

Chapter 8: Research summary and recommendations for further research

8.1 Introduction

Childhood sexual abuse (CSA) is a serious worldwide problem which affects individuals from every social group within every country (Barth, Bermetz, Heim, Trelle, & Tonia, 2013; UNICEF, 2014). The research discussed in Chapter 1 clearly evidenced that CSA is a robust predictor of a broad range of psychological disorders such as posttraumatic stress disorder (PTSD), depression, anxiety and somatic disorders (Maniglio, 2009; Paolucci, Genius, & Violato, 2001). Survivors of CSA may require treatment and there is evidence suggesting that psychological treatment such as cognitive behavioural therapy (CBT) or cognitive processing therapy (CPT) are effective in reducing trauma related symptomology (Taylor & Harvey 2010). What was also clear from the research discussed in Chapter 1, was that CSA survivors are not a homogenous group. Empirical evidence has demonstrated substantial variability relating to psychological outcomes (both type and severity; Browne & Finkelhor, 1986; Finkelhor, 1990; Steine et al., 2017^b). For example, some CSA survivors have little to no adjustment difficulties relating to their abuse experiences (Farber & Egeland, 1987) and others experience severe and chronic psychological difficulties (Maniglio, 2009). Furthermore, there is evidence to suggest that CSA survivors who seek treatment for trauma associated symptoms vary in relation to length of spent in treatment (Harte, Hamilton, & Meston, 2013) and how their symptoms change over the course of time (Steine et al., 2017^a).

There is a continually expanding body of literature examining psychopathology and treatment outcomes among CSA survivors. The studies within the current thesis aimed to uniquely contribute to the literature by using a number of novel methods to examine these outcomes in a large sample of survivors of CSA attending weekly psychotherapy. Two of the studies used

latent mixture modelling to uncover hidden subgroups within this population relating to Axis I disorder profiles and PTSD treatment response trajectories. These methods allow for the identification of individuals with the poorest outcomes who may require more intensive or alternative therapy. Furthermore, the identification of subgroups which differ in terms of disorder severity or treatment response allows for the examination of risk and protective factors.

Given the high prevalence rate of CSA and the potential negative consequences associated with the experience of CSA, understanding factors within the broader context of the survivor's life, which may influence the development of negative outcomes is imperative. It is possible that these factors could be modified during interventions and subsequently lead to a decrease in psychological distress. In addition to examining the three outcomes mentioned above (Axis I disorder profiles, PTSD treatment response trajectories and length of time spent in treatment), this thesis aimed to identify factors which could explain variation in each of these outcomes. The main focus was to examine the roles of coping style and social support as these factors could potentially be modified or targeted during treatment. Socio-demographic and trauma characteristics were also included in the analyses. The current chapter will attempt to bring together the findings from all of the empirical chapters by exploring how this research has contributed to the understanding of psychological and treatment outcomes among CSA survivors as well as risk and protective factors associated with these outcomes. The clinical implications of the findings will be discussed. Finally, the limitations of the research and future directions for this area of research will be explored.

8.2 Psychopathology and treatment outcomes

Two of the studies within this thesis used advanced statistical techniques (latent variable modelling) to examine whether unobservable subgroups (relating to Axis I disorder severity and PTSD treatment response) existed. These methods can reveal unobservable heterogeneity and identify meaningful subgroups of individuals who are similar based on their scores on a number of variables (Muthén, 2004; Nylund, Asparouhov, & Muthén, 2007). It has been suggested that latent variable modelling is better able to demonstrate the complex realities of the data used in psychiatry and psychology research than other variable focused methods such as regression (Cai, 2012). Given the substantial heterogeneity among CSA survivors these methods are appropriate and uncovering subgroups may have useful clinical implications.

The study described in Chapter 3 aimed to increase understanding of the heterogeneity in psychopathology among CSA survivors. The study examined prevalence rates of five disorders (PTSD, MDD, dysthymia, somatoform, disorder and anxiety) and examined whether subgroups existed with respect to disorder type and severity. Although some research has indicated that PTSD is the one of the most common disorders associated with CSA (Kendall-Tackett, Williams, & Finkelhor, 1993), it has been suggested that many survivors of complex trauma (such as CSA) experience symptoms which are over and above the symptoms included in the PTSD model (Cloitre et al., 2012). Consistent with this Maniglio, (2009) suggested that CSA survivors often experience comorbid psychological disorders. A number of studies have evidenced co-occurring psychological disorders among survivors of CSA (e.g. Trickett, Noll, & Putnam, 2011). However, many studies have used variable centered methods which do not account for heterogeneous subgroups. Recently there has been an increase in studies using

latent variable modelling such as latent class analysis (LCA) or latent profile analysis (LPA) to examine comorbid conditions (such as PTSD, depression and anxiety) in trauma populations including veterans (Armour et al., 2015), trauma exposed students (Contractor, Roley-Roberts, Lagdon, & Armour, 2017) sexual assault survivors (Au, Dickstein, Comer, Salters-Pedneault, & Litz, 2013), trauma exposed soldiers (Contractor et al., 2015), survivors of natural disasters (Cao et al., 2015; Lai, Kelley, Harrison, Thompson, & Self-Brown, 2013) and survivors of vehicle accidents (Hruska, Irish, Pacella, Sledjeski, & Delahanty, 2014). It has been suggested that identifying subgroups of disorders can contribute to the understanding of the aetiology of trauma associated disorder/symptoms as well as informing assessment and treatment planning (Contractor et al., 2015; 2017). However, there have been no known studies which have used these methods to examine patterns of comorbid disorders among CSA survivors. This gap in the literature was addressed in Chapter 3.

There were a number of notable findings from the study described in Chapter 3. Firstly, relatively high rates of all five disorders examined were found. The prevalence rates of subclinical disorders ranged between 50.6% and 82.2% and prevalence rates for clinical levels of the disorders ranged between 20.7% and 76.1%. The high rates of psychopathology were expected given that the sample comprised survivors of CSA who were seeking treatment for psychological trauma associated symptoms/disorders. This finding added to the already extensive body of literature demonstrating high rates of psychopathology among CSA survivors (Chou, 2012; Cutajar et al., 2010; Maniglio, 2009; Trickett et al., 2011; Finkelhor & Browne, 1986; Paolucci et al., 2001). The second important finding indicated that there were high rates of individuals who met the subclinical criteria (79%) and clinical criteria (52.6%) for two or more disorders. This finding was in line with previous research which has revealed

co-occurring disorders are common among trauma survivors including individuals who have experienced CSA (Cloitre et al., 2009). These results highlighted that treatment survivors of CSA should be assessed and treated for multiple psychological disorders.

The main aim of the study was to examine whether subgroups relating to scores on five Axis I disorders existed. LPA was conducted and the results indicated the existence of three subgroups. The high disorder class (61.2% of participants) was characterised by the highest levels of all five disorders. Individuals in this class were likely to have clinical levels of PTSD, dysthymia, MDD and anxiety and subclinical levels of somatic disorder. Further, a chi square test revealed a significant association between membership in this class and past suicide attempts. The moderate disorder class (29.3% of participants) was characterised by clinical levels of anxiety and non-clinical but relatively moderate levels of MDD, PTSD, dysthymia, and somatoform disorder. The low disorder class (9.5% of the sample) was characterised by the low and nonclinical scores for all five disorders. The finding of three classes was in line with other studies which have examined PTSD, anxiety and depression in (Contractor et al., 2015) among trauma exposed soldiers and PTSD and depression among veterans (Armour et al., 2015). The study described in Chapter 3 however also included somatoform disorder. The results suggested that individuals with clinical PTSD, dysthymia, MDD and anxiety also had sub-clinical levels of somatoform disorder. Although, somatoform disorder has been examined among CSA survivors this was the first known study to include it along with depression, anxiety and PTSD when using LPA to examine disorder subgroups. This finding suggests that should CSA survivors should also be assessed for somatoform disorders. Further, individuals presenting with medically unexplained or somatic symptoms should be considered for

assessment of psychological disorders including, PTSD, MDD, dysthymia and anxiety. This finding should also be examined in other trauma populations.

Consistent with other previous studies (Armour et al., 2015; Au et al., 2013; Contractor et al., 2015; Lai et al., 2015), Chapter 3 identified classes which differed largely in terms of disorder severity rather than in terms of disorder type (i.e. there were no classes with very high scores on some disorders and very low on the other disorders). There have however been some studies which have found classes which differed in terms of disorders. For example, Contractor et al. (2017) found three classes when examining comorbid PTSD and depression. One class was characterised by severe PTSD and depression, the second was characterised by low PTSD and more severe depression and the third was characterised by low depression and higher PTSD. It was argued that the inconsistencies between studies could be explained by differences in the methodologies such as the assessment methods or the populations (Contractor et al., 2017). The classes in the current study which were on a severity based gradient suggest that the disorders under investigation are likely to co-occur and as the severity of one disorder increases the severity of the other disorders increase. This result concurs with previous research which has evidenced that PTSD, depression, anxiety and somatic symptoms are commonly comorbid in trauma populations (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). A number of possible explanations for the high rates of comorbidity between the disorders were explored in Chapter 3. It was suggested that the high rate of individuals experiencing clinical co-occurring disorders could be due to the pervasive negative impact of CSA. For example, Finkelhor and Browne (1987) suggested that the range of disorders/symptoms which arise from the experience of CSA are due to four dynamics: traumatic sexualisation, betrayal, powerlessness and stigma (Finkelhor & Browne, 1987). It is thought that each dynamic can explain different

negative outcomes associated with CSA. For example, powerlessness (which results from the individual repeatedly having their own body violated) is thought to be associated with anxiety, somatic symptoms, dissociation and depression and betrayal (which results from the realisation that a trusted individual has failed to protect or abused) conduct problems and interpersonal difficulties. The concepts of complex PTSD (CPTSD; Herman, 1995) and Developmental Trauma Disorder (DTD; van der Kolk et al., 2005) could also be useful in explaining these results. It has been suggested a broad range of symptoms among complex trauma survivors (such as CSA) are as a result of difficulties with affect regulation, attention, interpersonal skills and consciousness (Cloitre et al., 2012). These models both suggest that CSA disrupts multiple domains which account for the wide reaching difficulties experienced. Other models suggests that PTSD, depression and anxiety should be all categorised as distress disorders which are characterised by negative affect (Simms, Prisciandaro, Krueger, & Goldberg, 2012; Watson, 2005). More recently, evidence has suggested that somatic disorders also fall within this category (Simms et al., 2012). If this is the case it is possible that individuals within the high disorder class have PTSD, depression, anxiety and subclinical somatoform disorder due having high levels of negative affect.

Causal theories suggest that one or more of the disorders cause the other disorders (Stander et al., 2014). Consistent with the causal theories research has demonstrated that individuals with PTSD become anxious about their symptoms (Breslau, Davis, Peterson, & Schultz, 1997). Moreover, PTSD has been associated with a greater risk of experiencing somatic symptoms (Elklit & Christiansen, 2009). Other theories include the confounding factors theories (which suggest comorbidity is coincidental) and the common factors theories (which suggest that the disorder are independent and distinct but share risk/vulnerability factors; Stander et al., 2014).

Although the findings in Chapter 3 suggest that the disorders (PTSD, MDD, dysthymia, anxiety and somatoform) co-occur at high rates (63.3% of participants were members of the high disorder class) and as the severity of one disorder increases the severity of the others increase the analysis did not enable the underlying mechanisms to be determined. A number of other limitations impact the conclusions which can be drawn. For example, no information relating to the onset of disorder was available therefore the temporal order of the disorders could not be established. Further, the measurement used to assess psychopathology (MCMI-III; Millon, 1997; 2009) corresponds to the DSM-IV-TR (APA, 2000) criteria. It is possible that if the more recent criteria was utilised the classes would have been different. Despite these limitations, the findings uniquely contributed the literature in a number of ways.

Firstly, this was the first known study to use LPA to examine co-occurring Axis I disorders in a sample of CSA survivors. Second, this study extended on prior research which has utilised person centered methods (such as LPA) in trauma population by include somatoform disorder in the analysis when examining PTSD, depression and anxiety. Similar to studies in other trauma populations (e.g. trauma exposed soldiers; Contractor et al., 2015), the findings have provided empirical evidence of the existence of subgroups relating to severity of depression (dysthymia and MDD), anxiety, PTSD, and somatoform disorder. This finding highlights the need for multifaceted assessments and treatment modalities. It also confirms large individual differences relating to psychopathology severity in the current sample. Based on this finding a ‘one size fits all’ treatment may not be appropriate. It is of concern that membership in the high disorder class was significantly associated with past suicide attempts. Clinicians should also be aware of this finding high group considered high risk should be assessed. These findings need to be replicated by future studies. Further research should also focus on examining the complex underlying mechanisms relating to co-occurring disorders among trauma survivors.

Chapter 6 was the second study which aimed to examine heterogeneity of outcomes among CSA survivors by using latent mixture modelling. As previously mentioned survivors of CSA may attend treatment for trauma associated psychopathology and there is evidence suggesting that psychological therapy can be effective in reducing these symptoms (Taylor & Harvey, 2010). There is a relatively large number of studies examining treatment response among CSA survivors (e.g. Chard, 2005; Taylor & Harvey, 2010). The findings from these studies however do not reflect the presence of differential treatment response trajectories. Studies which have used latent mixture models in other trauma populations have found individual distinct subgroups relating to treatment response (Currier, Holland, & Drescher, 2014; Elliot, Biddle, Hawthorne, Forbes, & Creamer, 2005; Stein, Dickstein, Schuster, Litz, & Resick, 2012). For example, Currier et al., (2014) identified three trajectories in a sample of veterans attending residential PTSD treatment. The first class (48.8%) was characterised by symptoms which decreased over time, the second class (41%) was characterised by severe symptoms which did not decrease over time and the third class (10.2%) was characterised by milder symptoms which remained stable over time. It has been argued that understanding distinct subgroups relating to PTSD treatment response can lead to treatment which is more tailored to the individual (Elliot et al., 2005). One study has examined PTSD trajectories among CSA survivors (Steine et al., 2017^a). However the participants were not attending regular treatment. Chapter 6 aimed to address the gap in the literature by using LCGA to examine whether multiple trajectories relating to PTSD treatment response existed.

As expected the results revealed that the mean PTSD score reduced from a clinical to a non-clinical level over a period of 18 months this was consistent with the results of a literature review which examined the effectiveness of psychological therapy (59 different treatment

modalities) and found an overall decrease in PTSD symptoms (Taylor & Harvey, 2010). LCGA revealed the presence of distinct subgroups which differed in terms of PTSD severity and longitudinal course. This finding echoed findings from studies in other trauma populations (Currier et al., 2014; Elliot et al., 2005; Stein et al., 2012) which have found distinct subgroups which vary in terms of PTSD severity and course. The four class solution was found to be optimal. Two classes had moderate levels of PTSD at baseline. The moderate PTSD gradual response class (33.03% of participants) had moderate levels of clinical PTSD which steadily improved over a period of 18 months to below the clinical cut off point. Individuals in the PTSD rapid response class (15.71%) experienced a rapid improvement in symptoms within the first 6 months of treatment this was followed by a more gradual improvement over the next 12 months. This class was similar to a class identified in a sample of treatment seeking veterans (Elliot et al., 2005). The finding of two moderate PTSD classes is novel. It is possible that this finding is specific to this population although it could also be due to differences in methodology such as the measurements used or the type of treatment. Additionally, two classes with high clinical PTSD at baseline were identified. The high PTSD gradual response class (36.22%) was characterised by high clinical PTSD at baseline which gradually decreased to a non-clinical level over the course of the treatment. The final class (15.03% of participants) was labelled the high PTSD treatment resistant class. This class did not experience a significant reduction in symptoms over the course of treatment. This class was similar to a class found a subgroup of veterans attending treatment who did not significantly improve over time (Currier et al., 2014).

In summary, the findings from Chapter 6 indicated the presence of distinct subgroups which differ in terms of PTSD severity and course in a large sample of CSA survivors. Further, even individuals with similar levels of baseline PTSD may respond differently to treatment. For example despite two moderate classes having similar PTSD at baseline one group responded

more quickly and there was an increased reduction in symptoms. Moreover, the two high classes had similar baseline rates and although one group significantly improved over time the other did not. The majority of participants did respond positively to treatment (only 15.03% of participants were in a class which had symptoms which did not significantly improve over time). However, a waitlist control group was not used as a comparison therefore it cannot be concluded that the changes over time were as a result of the treatment or whether they were due to other factors not included in the study. The mean length of time since the trauma was 22.2 years therefore it is possible that many of the participants had chronic PTSD symptoms and that the treatment at least partly explained the improvement in symptoms over time. Future studies should attempt to replicate these findings while using a waitlist control group as this could reveal if the changes were likely to be due to the treatment. In terms of clinical implications the findings suggest that individuals with more severe PTSD at baseline may be less likely to respond to treatment. Clinicians should be aware of this finding. Further, researchers and clinicians should attempt to understand factors which may differentiate individuals who respond to treatment and those who do not respond to treatment. Finally, as the study described in Chapter 3 highlighted that individuals with clinical PTSD were more likely to meet the criteria for anxiety, depressive disorders and somatic disorder future studies should examine how co-occurring symptoms change over the course of treatment.

In summary, both of the studies described above uniquely contributed to the literature by utilising latent mixture modelling to examine psychopathology and PTSD treatment response in a sample of treatment seeking CSA survivors. Both studies have highlighted the substantial heterogeneity among CSA survivors. Clinical implications include the importance of utilising multifaceted assessments and treatments. Additionally, individuals with more severe PTSD may be less likely to respond to treatment this should be monitored throughout the course of

treatment. Identifying unique subgroups also allows for the comparison of groups in order to identify potential risk and protective factors. Finally, the findings indicated that distinct subgroups were present this also highlighted the importance of using analytic techniques such as LPA and LCGA. However, as with any analytic methods, latent growth modelling has a number of limitations. Lanza and Rhoades (2013) suggested that when using methods such as latent class analysis (LCA), reification is an important issue. It was argued that latent classes should not be viewed as actual representations of the individuals but as a heuristic which reflects heterogeneity (Lanza & Rhoades, 2013). Other limitations include potential model misspecification it has been suggested if too few classes were chosen as the optimal model an important latent class may be missed (Lanza & Rhoades, 2013). To reduce the problem of misspecification each the studies in Chapters 3 and 6 examined a number of different fit indices and classes were visually examined to ensure the subgroups were meaningful. Despite the limitations the modeling techniques utilised provided a sophisticated statistical framework which identified meaningful subgroups which could not have been observed with other techniques.

In addition to the studies described above, the length of time spent in treatment was examined in the current sample. Previous studies have suggested that early treatment attrition is a significant problem among CSA survivors (Claus & Kindleberger, 2002; Harte Hamilton, & Meston, 2013). This can leave the patient with unresolved trauma symptoms (Breslau, Lucia, & Davis, 2004). In addition to the personal cost of experiencing psychological distress ongoing symptoms place a financial burden on society due to repeated treatment seeking and increased healthcare utilisation (Armbruster & Kazdin, 1994; Kessler, 2000). The study described in Chapter 5 aimed to examine length of time in treatment in the current sample of sexual abuse survivors. Comparable to other studies (Chasson, Mychailyszyn, Vincent, & Harris, 2013)

Chapter 5 found that a relatively high number of participants left within the first six months (29.15%). The results also revealed that 26.42% of participants spent 6–12 months in treatment, 19.36% of participants spent 12–18 months in treatment, and 25.06% were still attending treatment at 18 months. As with the above outcomes these results indicated large individual differences within the sample with regard to length of time spent in treatment. From examination of the above results it could also be suggested the current sample has relatively high treatment dropout rates however it is a concern that there was no information regarding the number of treatment sessions attended. Additionally, there was no information regarding the reason for leaving treatment therefore it is not clear if the participant left due to feeling better or whether they still had unresolved symptoms. Finally, there was no specified time in which treatment should be completed. Future studies should consider these limitations when examining treatment dropout among CSA survivors. As the assessments were conducted every 6 months over a period of 18 months it allowed for the comparison of individuals who dropped out at different stages during the treatment. Within Chapter 5 a number of significant predictors were identified, these will be discussed in a later section of the current chapter.

8.3 Predictors of Axis I disorder profiles, length of time spent in treatment and PTSD treatment response trajectories

In addition to examining outcomes among CSA survivors attending treatment this thesis aimed to explore factors which could partly explain the variation found in psychopathology, length of time spent in treatment and PTSD treatment response. Understanding the factors explaining the heterogeneity in Axis 1 disorders, time spent in treatment and PTSD treatment response trajectories has a number of important implications for assessment and treatment planning.

Additionally, it allows for the identification of individuals who are at an increased risk of more negative outcomes and it is possible that some of the identified factors can be modified in order to reduce the negative outcomes and promote positive outcomes (Spaccarelli & Kim, 1995). Although protective and risk factors have been widely studied in trauma populations (mainly within veteran samples) it has recently been argued that there is a lack of studies examining risk and protective factors specifically in samples of CSA survivors (Steine et al., 2017^a). The studies in this thesis focused specifically on social support and coping styles as predictors of the outcomes examined. This was because these factors could potentially be modified or targeted in treatment. Other relevant factors were also included in each individual analysis.

8.3.1 Social support

Research has consistently demonstrated an association between positive social support and more positive psychological outcomes following experiences of stress or trauma (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Studies in trauma populations have demonstrated that social support is protective against the development of PTSD (Joseph et al., 1992; Joseph et al., 1993). Similar findings have also been evidenced in samples of maltreated children (including CSA survivors; Zajac, Ralston, & Smith, 2015). Although the evidence suggests that social support can be protective following the experience of CSA the experience of CSA itself has been found to be associated with low levels of social support and the perception that little support is available (Charuvastra & Cloitre, 2008). Evidence has shown that CSA can lead to insecure attachment orientations (Elklit, 2009). Moreover, insecure attachment has been found to be associated with poor interpersonal skills

(Bowlby, 1982; Collins & Read, 1994). Additionally, according to Finkelhor and Browne (1985) feelings of betrayal can develop when the child realises a trusted adult abused or failed to protect them. These feelings have been found to be associated with mistrust, clinging and intimacy problems (Finkelhor & Browne, 1985).

Within the current thesis social support at the time of the abuse was measured retrospectively and current social support was measured during the initial assessment. Social support was examined as a predictor of Axis I disorder profiles, length of time spent in treatment and PTSD treatment response trajectories. There are no known previous studies which have examined social support as a predictor of length of time spent in treatment. In Chapter 5, the results revealed that social support (neither at the time of the abuse or current) was not significantly associated with length of time spent in treatment. Although this suggests that social support, may not play a significant role in determining risk of leaving treatment early within the current sample these findings need to be replicated. Chapter 4 examined social support as a predictor the previously identified Axis I disorder profiles (low, moderate and severe disorder classes). As expected, the results revealed that higher levels of support at the time of the abuse was associated with psychopathology severity. Specifically, social support was associated with a decrease in odds of membership in the high disorder class and the moderate disorder class when compared to the low disorder class. Surprisingly, current social support was not predictive of psychopathology severity. In contrast, in Chapter 7 when social support was examined as a predictor of PTSD treatment response, social support at the time of the abuse was not predictive of treatment response. However, current social support was associated, with reduced odds of being in the high PTSD treatment resistant class when compared to the both moderate PTSD classes. Further, when both high PTSD classes were compared, social support was associated

with treatment response and when both moderate classes were compared it was associated with a more rapid improvement in symptoms.

Both the studies in Chapter 4 and Chapter 7 support the already large body of literature which has evidenced a relationship between social support and more positive outcomes in trauma survivors (Joseph et al., 1992; Joseph et al., 1993). However, the current findings are unique, as there have been no previous studies examining the role of social support in relation to Axis I disorder profiles and PTSD treatment response trajectories among CSA survivors. Furthermore, the findings highlight that the protective nature of the social support depends on the time at which the social support occurred. Based on the evidence from these studies it could be suggested that the positive social support preceded the positive outcomes. For example, social support at the time of the abuse (onset in childhood) predicted psychopathology at the initial assessment (mean of 22.2 years after the end of the abuse). Moreover, social support at the initial assessment predicted less severe PTSD at the initial assessment but also predicted an improvement in symptoms between T1 and T4 (18 months after the initial assessment). If this was the case, the findings lend support to theories which suggests that social support influences psychological outcomes. For example, it has been suggested that regardless of the situation social support has a positive influence on psychological wellbeing as it is associated with positive moods and self-worth (Cohen & Wills, 1985). Additionally, the social buffering theory suggests that social support has an indirect positive impact on mental health as it acts as a buffer against the negative effects of general stress and trauma (Cohen & Wills, 1985). There are a number of reasons which may explain why social support acts as a buffer. It has been suggested that social support at the time of the trauma leads to more positive appraisals and this in turn has been found to be protective against the development of psychopathology (Spaccarelli, 1994). Negative appraisals relating to sexual abuse have been found to predict more severe

internalising and externalising symptomology among sexual abused adolescents (Bal, Crombez, De Bourdeaudhuij, & Van Oost, 2009). Additionally, Finkelhor and Browne's (1985) traumagenic dynamics model of CSA suggests that negative social reactions (relating to the disclosure or the trauma) and lack of support may increase levels of the stigmatization. It has been proposed that the stigmatization dynamic which can increase feelings of isolation and shame, may lead to drug and alcohol abuse as well as self-harming, low self-esteem and suicidal behaviour (Finkelhor & Browne, 1985). Finally, other evidence has shown that having an opportunity to safely discuss the abuse can allow the trauma memories to be effectively processed (Rachman, 1980).

Within the current sample it is possible that low support at the time of the abuse contributed to the development of psychopathology. This may explain the relationship between social support at the time of the trauma and lower levels of anxiety, PTSD, dysthymia, MDD and somatoform symptoms at the initial assessment. If social support at the time of the abuse is associated a lower risk of developing severe psychological disorders, professionals working with children who are known to have experienced CSA should assess type and quality of social support. If individuals have poor social support, it may be appropriate to utilise an intervention designed to increase support. A recent review examining resilience factors among CSA survivors concluded that family support, positive peer relationships and social support was associated with resilience (Marriott, Hamilton-Giachritsis, & Harrop, 2014). The authors suggested that these factors could be improved through health promotion programs and social policies with the aim to provide sense of community and provide support (Marriott et al., 2014).

Although social support at the time of the trauma was found to predict pre-treatment psychopathology it was not found predict PTSD treatment response. Thus it appears that the positive impact of support at the time of trauma does not extend to treatment response. The findings indicated that current social support is more important for predicting longitudinal changes in PTSD over the course of treatment. Similar to the findings in Chapter 4 it is possible that current social support influences PTSD course and severity by having a buffering effect. Additionally, it is possible that current social support is associated with good interpersonal skills and that within the current sample, individuals with good interpersonal skills may be more likely to build up a more positive therapeutic relationship with the therapist and thus respond more positively to the treatment. In line with this argument, one study found that social support predicted early treatment alliance and this was associated with better treatment engagement in a sample of treatment seeking CSA survivors (Keller, Zoellner, & Feeny, 2010). If current social support does influence PTSD treatment response clinicians working with CSA survivors should assess social support. It is possible if this was targeted during treatment that this could contribute to a reduction in PTSD symptoms. Consistent with this idea one recent study evaluated the use of Skills Training in Affective and Interpersonal Regulation (STAIR) in a sample of CSA survivors. This program is based on interpersonal and attachment theories and one of the aims is to improve interpersonal skills. The findings indicated that individuals who participated in the program experienced a reduction in interpersonal difficulties as well as trauma associated symptoms (MacIntosh, Cloitre, Kortis, Peck, & Weiss, 2016).

An alternative explanation for the relationship between social support and more positive outcomes in the current studies could be due to the negative impact that psychopathology has

on social relationships. Psychopathology at the time of the trauma was not retrospectively measured and social support was not examined longitudinally over the course of treatment. Therefore the direction of the relationship cannot be concluded. There has been some debate within the literature relating to the direction of this relationship. Some studies have found that social support influences PTSD (Brewin et al., 2000). However, there is also evidence suggesting that trauma symptoms such as PTSD can also negatively impact social relationships. For example, one study found that low levels of family support immediately after the trauma was associated with PTSD but PTSD symptoms also predicted low levels of social support (Kaniasty & Norris, 1993). Recently, one study examined the direction of the relationship between PTSD and social relationships and the results suggested that social support was more likely to influence PTSD development rather than vice versa (Freedman, Gilad, Ankri, Roziner, & Shalev, 2015). Although the evidence in the current thesis suggests that social support predicts psychopathology and treatment response the exact mechanisms of the relationship cannot be determined due to limitations in the methodology. It is also worth noting that social support at the time of the trauma (which ended on average 22.2 years ago) was measured retrospectively. It is possible that this measure could be affected by recall bias, and is in contrast to the measure of current social support. Further longitudinal studies are required and should attempt to examine how the relationship between psychopathology and social support changes over time.

Despite the limitations, the studies described above have contributed to the literature as they are the first known studies to examine social support in relation to Axis I disorder profiles and PTSD treatment response trajectories. Taken together the results suggest that social support has a protective influence. Based on these findings clinicians should assess social support in

child and adult survivors of CSA and consider implementing programs aimed to improve support.

8.3.2 Coping style

Coping style has also consistently been implicated in explaining variation in outcomes among trauma survivors (Elklit, 2015; Karstoft et al., 2015; Kuyken & Brewin., 1999; Shapiro & Levendosky, 1999). In the current thesis four coping styles were examined. These were: detached (for example, resolving the issue by not becoming identified with it), rational (for example, taking action to change things), emotion focused (for example, feeling helpless, there is nothing you can do about it) and avoidant (for example, trying to forget about the whole thing; Roger et al., 1993). Emotion focused and avoidant coping styles have been found to be associated with increased negative outcomes (Elklit, 2015; Karstoft et al., 2015; Kuyken & Brewin., 1999; Sigmon et al., 1997) and rational coping has been found to be associated with more positive outcomes (Coffey, Leitenberg, Henning, Turner, & Bennett, 1996). Roger et al. (1993) suggested that detached coping is also an adaptive coping style which is associated with less psychological distress. This coping style however has not been as extensively studied as the other styles described above.

It is thought that the coping style at the time of the abuse can influence future coping style (Shapiro & Levendosky, 1999). During the abuse the child has no control over what is happening to them and using emotional and avoidant methods can help to immediately reduce psychological distress (Sigmon et al., 1997; Spaccarelli, 1994). However, studies have shown that if the individual continues to use these methods they can have a long term negative impact

(Ehlers & Clark, 2000). For example, one review of 39 studies, concluded that long term use of avoidant coping was related to increased psychological distress (Walsh, Fortier, & DiLillo, 2010). In order to decrease internal distress individuals using these methods may be likely to avoid thinking or talking about their abuse experiences. It has been suggested that these coping methods prevent processing of these negative memories and is thought to be related to PTSD development and maintenance (Ehlers & Clark, 2000). However, rational coping is associated by making positive changes to the external reality in order to change the situation (Lazarus & Folkman, 1986). An individual who utilises this coping style will not avoid talking or thinking about the trauma and thus the trauma associated memories may be more likely to be processed and subsequently the individual will experience less psychological distress (Ehlers & Clark, 2000).

Within the current thesis, coping styles were examined as predictors of Axis I disorder profiles, length of time spent in treatment and PTSD treatment response trajectories. One previous study examined coping style as a predictor of treatment attrition among CSA survivors and found that individuals with positive coping styles were more likely to drop out (Harte et al., 2013). The authors suggested due to the positive coping strategies already in place, the individuals may view themselves as being less in need of treatment for management of the negative consequences of their trauma. Contrary to this finding, the study in Chapter 5 found that emotional, rational, detached, or avoidant coping styles were not associated with time spent in treatment. These results suggest that coping style may not play a significant role in determining risk of leaving treatment early within the current sample. However, given the previous inconsistencies in finding further research is warranted.

Consistent with the previous literature, the studies in Chapter 4 and Chapter 7 found that emotional coping was associated with more negative outcomes. In chapter 4, emotional coping was associated with membership in the high disorder class when compared to the moderate and low disorder classes. Additionally, it was associated with membership in the moderate disorder class when compared to the low disorder class. In line with the theories described above is possible that the individuals with high levels of current emotional coping were still using the coping style which they used to reduce internal distress as the time of the abuse. As this coping style is associated with avoiding internal distress the individual may be less likely to think or discuss the trauma related memories. Research has suggested that thinking or discussing the memory can weaken memories associated with anxiety and fear (Foa, Steketee, & Rothbaum, 1989). However, emotional coping does not allow this process to occur. Within the current sample this may have contributed to the development of psychopathology and thus explain why high emotional coping was predictive of more severe PTSD, dysthymia, MDD, somatoform disorder, and anxiety.

The study in Chapter 7 found that higher levels of emotional coping predicted membership in the treatment resistant class when compared to both moderate PTSD response classes and the high PTSD gradual responder when compared to the moderate PTSD rapid response class. This suggests that emotional coping is associated with more severe pre-treatment PTSD as well as chronic PTSD which may not respond to treatment. These findings highlight the long-term maladaptive nature of emotion focused coping. As emotional coping is associated with associated with reducing immediate psychological distress (Lazarus & Folkman, 1984), an individual with high levels of emotional coping may find it difficult to discuss their trauma related memories during therapy. If the individual is unable to face their difficulties they may not engage effectively in treatment and this may explain why individuals with high levels of

emotional coping have a poorer treatment response. Notably, the results in Chapter 7 also indicated that detached coping was associated with membership in the treatment resistant class when compared to the moderate rapid response class. It is possible that feeling detached from the traumatic event prevents the processing of the traumatic memories in a similar way to emotion focused coping (Ehlers & Clark, 2000). Further, if an individual views themselves as separate or independent from the traumatic experience they may find it difficult engaging in treatment relating to the trauma. These findings however are contrary to the view that detached coping is an adaptive response to stress (Roger et al., 1993). Further studies should examine the role of detached coping as a predictor of PTSD treatment response among CSA survivors. Also contrary to previous research, the current study found that neither rational or avoidant coping styles were significantly associated with psychopathology or treatment response. It is possible that these inconsistencies were due to differing methodologies such as the measure used or the population.

The results relating to coping style should be interpreted in the light of several methodological limitations. Although the results suggest that coping style influences psychopathology and treatment response, it is possible that individuals with greater psychological difficulties use maladaptive coping as an attempt to reduce distress. As coping style was not measured retrospectively no conclusions regarding the direction of the relationship can be made. Another limitation was the assessment of coping style. Although the Coping Style Questionnaire has been found to be both valid and reliable (Rogers et al., 1993) the measurement and categorisation of coping styles vary widely across studies thus making it difficult to compare results. It is possible that these methodological differences could explain the inconsistencies in the findings relating to avoidant, detached and rational coping. Although these results require

further investigation, they have some important clinical implications. Firstly, clinicians working with children who are known to have experienced CSA should consider assessing coping style. It is possible that by decreasing levels of emotional coping style and teaching a more adaptive coping style that this could protect against the development of trauma related psychopathology. Further, clinicians working with adult survivors attending treatment should also assess coping style. The results in Chapter 7 suggest that emotional coping is associated with more severe pre-treatment PTSD as well as less of an improvement over time. Individuals with high emotion focused coping and detached coping should be considered as having an increased risk of having PTSD symptoms which may not respond to treatment. If these coping styles were reduced during treatment it is possible it may allow for the processing of distressing memories, and thus reduce PTSD symptomology.

8.3.3 Trauma characteristics

Trauma characteristics were also examined in relation to the psychological and treatment outcomes studied in the current thesis. It is not surprising that factors relating to the sexual abuse itself such as the duration and the severity of the abuse and the victims relationship with the perpetrator, can explain some of the variation in adjustment in survivors of CSA (Browne & Finkelhor, 1986; Steel, Sanna, Hammond, Whipple, & Cross, 2004; Steine et al., 2012). Previous research has evidenced that abuse involving violence or penetrative abuse increases the risk of developing psychological disorders such as depression and PTSD (Kendall-Tackett et al., 1993; Steine et al., 2012). However, there have been some inconsistencies in the literature and some studies have suggested that abuse type and severity does not predict psychological adjustment (e.g. Paolucci et al., 2001). Other research has examined the role of experiencing cumulative trauma. As discussed throughout this thesis, CSA is likely to occur alongside other

types of childhood maltreatment (Alexander & Schaeffer, 1994; Ray, Jackson, & Townsley, 1991). Research has demonstrated a dose response relationship between the number of cumulative traumas experienced in childhood and the number of psychological difficulties experienced in adulthood (Anda et al., 2006; Cloitre et al., 2009; Wu, Schairer, & Dellor, 2010). Although the examination of abuse type and severity was not the focus of the current thesis some abuse characteristics were included in the analyses.

In Chapter 4 the following variables were examined as predictors of Axis I disorder profiles: penetrative abuse, number of cumulative traumas and number of sexual abuse acts. Contrary to previous research (Fergusson et al., 2013; Steine et al., 2017^b) the results indicated that penetrative abuse was not associated with psychopathology. The results did however reveal that experiencing a greater number of types of sexual abuse predicted more severe psychopathology. Although the cumulative number of sexual abuse types did predict psychopathology, the cumulative number of traumas did not. Previous studies have found that cumulative childhood trauma is associated with increased symptom complexity in adults (Cloitre et al., 2009). Within the current thesis the total number of traumas experienced included traumas which were not confined to childhood. It is possible that the results would have been different if child and adult trauma were separated in the analysis. This should be examined further in samples of CSA survivors.

In Chapter 5 Chi square tests and ANOVAs were conducted to examine significant associations between length of time in treatment and a range of abuse characteristics. The results found no significant association between length of time in treatment and cumulative trauma, type of sexual abuse (noncontact, contact, and penetrative), age of onset and end of abuse, reporting

the abuse to the police, attending a court case, prosecution of the perpetrator or relationship with the perpetrator. The only trauma characteristics which were significantly associated with time in treatment were the experience of rape (at any life stage- childhood or adulthood) and the experience of childhood neglect. When included in the regression analysis rape and neglect were both predictive of leaving treatment in the early stages. This finding was in line with the finding that more severe abuse predicted early treatment dropout (Lau & Kristensen, 2007; McDonagh et al., 2005). In contrast however, another study found that less severe abuse predicted dropout in a sample of abused youth (Chanson et al., 2013) and others have found no significant relationship (Tarrier, Sommerfield, Pilgrim, & Faragher, 2000). Given these inconsistencies, further research is warranted to better understand which abuse characteristics may influence length of time in treatment. Despite the inconsistencies in the literature the current results suggest that individuals who have experienced cumulative trauma (specifically neglect and rape in addition to CSA) should be considered at high risk from leaving treatment early. Clinicians and researchers should attempt to understand this relationship and explore methods of supporting these individuals to remain in treatment where appropriate.

In chapter 7, two abuse characteristics were included in the analysis: experiencing another trauma in addition to CSA (cumulative trauma) and the length of time since the trauma occurred. The study found that a greater length of time since the trauma occurred was associated with less severe PTSD at baseline. It is possible that this was due to a natural improvement in severe symptoms over time. Interestingly, it was also predictive of moderate PTSD which improved at a gradual rather than a rapid pace. In relation to cumulative trauma, consistent with the findings in Chapter 3, the study in Chapter 7 also found that cumulative trauma did not predict treatment response trajectory membership. This again could be due to the measurement of cumulative trauma which did not separate childhood and adulthood trauma.

As different trauma variables were included in each study it is difficult to make comparisons across the studies. However based on the results it is likely that abuse characteristics do at least partly influence psychological adjustment and treatment outcomes. Specifically, a higher number of sexual abuse types is associated with more severe psychopathology, the experience of neglect and/or rape in addition to CSA is associated with an increased risk of leaving treatment early and a greater time since the abuse was associated with less severe pre-treatment PTSD but a slower rate of improvement over the course of treatment. These findings highlight the importance of assessing abuse characteristics among treatment seeking CSA survivor. As previously mentioned there have been mixed findings in the literature. This could be due to a lack of standardised measures used to assess abuse and trauma characteristics. Moreover, there is wide variation in abuse types which fall within the ‘severe’ category. Further research is warranted to explore the relationship between trauma characteristics and psychological adjustment/treatment outcomes among CSA survivors.

8.3.4 Demographics

Demographic characteristics (education, gender and age) were also examined as predictors of all the above outcomes. Lower educational attainment has been found to be associated with increased negative outcomes among trauma survivors (Contractor et al., 2015; Pedersen et al., 2008) and higher educational attainment has been found to be associated with resilience among CSA survivors (Edmond, Auslander, Elze, & Bowland, 2006). In terms of length of time spent in treatment research has suggested that low education is a barrier to completing treatment and evidence shows it is associated with leaving treatment prematurely (Hatre et al., 2013). Consistent with the extant literature the findings in Chapter 4 revealed that higher education was associated with having reduced odds of membership in the high disorder class when

compared to both the low and moderate disorder classes. This finding was similar to another study which found that higher education predicted low to moderate levels of PTSD, depression and anxiety (when compared to severe levels; Contractor et al., 2015). In Chapter 5, the results revealed that individuals with higher levels of education were likely to spend longer in treatment (12–18 and 18+ months when compared to 0–6 months). Notably, in Chapter 7 education was not found to be predictive of PTSD treatment response. The findings from this thesis suggest that education is protective against the development of severe psychopathology and against leaving treatment early. It is generally accepted that low education is associated with a lower economic status and social position. These individuals are likely to have increased stress and reduced resources (e.g. Dohrenwend & Dohrenwend, 1969). This may explain why individuals with low education have an increased risk of having membership in the high disorder class. Worryingly individuals with lower education (who may have increased psychological difficulties) were found to be at increased risk of leaving treatment early. Lorion (1974) postulated that economically disadvantaged individuals are more likely to have a “crisis reactive” approach. This means the individual will only address critical problems and once the problem starts to decrease it is no longer a priority. In this case it is possible that once the symptoms start to reduce over the course of treatment, the individual no longer views it as a critical need and therefore leaves treatment. Clinicians should be aware of that individuals with low education are at increased risk of experiencing more severe psychopathology and early treatment dropout. Researchers and clinicians should attempt to understand how to better support CSA survivors with low education. One review of psychotherapy attrition suggested that individuals with lower levels of education could be taught skills which may facilitate treatment completion, and a brief therapy method could be used which would allow for treatment completion within a shorter period of time (Barrett et al., 2008).

A number of important gender differences were demonstrated in the current sample. In terms of gender and outcomes among trauma survivors there have been some inconsistencies in the literature. For example some studies have suggested that females have a lower risk of severe psychopathology (e.g. DuMont, Widom, & Czaja, 2007) whereas other studies have suggested that males have a lower risk (e.g. Little & Hamby, 1999). Contractor et al. (2015) however, found that gender was not associated with PTSD, depression and anxiety profile in a sample of trauma exposed soldiers. In line with this, a meta-analysis examining gender differences in PTSD among CSA survivors found no gender differences (Tolin & Foa, 2006). The current thesis found that males were more likely to have more severe psychopathology and more severe pre-treatment PTSD. As described above the previous research has been mixed. Within the current sample it was suggested that females may have sought help at an earlier stage whereas the males waited until their symptoms had become more severe before seeking help. In line with this suggestion, research has indicated that males are less likely than females to disclose sexual abuse (Holmes & Slap, 1998) and to seek help for trauma symptoms (Galdas, Cheater, & Marshall, 2005). Despite research showing that males and females improve at a similar rate, the results in Chapter 5 found that males were more likely to stay in treatment for a longer period of time (12–18 months when compared to 0–6 months). Taken together the studies in the current thesis suggest that being male is associated with an increased risk of more severe psychopathology, including pre-treatment PTSD. This may explain why males were more likely to spend longer time treatment. No differences were found however in relation to treatment response. These results require further investigation in order to understand the gender differences in this population. Previous findings relating to age and psychopathology in trauma samples have also been mixed. For example, there is research which indicates age is not a significant predictor of trauma symptoms profiles (Contractor et al., 2015). However, other studies have indicated that younger age is associated with more severe PTSD symptoms

(Naifeh, Richardson, Del Ben, & Elhai, 2010) and treatment dropout (Cloitre, Chase Stovall-McClough, Miranda, & Chemtob, 2004). Within the current sample, two studies (Chapters 4 and 7) found that older age was associated with less severe psychopathology and a more rapid treatment response, suggesting that it is a protective factor.

8.5 Summary of findings

Overall, the current thesis aimed to increase understanding of psychological and treatment outcomes among CSA survivors and identify risk and protective factors associated with the outcomes examined. Three studies explored the following outcomes: patterns of Axis I disorders, length of time spent in treatment and PTSD treatment response trajectories. Two of the studies utilised novel methods of examining patterns of Axis I disorders and treatment response trajectories. Both identified the presence of distinct subgroups which highlight the heterogeneous nature of CSA survivors. In terms of length of time spent in treatment, results suggested relatively high rates of participants left treatment before the second assessment. In addition to increasing the understanding of outcomes in this population a number of risk and protective factors were identified. Results suggested that social support was protective and it appeared to play a key role in explaining variation in psychopathology and PTSD treatment response. Coping style was also found to be an important determinant of both psychological and treatment outcomes. Higher levels of emotion focused coping were found to be associated with more severe psychopathology and PTSD treatment resistance. Additionally, increased detached coping was found to be associated with poorer PTSD treatment response. Some abuse characteristics were also found to explain variation in outcomes. A greater number of types of sexual abuse acts experienced predicted more severe psychopathology. Cumulative trauma predicted leaving treatment at an earlier stage and a longer time since the trauma occurred

predicted less severe pre-treatment PTSD but also a slower response to treatment (in participants with moderate baseline PTSD). In terms of demographic characteristics, increased education was found to be a protective factor. Education predicted spending a longer length of time in treatment as well as less severe pre-treatment psychopathology. Age was protective in relation to psychopathology and treatment response and being male was associated with increased negative outcomes in terms of psychopathology and spending longer in treatment.

8.6 Limitations

A number of limitations have been discussed throughout the thesis as well as the current chapter. There are also some notable overall limitations which reduce the generalizability of the findings. Firstly, research has indicated that CSA is largely underreported (Arata, 2002; Fergusson et al., 2000; London, Bruck, Ceci, & Shuman, 2005; Oates et al., 2000). The current sample was made up of treatment seeking CSA survivors, therefore the results may not be applicable to the potential large number of individuals who have experience sexual abuse but have not reported their experience. Secondly, the majority of the participants were female (84.5%). It is possible that the findings throughout this thesis are more applicable to females CSA survivors. Future studies should attempt to utilise samples which are more equally distributed in terms of gender. Thirdly, there were a number of individuals who were excluded both from the treatment and the analyses. Individuals with more severe psychological disturbances (such as psychosis and self-destructive behaviour) were not included in the analysis due to the treatment exclusion criteria. Additionally, 17 individuals were excluded from the analyses in all chapters due to having over 20% missing baseline data and a further 91 were excluded from the studies described in Chapters 3 and 4, due to non-valid MCMI-III scores. Unfortunately, the differences between those who were excluded and those who were

included in the studies were not examined. This may have also impacted the results and further reduced the generalizability of the findings. Fourthly, evidence has suggested that the prevalence rates of CSA in Denmark may be lower than that of other countries. For example, Barth et al. (2013) estimated that between 8 and 31% of females and 3 and 17% of males had experienced a form of CSA across 24 countries. However, a national Danish study ($n=4718$) revealed much lower rates of CSA (0.7% of males and 6.41% of female; Christoffersen et al., 2013). If this evidence reflected a true differences in rates of CSA this may reduce the generalizability of the findings in the current sample to other countries. However it is possible that the differences in rates are not a true reflection of reality and are due to differences in reporting rates or methodologies. Fifthly, the individualised nature of the treatment limits the conclusions which can be drawn from the studies. There was a lack of information regarding the treatment plans which were tailored to the individual participant and it is possible that the treatment characteristics influenced both the length of time spent in treatment and how PTSD symptomology changed over time.

8.7 Implications

Despite the limitations described above the findings from this thesis have a number of important implications:

1. The findings of distinct subgroups relating to psychopathology and treatment response highlight the importance of multifaceted assessments.
2. CSA survivors with more severe psychopathology should be considered as potentially having an increased risk of suicide attempts.

3. Children who are known to have experienced sexual abuse should be assessed for social support and coping style following disclosure as this may help to determine modifiable factors which could potentially mitigate negative long-term outcomes.
4. Child victims of CSA who have high levels of emotional coping or poor social support should be offered interventions which attempt to improve these factors.
5. Adult survivors of CSA should also be assessed on emotional coping and social support.
6. Adults who have poor social support or high levels of emotional or detached coping should be offered interventions to improve these factors as this may promote treatment response.
7. Abuse characteristics are an important part of the assessment process. Individuals who have a higher number of cumulative sexual abuse acts should be considered as having an increased risk of developing more severe psychopathology. Individuals who have experienced cumulative trauma (particularly neglect or rape in addition to CSA) should be considered at a greater risk of leaving treatment early.
8. CSA survivors with low levels of education should be considered as having an increased risk of developing psychopathology.
9. It is possible that low education is a barrier to treatment completion. Clinicians should be aware of this and increased support or an alternative treatment may be appropriate.
10. Clinicians should be aware that males may have an increased risk of more severe psychopathology but are likely to spend longer in treatment.

8.8 Further research

In order to make a difference for survivors of CSA further research is required to further understand, outcomes and risk and protective factors in this population. Due the difficulties relating to the generalizability of the current findings, studies using large nationally representative data sets should be conducted. It is however likely that the problem of underreporting sexual abuse would be present as studies have consistently suggested this is a problem within the current population (Barth et al., 2013). This thesis found high rates of co-occurring PTSD, dysthymia, MDD, anxiety and somatoform disorders. However, the underlying mechanisms which explain the high comorbidity rates were not clear. Longitudinal research would be useful in order to establish when each disorder first occurred. The current findings suggested that social support was related to psychopathology and treatment outcomes. However the direction of the relationship could not be established. Longitudinal studies are required to examine how the relationship between social support and psychological adjustment changes over time within this population. Similarly, further studies are required to examine the longitudinal relationship between coping style and psychological and treatment outcomes. A number of potential risk and protective factors were identified. It was suggested that by reducing emotional style coping and improving social support that the risk of developing psychopathology could be decreased and treatment response could be improved. Intervention studies are required to examine whether modifying these factors can have a positive impact among CSA survivors. Finally, given the high rate of co-occurring disorders found in the current thesis, future studies should employ methods such as latent transition analysis to examine the longitudinal course of disorder class membership.

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Appendix 1: Publications relating to the current thesis



Predicting Time Spent in Treatment in a Sample of Danish Survivors of Child Sexual Abuse

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Predicting Time Spent in Treatment in a Sample of Danish Survivors of Child Sexual Abuse

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ABSTRACT

The aim of this study was to identify significant predictors of length of time spent in treatment. In a convenience sample of 439 Danish survivors of child sexual abuse, predictors of time spent in treatment were examined. Assessments were conducted on a 6-month basis over a period of 18 months. A multinomial logistic regression analysis revealed that the experience of neglect in childhood and having experienced rape at any life stage were associated with less time in treatment. Higher educational attainment and being male were associated with staying in treatment for longer periods of time. These factors may be important for identifying those at risk of terminating treatment prematurely. It is hoped that a better understanding of the factors that predict time spent in treatment will help to improve treatment outcomes for individuals who are at risk of dropping out of treatment at an early stage.

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Introduction

Child sexual abuse (CSA) has been defined by the Committee on Professional Practice and Standards for the American Psychological Association (2013, P.30) as “any form of child abuse in which an adult or older adolescent uses a child for sexual stimulation.” CSA is a global phenomenon that occurs across all socioeconomic groups (UNICEF, 2014). A systematic review of 55 studies conducted across 24 countries found that prevalence rates ranged between 8 and 31% for females and between 3 and 17% for males (Barth, Bermetz, Heim, Trelle, & Tonia, 2013). A Danish national study ($n = 4,718$) found that 0.7% of males and 6.41% of females had experienced CSA (Christoffersen, Armour, Lasgaard, Andersen, & Elklit, 2013). There is an extensive body of research providing empirical evidence of the negative consequences of CSA. A longitudinal study ($n = 900$) conducted over 30 years concluded that CSA was associated with an increased risk of mental health problems, physical health problems, low self-esteem, and increased sexual risk taking (Ferguson, McLeod, & Horwood, 2013). Other consequences related to CSA include

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alcohol and drug abuse (Cutajar et al., 2010), revictimization (Arata, 2002), sexual disorders (Kristensen & Lau, 2011), and lower levels of educational attainment and income (Trickett, Negriff, Ji, & Peckins, 2011).

There are a number of evidence-based, trauma-focused treatment models accessible in a variety of treatment settings, and outcome data suggests that this is effective in decreasing trauma-related symptoms in survivors of sexual abuse. Taylor and Harvey (2010) conducted a meta-analysis investigating the effects of psychotherapy in adults who had been sexually abused in childhood. Forty-four studies were analyzed, and it was concluded that psychotherapeutic approaches for the treatment of symptoms associated with CSA was beneficial. Furthermore, these positive effects were still apparent up to 6 months after the treatment. Consistent with this, another meta-analysis concluded that the treatment in youth victims of CSA had a medium effect size in reducing many of the associated trauma symptoms (Trask, Walsh, & DiLillo, 2011). Elklit (2015) examined the effects of psychotherapy in a sample of Danish incest survivors (the same sample as used in the current study). The results demonstrated a significant reduction in symptoms following 12 months of treatment.

Despite the evidence suggesting that therapeutic treatment can be effective, research has shown that high treatment dropout rates are a problem within this population. Chasson, Mychailyszyn, Vincent, and Harris (2013) found that 40% of child abuse victims (aged 5–19 years) had dropped out of treatment by the 6 month point. Another study found that 28% of women prematurely left an expressive writing intervention for sexual abuse survivors (Harte, Hamilton, & Meston, 2013). Furthermore, it has been found that individuals seeking treatment for other problems (including substance abuse) are at increased risk of terminating treatment prematurely if they have a history of childhood sexual or physical abuse (Claus & Kindleberger, 2002). This suggests that CSA survivors may be at a particularly high risk of dropping out of treatment. Premature treatment termination may decrease the positive effects of the treatment, leaving unresolved posttraumatic stress disorder (PTSD) symptoms that in turn are associated with significantly impaired functioning and psychological distress (Breslau, Lucia, & Davis, 2004). In addition to the negative personal impact of treatment attrition, there are also important cost implications. There is evidence of the huge economic burden (including medical and occupational costs as well as functional impairment) that PTSD can have on society (Kessler, 2000), and unresolved symptoms are associated with seeking further treatment (Armbruster & Kazdin, 1994) and increased health care utilization (Tuerk et al., 2013). Given the high treatment attrition rates within childhood trauma samples and the extant literature highlighting numerous problems associated with attrition, understanding factors relating to attrition rates

would be beneficial in establishing the most efficacious treatment plans for this population.

Although previous literature has highlighted factors associated with treatment attrition in childhood trauma survivors, some inconsistencies have been noted; this could be due to differing populations, interventions used, sample size, and outcome measures employed (Harte et al., 2013). CSA survivors that drop out of treatment prematurely have been found to be younger and have a lower socioeconomic status than participants who complete treatment (Cloitre, Chase Stovall-McClough, Miranda, & Chemtob, 2004; Harte et al., 2013). A study that examined the role of trauma characteristics in attrition in a sample of abused children revealed that children who had only experienced one incident of abuse, had been abused by an older child (not an adult), and who had not been physically injured, were at a higher risk of dropping out of treatment (Chasson et al., 2013). Contrary to this, other studies have found that experiencing more severe sexual abuse has been associated with higher rates of dropping out of intervention studies (Lau & Kristensen, 2007; McDonagh et al., 2005).

Psychopathology also has been implicated in the prediction of attrition. Avoidance symptoms have been associated with premature dropout in child and adolescent victims of CSA (Murphy et al., 2013). Consistent with this, increased PTSD symptom severity, personality disorder, and higher levels of depression have all been associated with attrition (McDonagh et al., 2005; Zayfert et al., 2005). This suggests that poor mental health is associated with attrition, and it could be due to a perceived lack of improvement or not having sufficient motivation to attend treatment. On the other hand, positive coping strategies have been found to predict attrition in a sample of female sexual abuse survivors. It was argued that participants with positive coping may already have the tools in place to effectively manage their distress and therefore are not in need of further treatment (Harte et al., 2013).

Although there have been numerous studies examining predictors of attrition in sexual abuse survivors, there have been few that have explored the time that the dropout occurred. In order to understand why survivors of CSA leave treatment, it is important that we know when the dropout occurs, as different factors could affect dropout at different stages of treatment (Gutner, Gallagher, Baker, Sloan, & Resick, 2016). It is also important to note that it should not be assumed that participants who drop out early have not experienced an improvement in symptoms. It has been argued that some individuals who have been classed as “dropping out” may leave treatment because they have responded to and benefited from the treatment received thus far (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). Regardless, understanding attrition and dropout from therapy has important implications for treatment planning. In the current study, time spent in treatment (as opposed to premature dropout) will be examined. The aim of this study is

to examine whether baseline measures are associated with length of time spent in treatment and to identify significant predictors of length of time spent in treatment. Furthermore, social support (Charuvastra & Cloitre, 2008) and secure attachment styles (e.g. Armour, Elklit, & Shevlin, 2011; O'Connor & Elklit, 2008) have found to be protective against the negative consequences associated with CSA, and it is therefore possible they could influence length of time spent in treatment. To the best of our knowledge, these factors have yet to be included in treatment attrition studies in CSA survivors, and their roles will be explored in the current study.

Method

Participants

A convenience sample was derived from participants who were outpatient clients ($N = 456$) of incest treatment centers in Denmark. All participants were Caucasian, and the majority were female (85.8%). The sample were aged between 15 and 77 years old, with a mean age of 36 years ($SD = 10.93$). Exclusion criteria were the presence of an active drug or alcohol problem, psychosis, a personality disorder characterized mainly by perpetrating traits (for example, aggression or causing harm to others) or self-destructive behavior or being in receipt of treatment elsewhere. Excluded participants were referred to the relevant agency for further care where appropriate.

Procedure

Data used in the current study were collected from three treatment centers in Denmark. Each center is supported by the Ministry of Social Affairs and provides free, weekly, individual psychotherapy sessions. Personalized psychotherapy was conducted by psychologists. This method of treatment can involve multiple interventions (including cognitive, psychodynamic, and behavioral treatments) that are matched specifically to the patient depending on underlying personality features thought to be related to the problematic symptoms (Millon, 1999). Treatment plans were based on the scores derived from the initial assessment. There is no specific time frame in which to complete the treatment, and there are no limits on the number of sessions allowed. All participants attending the treatment centers were asked to complete a number of questionnaires during their second therapy session (T1). The assessments were repeated every 6 months over a period of 18 months. The data collection was in line with the Nordic ethics guidelines. All participants gave informed consent, had full anonymity, and were not compensated for participating in this study.

Measures

Length of time in treatment

Continuous variables for the duration or number of treatment sessions were not available. Participants were categorized according to the length of time spent in treatment (T1 = 0–6 months, T2 = 6–12 months, T3 = 12–18 months, and T4 = over 18 months). The participant was considered to have left treatment if there was no data for the current assessment and all subsequent assessments. This allowed for a comparison of participants who dropped out early in treatment (0–6 months) and those who stayed in treatment for longer. No information regarding reason for attrition was available.

Sociodemographic characteristics

The following sociodemographic characteristics were included in the analyses: sex (female reference group), age, and total years of education (both continuous measures). Ethnicity was not included as there was no variation among participants.

Abuse characteristics

Participants were asked a number of questions about the abuse they experienced. All questions had yes (1) and no (0) response options. For the analysis, we created three variables to categorize the type of abuse experienced: noncontact abuse, contact with no penetration, and penetrative sexual abuse. Noncontact abuse included being questioned about sex, teased about sexuality, being made to watch pornography, spoken to about sexual acts, being made to listen to other's sexual experiences, being asked to take part in sexual acts, having to watch someone expose themselves, or being made to expose oneself to others. Contact with no penetration included kissing, sexual touching (genital or other), being made to touch the genitals of a perpetrator, and being made to masturbate or engage in reciprocal masturbation. Last, penetrative sexual abuse included attempted or actual sexual intercourse (genital, oral, or anal). Participants were asked their age at onset of sexual abuse, how long the abuse continued and how the perpetrator knew them (e.g., mother, father, sibling, etc.). Participants were also asked questions about other potential traumas they experienced. The questions were dichotomous and were based the trauma measure used in the National Comorbidity Survey (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Traumas included lifetime violent assault (*seriously physically attacked or assaulted*), lifetime rape (*someone had sexual intercourse with you when you did not want to by threatening you or using a degree of force*), and childhood neglect (*you were seriously neglected as a child*).

The Harvard Trauma Questionnaire

The HTQ-IV (Mollica et al., 1992), a 16-item scale, measures overall PTSD symptomology and consists of three subscales: reexperiencing, avoidance, and arousal symptoms. Each item is measured on a 4 point Likert scale ranging from *not at all* to *all the time*. Previous studies have reported that this scale demonstrates good reliability in measuring the symptoms of PTSD (Cronbach's alpha coefficients range from 0.84–0.94; Hansen & Elklit, 2013). In the current study, the Cronbach's alpha coefficients were 0.64–0.82. In addition, the HTQ-IV has been widely validated in Denmark (Bach, 2003).

The Trauma Symptom Checklist

The TSC-33 (Briere & Runtz, 1989; Elklit, 1990), a 35-item scale containing 2 additional items to the original 33-item scale (Elklit, 1990), measures a range of symptoms following a traumatic event. Each item is measured on a four point Likert scale ranging from *never* to *very often*. The sum of all items measures overall distress; the subscales utilized in this study include those measuring depression, dissociation, anxiety, sleep disturbance, somatization, interpersonal sensitivity, and general hostility. Elklit (1990) found that all subscales demonstrate good reliability (Cronbach's alpha coefficients = 0.68–0.95), and in this study, the Cronbach's alpha coefficients ranged from 0.64–0.82. The TSC-33 also demonstrates good factor and criteria validity (Krog & Duel, 2003).

The Revised Adult Attachment Scale

The RAAS (Collins, 1996; Collins & Read, 1990) scale has 18 items that are all measured on a 5 point Likert scale ranging from *not at all* to *very characteristic of me*. The current analysis utilized the categorical attachment styles: secure, avoidant, anxious ambivalent, and fearful. The scale has been found to have adequate reliability (Cronbach's alpha coefficients = 0.51–0.71; Collins & Read, 1990) and the Danish version of the scale has been validated (Pedersen, 2006). The Cronbach's alpha coefficients for the current study ranged from 0.68–0.75.

Crisis Support Scale

The CSS (Joseph, Andrews, Williams, & Yule, 1992) scale measures perceived social support with 7 items that are measured on a 7 point Likert scale, ranging from *never* to *always*. In this study, perceived social support at T1 and at the time of the abuse was measured. Evidence has shown that the scale has moderate to good reliability (Cronbach's alpha coefficients = 0.67–0.82) and good validity (Elklit, Pedersen, & Jind, 2001). In the current study, the Cronbach's alpha coefficients were 0.73 for both social support at T1 and at the time of the abuse.

The Coping Style Questionnaire

The CSQ (Roger, Jarvis, & Najarian, 1993) scale consists of 37 items, each of which is measured on a 4 point Likert scale ranging from *never* to *always*. The subscales derived from the 37 items include the following coping styles: avoidant, emotional, detached, and rational. Validation has confirmed that there are 4 clusters (Elklit, 1992) and the Cronbach's alpha coefficients have been reported as rational = 0.70, emotional = 0.75, avoidant = 0.65, and detached = 0.43 (O'Connor & Elklit, 2008). In the current study, the Cronbach's alphas ranged from 0.65–0.85.

Missing data

Prior to the data analysis, missing data were examined for exclusions. Participants with over 20% of missing data on baseline measures (17 participants) were excluded from the analysis. In addition, missing data analyses of the baseline predictor variables was conducted using SPSS version 21, prior to exporting the data to Mplus 7.3 (Muthén & Muthén, 2014) for the regression analysis. The results indicated that 97% of values in the data set were complete. Stage 1 of the analyses was conducted using this dataset. Little's MCAR test suggested that the remaining missing baseline values were missing completely at random ($\chi^2 = 3381.24, 238, p = 0.18$). For stage 2 of the analysis, all missing values on the baseline measures were estimated in Mplus (Muthén & Muthén, 2014). Mplus makes use of cases with incomplete data whereby missing data is estimated based on the values of the covariates in the model using full information maximum likelihood (Schafer & Graham, 2002).

Statistical analyses

SPSS was used to conduct chi-square tests (for the dichotomous variables) and one way ANOVA's (for the continuous variables) in order to identify variables that were significantly associated with length of time spent in treatment. Multinomial logistic regression analysis was conducted using Mplus (Muthén & Muthén, 2014) to examine the association between baseline predictor variables (both binary and continuous) and length of time spent in treatment (0–6, 6–12, 12–18 or 18+ months). The reference class was 0–6 months. The associations were expressed as odds ratios and their 95% confidence intervals. A set of demographic variables (sex, age, and total years of education) were selected for inclusion in the regression models in addition to the variables that had a significant relationship with the dependant variable in the initial analyses (a value of $p < 0.05$). The robust maximum likelihood estimator was used for all of the regression analyses. Maximum likelihood estimators are asymptotically efficient and consistent in large samples (Bollen, 1989) and are appropriate for data that does not meet the

assumption of multivariate normality (Satorra & Bentler, 1994; Yuan & Bentler, 2000).

Results

Length of time spent in treatment

Of the initial 439 participants, 128 (29.15%) spent 0–6 months in treatment, 116 (26.42%) spent 6–12 months in treatment, 85 (19.36%) spent 12–18 months in treatment, and 110 (25.06%) were still attending treatment at 18 months.

Stage 1

Table 1 shows the results of the ANOVA together with descriptive statistics of all continuous baseline measures for the full sample and for each group. The groups were categorized according to length of time spent in treatment. The results revealed that years of education and hostility had a significant effect on length of time in treatment. The chi-square tests showed no

Table 1. Descriptive Statistics of Baseline Measures for Total Sample and Groups of Participants Categorized by Time in Treatment.

Variable	Total Mean (SD)	0–6 months Mean (SD)	6–12 months Mean (SD)	12–18 months Mean (SD)	18+ months Mean (SD)	F
N	439	128	116	85	110	—
Age	36.46 (10.83)	35.95 (11.64)	35.42 (10.13)	36.41 (10.94)	38.21 (10.42)	1.4
Education	13.44 (3.51)	12.58 (3.11)	13.46 (3.28)	14.18 (2.98)	13.87 (4.33)	3.73**
Start of abuse	6.61 (4.26)	6.36 (4.43)	6.02 (4.31)	7.3 (4.04)	7.06 (4.13)	1.69
End of abuse	13.32 (7.38)	14.32 (8.44)	12.26 (7.55)	12.43 (4.59)	13.98 (7.92)	1.48
Social support (during abuse)	11.97 (6.21)	12.38 (6.14)	12.87 (6.28)	11.52 (6.67)	10.98 (5.75)	1.72
Social support (T1)	29.66 (7.59)	30.15 (7.63)	30.89 (7.19)	29.89 (7.39)	29.61 (7.63)	0.53
PTSD (HTQ16)	45.34 (7.91)	46.42 (8.35)	45.41 (8.57)	45.58 (6.93)	45.71 (8.17)	0.31
Reexperiencing	10.44 (2.84)	10.55 (2.84)	10.51 (2.79)	10.31 (2.73)	10.33 (2.3)	0.21
Avoidance	19.51 (4.09)	19.39 (4.17)	19.49 (4.19)	19.72 (3.38)	19.52 (4.44)	0.11
Arousal	15.39 (2.97)	15.80 (2.79)	15.14 (3.23)	15.25 (2.84)	15.61 (2.84)	1.28
Avoidant coping	21.4 (4.38)	22.33 (5.03)	21.61 (4.18)	21.34 (3.92)	21.31 (3.57)	1.35
Detached coping	10.75 (2.82)	11.23 (2.92)	10.91 (2.95)	10.47 (2.68)	10.87 (2.67)	1.16
Rational coping	23.83 (5.13)	24.29 (5.23)	24.83 (5.14)	23.36 (4.27)	24.19 (4.86)	1.26
Emotional coping	24.62 (5.84)	24.58 (5.95)	24 (6.05)	25.51 (5.98)	25.32 (5.29)	1.38
Depression	24.17 (5.19)	24.59 (5.42)	23.93 (5.19)	24.06 (4.88)	24.9 (5.11)	0.79
Anxiety	16.86 (4.68)	17.42 (5.1)	16.68 (4.47)	16.91 (4.75)	16.57 (4.3)	0.77
Somatization	15.26 (4.15)	15.67 (4.58)	15.25 (3.89)	15.12 (4.22)	14.89 (3.86)	1.07
Sleeping	9.76 (3.19)	9.77 (3.24)	9.54 (3.22)	9.59 (3.01)	10.1 (3.25)	0.85
Dissociation	14.98 (4.26)	15.41 (4.62)	15.26 (4.37)	14.95 (4.14)	14.5 (3.88)	0.96
Hostility	7.31 (2.29)	7.7 (2.48)	7.51 (2.29)	6.98 (1.85)	6.94 (2.27)	3.12*
Sensitivity	14.4 (3.73)	14.78 (3.95)	14.38 (3.53)	14.21 (3.51)	14.12 (3.83)	0.57

* $p < 0.05$, ** $p < 0.005$.

Table 2. Odds Ratios (95% Confidence Intervals) for the Predictors of Time in Treatment.

Predictors	6–12 months	12–18 months	18+ months
Male	1.39 (0.58–3.31)	2.85 (1.27–5.61)*	1.01 (0.63–3.27)
Education	1.05 (0.97–1.14)	1.12 (1.04–1.21)**	1.09 (1–1.19)*
Age	1 (0.97–1.02)	1 (0.97–1.03)	1.02 0.99–1.04
Rape	0.55 (0.29–1.01)*	1.35 (0.72–2.52)	0.97 (0.54–1.74)
Neglect	0.69 (0.39–1.2)	0.45 (0.25–0.84)*	0.68 (0.38–1.21)
Hostility	1.06 (0.94–1.2)	0.89 (0.78–1.02)	0.91 (0.79–1.03)

* $p < 0.05$, ** $p < 0.005$.

significant association between time in treatment and reporting to the police, attending a court case, prosecution of the perpetrator, marital status, relationship with the perpetrator, or attachment style. Being male was associated with staying in treatment for 12–18 months when compared to all other categories ($\chi^2 = 8.71$, 3, $P < 0.05$). The experience of childhood neglect ($\chi^2 = 9.481$, 3, $P < 0.05$) and rape at any life stage ($\chi^2 = 6.87$, 3, $P < 0.05$) were both associated only with staying in treatment for 0–6 months.

Stage 2

A multinomial logistic regression was performed in order to identify significant predictors of length of time spent in treatment. Significant variables from stage 1 of the analyses were included in the regression model in addition to age (a preselected demographic variable). Participants who spent 6–12 months, 12–18 months, and over 18 months in treatment were compared to participants who only spent 0–6 months in treatment. The results of the regression are shown in Table 2. The odds of spending 6–12 months attending treatment were decreased by experiencing rape ($OR = 0.55$, 95% CI : 0.29–1.01). The odds of attending treatment sessions for 12–18 months were increased by higher educational attainment ($OR = 1.12$, 95% CI : 1.04–1.21; odds increase by 12% with each additional year of education) and by being male ($OR = 2.85$, 95% CI : 1.27–5.61). Odds were decreased by the experience of childhood neglect ($OR = 0.45$, 95% CI : 0.25–0.84). The odds of staying in treatment for over 18 months were significantly increased by higher educational attainment ($OR = 1.09$, 95% CI : 1–1.19; odds increase by 9% with each additional year of education).

Discussion

The primary aim of the study was to identify factors that could predict length of time Danish survivors of CSA remained in treatment. Participants were categorized according to the length of time they spent in treatment, thus allowing for the comparison of participants who spent less than six months in treatment to participants who stayed in treatment for a longer period of time. Despite lack of information regarding reasons for treatment termination, this study did

identify four variables that were found to significantly predict length of time spent in treatment: sex, education, experiencing rape (at any stage of life), and experiencing childhood neglect.

Demographic characteristics

Previous research has found that younger age predicted early treatment dropout (e.g. Cloitre et al., 2004; Swift & Greenberg, 2012); the results of this study, however, suggest that age is not associated with time in treatment. Higher educational attainment, on the other hand, was found to be associated with staying in treatment longer periods of time (12–18 and 18+ months when compared to 0–6 months). This finding is consistent with previous studies that have shown that less education is associated with early treatment termination in patients seeking treatment for social anxiety (Coles, Turk, Jindra, & Heimberg, 2004), panic disorder (Keijsers, Kampman, & Hoogduin, 2001), and PTSD (Rizvi, Vogt, & Resick, 2009). This finding has also been replicated with CSA survivors in treatment (Harte et al., 2013). One possible explanation for these results could be explained by the link between low educational attainment and low economic status. Lorion (1974) suggested that economically disadvantaged individuals are more likely to approach problems in a way that is “crisis reactive,” meaning only problems that reach a critical level are addressed; once the severity and the immediacy of the problem are reduced, treatment is no longer a priority and the individual may withdraw from in order to attend to other critical needs. Based on this theory it has been suggested that patients would be more likely to stay in treatment if they feel that the need is constant across time (Ogrodniczuk, Joyce, & Piper, 2005). In light of these ideas about treatment withdrawal within this population, a different approach may be required to support such individuals remaining in treatment. One review of attrition in psychotherapy for those with mental health problems suggests that individuals with less education could be taught the specific skills that facilitate treatment completion, and a brief therapy method could be utilized for treatment completion within a shorter time period (Barrett et al., 2008).

Our results also revealed that males were more likely to stay in treatment for a longer period of time than females (12–18 months when compared to 0–6 months). This finding was surprising, as previous research has suggested that male and female interpersonal assault survivors improve at a similar rate (Galovski, Blain, Chappuis, & Fletcher, 2013). However, it is possible that within this population females responded more quickly to treatment and therefore did not require treatment for as long as the males. Consistent with this argument, one study found that females were likely to experience an increased benefit of psychological treatment after a six month period when compared to males (Tarrier, Sommerfield, Pilgrim, & Faragher, 2000), and there is evidence suggesting that females are more likely to maintain improvement in PTSD symptoms following

treatment (Felmingham & Bryant, 2012). The result in the current study requires further investigation in order to understand why males in this sample were more likely than females to stay in treatment longer.

Abuse characteristics

Notably, the type of childhood sexual abuse (noncontact, contact, and penetrative) was not found to be predictive of time in treatment. However, the regression analysis did indicate that the experience of rape (at any life stage) was associated with decreased odds of staying in treatment for 6–12 months. This result suggests that the experience of rape may be predictive of leaving treatment within the first 6 months, although previous research examining the role of abuse characteristics has been inconsistent. Several studies have found that more severe and frequent sexual abuse and a higher number of perpetrators were associated with early treatment dropout (Lau & Kristensen, 2007; McDonagh et al., 2005). In contrast, another study found that less severe abuse predicted dropout in a sample of abused youth (Chasson et al., 2013). Another study found no relationship between abuse characteristics and withdrawal from treatment (Tarrier et al., 2000). Given these inconsistencies, further research is warranted to better understand which abuse characteristics may influence length of time in treatment.

In our analysis, the experience of childhood neglect also was associated with leaving treatment early. Previous research has suggested that experiencing multiple types of trauma in childhood is associated with increased psychological problems. For example, Shevlin, Houston, Dorahy, and Adamson (2008) examined the effect of cumulative trauma on psychosis using two large community samples. The study found that experiencing two or more different types of traumas predicted psychosis, and a dose response relationship was demonstrated. In addition, exposure to a greater number of adversities in childhood has been found to be related to increased psychopathologies such as depression and anxiety and to suicidality and criminality (Elklit, Karstoft, Armour, Feddern & Christoffersen, 2013; Horan & Widom, 2015; Petersen, Armour & Elklit, 2013). More recently, Steine and colleagues (2017) examined the effects of cumulative trauma on adult health in adult CSA survivors and found a dose response relationship between the number of types of childhood trauma experienced and risk behaviors and disease in adulthood. Experiencing an increased number of categories of trauma in childhood was associated with an increased risk of experiencing alcohol and drug problems, depression, suicidality, poor self-rated health and poor physical health in adulthood. If the outcomes for individuals who have experienced multiple traumas are more severe, it is worrying that individuals who are survivors of both CSA with rape and/or neglect are more likely to drop out of treatment within the first six months.

This argument is consistent with Hembree and Foa's (2003) review of trauma interventions, which suggested that those who needed the therapy the most were more likely to drop out of treatment early. Clinicians should be aware of this finding and further investigation is warranted to understand how to better support these individuals to stay in treatment.

Psychopathology

Contrary to previous research, which has suggested more severe psychopathology predicts attrition (e.g. Zayfert et al., 2005), the current study found no association between this characteristic and time spent in treatment. Surprisingly, there were no significant differences between participants who stayed in treatment for any length of time in relation to symptoms of PTSD, depression, anxiety, somatization, sleeping problems, or dissociation. Although hostility was found to be associated with leaving treatment in the first six months, it was not found to be a significant predictor in the regression analyses. This evidence suggests that psychopathology may not be an effective factor to determine risk of early attrition from treatment.

Attachment, social support, and coping style

To date there has been no significant research examining the role of attachment and social support in CSA treatment attrition. This study found that neither attachment style nor social support (current or at the time of the abuse) were associated with length of time spent in treatment in the initial analysis. One recent study found that positive coping styles predicted attrition in female CSA survivors (Harte et al., 2013). It was suggested that this could be due to the positive coping strategies already in place for those participants, thus rendering a view of themselves as being less in need of treatment for management of the negative consequences of their trauma. Contrary to this idea, the current study found that emotional, rational, detached, or avoidant coping styles were not associated with time spent in treatment. These results suggest that social support, coping style, and attachment style may not play a significant role in determining risk of leaving treatment early.

Conclusions

The relationship between both childhood neglect and lifetime rape with length of time in treatment was analyzed, and the results demonstrated that in this sample, early neglect and experiencing rape were found to be predictive for staying in treatment for less than six months. This finding is worrying, as these individuals with a history of multiple traumas may have worse outcomes (e.g. Shevlin et al., 2008) and have an increased need for treatment. In addition, being male and greater educational attainment were found to be associated with staying in

treatment for longer. Given these findings, clinicians should be aware of the factors likely to predict time spent in treatment in order to identify individuals who may be at risk of dropping out at an early stage. Treatment modifications are suggested to increase completion rates of treatment, specifically in patients with less education and who have experienced multiple traumas (particularly CSA with neglect and/or rape), if it is deemed beneficial for the individual. It is possible that these patients are in greater need of treatment, and by addressing the potential for early treatment dropout, clinicians may improve outcomes for their patients. More effective treatment will result in not only a reduction in distressing trauma-related symptoms, thus increasing productivity and enhancing the quality of life for those patients, but treatments will be more cost-effective and accessible to those in need.

Strengths and limitations

The current study utilized a large longitudinal data set with consecutive outpatients receiving treatment for trauma-associated symptoms. The current study has identified factors that could be used to predict risk of early withdrawal from treatment. However, results of this study should be interpreted in light of several limitations. Of concern is that there was no information gathered regarding number of treatment sessions each participant attended, therefore the exact point of dropout within each six month period cannot be determined. In addition, reasons for attrition were not identified in this sample, thus it is not known if participants left treatment due to feeling better or due to a lack of improvements. Childhood abuse was measured using retrospective self-reports; although data gathered in this manner may not be as reliable, at least one study has demonstrated that retrospective self-reports of sexual abuse were found to have good convergent validity with clinical case notes, and reports remained consistent over a period of seven years (Fisher et al., 2013). This suggests that retrospective reports of abuse have reliability and validity and as such are adequate ways to gather data regarding histories of abuse. In the current study, there was no specified time during which treatment was to be completed; therefore, it could not be determined whether participants terminated treatment due to a lack of improvement or due to feeling better and no longer requiring treatment instead of examining dropout. Elklit (2015) studied the same sample used in the current study and found that the greatest improvements in symptoms occurred within the first six months, with substantial improvements in mental health symptoms after one year of treatment. However, it was suggested that there were still some improvements to be made even after one year of treatment (Elklit, 2015). This may suggest that after six months of treatment, some participants had improved significantly and left treatment at that stage due to treatment success.

Future studies should consider the limitations herein and focus on continued exploration of specific traits that may predict treatment dropout in this

population. Given the positive outcomes reported in those who complete treatment after experiencing traumatic events, this information is essential for clinical efficacy and effectiveness of treatment planning. Further research should include posttreatment reasons for dropout where possible, as this may help to disentangle the patients who end treatment because they have benefitted from it versus those who drop out for other reasons.

Compliance with ethical standards

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

Conflict of interest

All authors declare that they have no competing interests.

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Predictors of PTSD Treatment Response Trajectories in a Sample of Childhood Sexual Abuse Survivors: The Roles of Social Support, Coping, and PTSD Symptom Clusters

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Abstract

This study aimed to (a) identify posttraumatic stress disorder (PTSD) trajectories in a sample of Danish treatment-seeking childhood sexual abuse (CSA) survivors and (b) examine the roles of social support, coping style, and individual PTSD symptom clusters (avoidance, reexperiencing, and hyperarousal) as predictors of the identified trajectories. We utilized a convenience sample of 439 CSA survivors attending personalized psychotherapy treatment in Denmark. Four assessments were conducted on a six monthly basis over a period of 18 months. We used latent class growth analysis (LCGA) to test solutions with one to six classes. Following this, a logistic regression was conducted to examine predictors of the identified trajectories. Results revealed four distinct trajectories which were labeled high PTSD gradual response, high PTSD treatment resistant,

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moderate PTSD rapid response, and moderate PTSD gradual response. Emotional and detached coping and more severe pretreatment avoidance and reexperiencing symptoms were associated with more severe and treatment resistant PTSD. High social support and a longer length of time since the abuse were associated with less severe PTSD which improved over time. The findings suggested that treatment response of PTSD in CSA survivors is characterized by distinct patterns with varying levels and rates of PTSD symptom improvement. Results revealed that social support is protective and that emotional and detached coping and high pretreatment levels of avoidance and reexperiencing symptoms are risk factors in relation to PTSD severity and course. These factors could potentially identify patients who are at risk of not responding to treatment. Furthermore, these factors could be specifically addressed to increase positive outcomes for treatment-seeking CSA survivors.

Keywords

sexual abuse, child abuse, PTSD, treatment

Introduction

There is a plethora of evidence suggesting that childhood sexual abuse (CSA) is a risk factor for a wide range of long-term negative effects, including substance and alcohol abuse (Cutajar et al., 2010), revictimisation (Arata, 2002), and physical and mental health disorders (Fergusson, McLeod, & Horwood, 2013). Posttraumatic stress disorder (PTSD) as a consequence of CSA has been widely studied, and it has been estimated that between 37% and 43% of individuals who experienced CSA meet the criteria for PTSD (Paolucci, Genuis, & Violato, 2001). Some individuals will require treatment for their trauma-related symptoms. A range of evidence-based psychological treatments, such as trauma-focused group therapy (Cole, Sarlund-Heinrich, & Brown, 2007), cognitive behavioral therapy (CBT; Cloitre, Koenen, Cohen, & Han, 2002), and cognitive processing therapy (CPT; Chard, 2005), have found to be effective in reducing trauma-associated symptoms. Indeed, one meta-analysis of 44 studies (comprising 59 treatment conditions) found moderate effect sizes relating to PTSD improvement among adults attending treatment for CSA-related psychopathology ($g = 0.72-0.77$; Taylor & Harvey, 2010).

Although there have been a number of studies and subsequent meta-analyses exploring changes in PTSD over the course of treatment among CSA survivors, many studies have examined how PTSD changes over time by

using methods which assume a homogeneous population (Chard, 2005; Cloitre et al., 2002; Cole et al., 2007; Taylor & Harvey, 2010). These methods, however, do not reflect differential treatment response trajectories. Recently, there has been an increase in the number of studies which have identified distinct subgroups which differ in terms of levels and rates of treatment response. In addition, these studies have examined predictors of group membership. It has been suggested that identifying distinct subgroups could lead to treatment which is more tailored, as survivors who may require a more intensive or alternative therapy could be identified at an early stage (Elliott, Biddle, Hawthorne, Forbes, & Creamer, 2005). Furthermore, examining predictors of class membership could potentially identify risk or protective factors which could be targeted during treatment.

One study examining CPT treatment response in a sample of female victims of interpersonal violence found two distinct trajectories. One group (87%) was characterized by a reduction in PTSD symptoms and the second group (13%) was characterized by PTSD symptoms which did not significantly improve over time (Stein, Dickstein, Schuster, Litz, & Resick, 2012). Participants who received only a cognitive component of CPT or a written account component of CPT (compared with those who received full CPT), as well as individuals with major depression or severe hyperarousal symptoms, were more likely to be in the class which did not significantly improve over time (Stein et al., 2012). Another study examined treatment response, using a sample of 805 veterans who completed a residential program for the treatment of PTSD symptoms. Three trajectories were identified: one group (48.8%) of participants demonstrated significant reductions in PTSD symptoms which were maintained at the follow-up, the second group (41%) had high levels of PTSD which did not improve over time, and the third group (10.2%) had low levels of PTSD symptoms which remained stable over time (Currier, Holland, & Drescher, 2014). This study also revealed that individuals who had symptoms which responded to treatment had intermediate levels of symptom severity, mental and physical health, and combat exposure when compared with individuals who had symptoms which did not respond to treatment (Currier et al., 2014). More recently, Steine et al. (2017) examined posttraumatic symptom trajectories among adult CSA survivors who had attended a support center (offering support including information and the opportunity to attend support groups). Two trajectories were identified: one was characterized by subclinical PTSD which decreased over time and another was characterized by clinical PTSD which only decreased slightly over time. This study also found that individuals in the clinical PTSD class had experienced more severe abuse and had higher levels of relationship difficulties and lower levels of perceived social support (Steine et al., 2017).

The studies described above have highlighted that there are distinct unobservable subgroups relating to the longitudinal course of PTSD. Although one study (Steine et al., 2017) has identified PTSD trajectories among CSA survivors, there are no known studies which have identified PTSD treatment response trajectories within this population.

Research has also evidenced that factors such as social support (Karstoft, Armour, Elklit, & Solomon, 2013; Steine et al., 2017), coping style (Elklit, 2015; Filipas & Ullman, 2006; Karstoft, Armour, Elklit, & Solomon, 2015; Spaccarelli, 1994), and PTSD symptom clusters (Stein et al., 2012) can influence PTSD course and severity. It is plausible that protective and risk factors associated with PTSD development and maintenance are also able to explain variance in treatment response trajectories among CSA survivors. To the best of our knowledge, these factors have not been studied specifically in relation to PTSD treatment response trajectories among CSA survivors. This gap in the literature will be addressed in the current study.

Coping style has been described by Lazarus and Folkman (1984) as the behavioral and cognitive efforts used to manage both external and internal stressors and demands. Emotion-focused coping aims to reduce internal stress via methods such as using distraction drugs, alcohol, and reappraisal. On the contrary, problem-focused coping (or rational coping) aims to minimize external stress via directly addressing the problem (Lazarus & Folkman, 1984). Other coping styles which have been conceptualized include detached coping (e.g., feeling independent from the circumstances) and avoidant coping (e.g., daydreaming about when things were better; Roger, Jarvis, & Najarian, 1993). Coping style has consistently been found to explain variance in long-term functioning in trauma populations (e.g., Elklit, 2015; Karstoft et al., 2015). Research has shown that emotional and avoidance coping are associated with more severe and chronic PTSD (Karstoft et al., 2015). One recent longitudinal study found that less use of emotional coping in veterans was associated with lower odds of being in the chronic PTSD trajectory (Karstoft et al., 2015). Similar results have also been evidenced in CSA survivors (Elklit, 2015). In contrast, problem-focused coping has been found to be protective (Coffey, Leitenberg, Henning, Turner, & Bennett, 1996). Recently, Karstoft et al. (2015) found that veterans who had higher levels of problem solving coping had decreased odds of membership in both the chronic and worsening PTSD classes. Problem-focused coping has also been found to be associated with less psychological distress in adult CSA survivors (Coffey et al., 1996). The evidence above suggests that emotional and avoidant coping is associated with increased risk and rational coping is protective. It has been argued that individuals who use emotional and avoidance coping methods find it more difficult to process the negative trauma-related emotions, thus maintaining

PTSD and making it more difficult to recover (Ehlers & Clark, 2000). On the contrary, individuals who use problem-focused coping methods are more able to process such emotions (Ehlers & Clark, 2000).

Social support has also been found to influence the development and maintenance of PTSD (Karstoft et al., 2013). Social support has been described as material and psychological resources which can increase an individual's capacity to cope with stress (Cohen & Wills, 1985). Two meta-analyses both concluded that low levels of perceived social support was one of the strongest predictors of PTSD development (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Consistent with this, higher perceived social support has been shown to predict PTSD recovery in veteran samples (Karstoft et al., 2013; Koenen, Stellman, Stellman, & Sommer, 2003). Furthermore, studies of CSA populations have identified social support as a protective factor against PTSD symptom development (Elklit, 2015; Tremblay, Hébert, & Piché, 1999). The stress buffering hypothesis asserts that social support buffers high stress levels which can protect against maladaptive behavior and symptom development (Cohen & Wills, 1985). Tremblay, Hébert, and Piché (1999) argued that social support can influence the cognitive evaluation of the traumatic event and this in turn can reduce the reaction of the victim. Consistent with this theory, Spaccarelli and Kim (1995) found that parental support was associated with higher social competence, lower psychopathology and stress, and negative appraisals in female victims of CSA. The evidence described suggests that social support may protect against PTSD symptom development; furthermore, it has been found to be associated with recovery. Alternatively, it has been suggested that PTSD can have a negative impact on social relationships. For example, one study found that more severe PTSD predicted marital problems and low relationship satisfaction (Campbell & Renshaw, 2013).

In the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000), PTSD was characterized by three symptom clusters. These are avoidance and numbing, reexperiencing, and hyperarousal. The criteria have recently been updated and a fourth symptom cluster (negative alterations in cognition and mood) has been added (*Diagnostic and Statistical Manual of Mental Disorders* [5th ed.; *DSM-5*; APA, 2013]). The roles of individual PTSD symptom clusters have been implicated in the overall severity of PTSD. However, there have been some inconsistencies in the findings. For example, Schell, Marshall, and Jaycox (2004) found that arousal symptoms predicted severity of all other symptoms at 3- and 12-month assessments. Consistent with these results, Stein et al. (2012) revealed that hyperarousal symptom severity predicted the trajectory characterized by little improvement when

attending treatment. The authors suggested that the arousal symptoms are distracting and that this could interfere with treatment engagement (Stein et al., 2012). However, other studies have suggested that reexperiencing symptoms are the most clinically relevant (Creamer, Burgess, & Pattison, 1992). It has been postulated that high levels of reexperiencing and hyperarousal reinforce the learning that occurred during the traumatic experience, contributing to the development and maintenance of PTSD (Shalev, 2002). Contrary to the above, there is also evidence which suggests that avoidance and numbing predict overall PTSD (Hyland et al., 2016). Indeed, it has been argued that avoidance is used as an attempt to reduce the stress associated with hyperarousal and reexperiencing, however, in the long-term it maintains the PTSD (Clark & Beck, 2010). Overall, the results with regard to PTSD symptom clusters and PTSD severity and course have been inconsistent and further research is required. Further understanding of which symptoms are important in predicting treatment response would have important theoretical and clinical implications. Finally, trauma characteristics (e.g. Steine et al., 2017) and demographic factors (e.g. Ullman & Filipas, 2005) have been found to influence PTSD symptomology. Therefore, the current study will also include trauma (length of time since the trauma occurred and whether the participant experienced an additional trauma) and demographic (age, sex and education) variables in the analysis.

Taken together, the extant literature suggests that there are qualitatively distinct patterns of longitudinal PTSD and that coping, social support, and PTSD symptoms clusters are important predictors of long-term PTSD course and severity. To the best of our knowledge, these factors have not been examined as predictors of PTSD treatment response trajectories in CSA survivors. The current study aims to (a) identify PTSD trajectories in a sample of Danish treatment-seeking CSA survivors and (b) examine predictors of the identified trajectories. Based on previous research, we predict that there would be an overall decrease in PTSD symptom scores. We also predicted that there would be multiple and differing trajectories relating to treatment response. Furthermore, we predict that emotional coping will be associated with treatment resistance and social support and rational coping will be associated with treatment response. No specific predictions were made with respect to PTSD symptom clusters.

Method

Participants

Participants ($N = 456$) were outpatients attending treatment centers for survivors of CSA in Denmark. After exclusions due to missing data (discussed below), the effective sample size was 439. The mean age of the sample was

36.46 years (range = 15-77; $SD = 10.83$); all participants were Caucasian and the majority (85.8%) were female. The mean number of years spent in education was 13.44 ($SD = 3.51$). The mean age that the abuse started was 6.62 years ($SD = 4.26$), and the mean age the abuse ended was 13.32 years ($SD = 7.38$). Participants presenting under the influence of drugs or alcohol, or with a personality disorder characterized mainly by perpetrating traits, self-destructive behavior, psychosis, or receiving treatment elsewhere were excluded and referred to another relevant agency.

Procedure

Personalized psychotherapy was conducted by psychologists. This method of treatment can involve multiple interventions (including cognitive, psychodynamic, and behavioral treatments) that are matched specifically to the patient depending on underlying personality features thought to be related to the problematic symptoms (Millon, 1999). There is no common treatment manual, and treatment plans are based on the scores derived from the initial assessments. Treatment was free, individual, and weekly and there was no limit to the number of sessions offered. During the second therapy session (T1), all participants attending completed a number of questionnaires. These questionnaires were repeated at 6 months (T2), 12 months (T3), and 18 months (T4). Continuous variables for the duration or number of treatment sessions were not available; however, only those who had been regularly participating in therapy received the assessments.

Measures

Demographics. The following sociodemographic characteristics were included in the current analysis: total education and age (both continuous scores measured in years) and sex (male reference group).

Trauma characteristics. Participants were also asked about other traumas they had experienced, including rape, physical assault, life threatening accident, fire, flood or natural disaster, physically abused as a child, neglected as a child, witnessed another person being seriously injured or killed, threatened, held captive or kidnapped. Each question had a yes or no response option and a single dichotomous variable was created. Individuals were also asked the length of time in years since the end of the abuse.

Harvard Trauma Questionnaire (HTQ). PTSD symptoms were measured using part IV of the Danish HTQ (Mollica et al., 1992). This section is comprised of 30 items, the first 16 of which correspond to the PTSD symptoms in the

DSM-IV-TR (APA, 2000). Each item is scored on a 4-point Likert-type scale ranging from 'not at all' to 'all the time.' The first 16 items were summed together giving a score ranging from 0 to 64. This score of overall PTSD severity was used to estimate the trajectories. The standard cutoff score for a probable PTSD diagnosis is a mean score of 2.5 or a total score of 40 (Mollica et al., 1992). In addition, there are three subscales: hyperarousal, reexperiencing, and avoidance. These were included in the regression analysis. Part IV of the HTQ has been validated in Denmark (Bach, 2003) and has been found to have good reliability and criterion validity (Mollica et al., 1992).

The Coping Styles Questionnaire (CSQ). The CSQ (Roger et al., 1993) was used to measure coping strategies used. The version used in the current study has 37 items, all of which are scored on a 4-point Likert-type scale ranging from *never* to *always*. Validation of the CSQ has confirmed there are four clusters (Elklit, 1996). These are emotional, avoidance, rational, and detached coping. O'Connor and Elklit (2008) reported the following Cronbach's alpha coefficients: rational = 0.7, emotional = 0.75, avoidance = 0.65, detached = 0.43.

Crisis Support Scale (CSS). The CSS (Joseph, Andrews, Williams, & Yule, 1992) was used to measure perceived social support both during the time of the trauma and at baseline. There are seven items each of which is measured on a 7-point Likert-type scale ranging from *never* to *always*. The scale has been found to have good internal consistency (Cronbach alphas range between 0.67 and 0.82) and good discriminatory power (Elklit, Pedersen, & Jind, 2001).

Missing Data and Attrition

Participants with over 20% of all baseline values missing were excluded from the analysis. We conducted multiple imputation to handle all missing HTQ scores over all four time points. Multiple imputation replaces the missing scores with plausible estimations based on the values of observed variables, with standard errors taking the uncertainty of each value into account (Rubin, 1987). It is based on the assumption that the data are missing at random (MAR). Missing data analysis revealed that 99.05% of values were complete at baseline. Of the initial 439 participants at T1, 70.84% of participants completed T2, 44.43% completed T3, and 25.06% completed T4. We imputed 100 data sets in SPSS version 23 and these were then exported to Mplus 7.3 (Muthén & Muthén, 2014). The results were pooled based on Rubin's rules (Rubin, 1987). The imputation model utilized variables associated with HTQ scores at T2, T3, and T4 to increase the plausibility of the MAR assumption.

Variables used included T1 HTQ scores, education, age, and social support. Finally, due to the small amount of missing data on all predictor variables (0.2% missing cases), we imputed values using the expectation maximization algorithm in SPSS version 22. Little's (1988) missing completely at random (MCAR) test suggested that the missing baseline values were missing completely at random ($\chi^2 = 7424.65$, $df = 7322$, $p = .198$).

Analytic Plan

The analysis was conducted using Mplus 7.2 (Muthén & Muthén, 2014). We conducted latent class growth analysis (LCGA; Muthén, 2001; Nagin, 1999). LCGA is a type of finite mixture modeling, which divides a heterogeneous sample into a number of latent subgroups based on different growth trajectories. The variance of latent slope and intercept are fixed to zero within classes and are allowed to vary only between classes. As there is no covariance between the slope and intercept, and there are less parameters to estimate, it is easier for the model to converge (Nagin, 1999; Roeder, Lynch, & Nagin, 1999). This method has been used by other studies which have examined trajectories of PTSD treatment response (e.g., Currier et al., 2014). We tested class solutions comprising between one to six classes. Optimal model fit was determined using a variety of fit indices: the Bayesian information criterion (BIC; Schwarz, 1978), the Akaike information criterion (AIC; Akaike, 1987), and the sample-size-adjusted Bayesian information criterion (adjusted BIC; Sclove, 1987). As multiple imputation was used, the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT) and the bootstrapped likelihood ratio test (BLRT) were not available. It has been argued that the optimal group solution is characterized by the lowest BIC, adjusted BIC, and AIC and a high classification accuracy (the entropy value should be close to 1). There is evidence to suggest that the BIC performs best when deciding on the number of groups (Nylund, Asparoutiov, & Muthén, 2007). We tested the model with both linear and quadratic terms. The robust maximum likelihood estimator was used. Maximum likelihood estimators are suitable for data that do not meet the assumption of normality (Satorra & Bentler, 1994; Yuan & Bentler, 2000) and have been found to be asymptotically efficient and consistent in large samples (Bollen, 1989).

A multinomial logistic regression was then performed to examine predictors of class membership using the three-step approach (R3STEP function; Asparouhov & Muthén, 2014; Vermunt, 2010). We included age, sex, education, coping styles, PTSD symptom clusters, and social support in the analysis. A multinomial logistic regression and a latent class analysis can be combined in one step; however, the resulting classes will be based on the

Table 1. Fit Indices for Each LCGA Model.

No. of classes	Entropy	BIC	Adjusted BIC	AIC
1	—	3,238.507	3,216.292	3,209.916
2	0.815	2,637.802	2,602.893	2,592.872
3	0.823	2,459.844	2,412.241	2,398.576
4	0.777	2,435.271	2,374.974	2,357.665
5	0.763	2,435.355	2,362.365	2,341.412
6	0.744	2,435.507	2,349.822	2,325.225

Note. Cutoff score for probable PTSD diagnosis is >40. LCGA = latent class growth analysis; BIC = Bayesian information criterion; AIC = Akaike information criterion.

predictors as opposed to only the latent class indicators. This can lead to the classes losing their meaning (Asparouhov & Muthén, 2014). The current approach, however, estimates the latent class model using only the required indicators. Following this first step, a variable *S* (most likely class membership) is created; this is based on the latent class posterior distribution (obtained during step one), and the classification uncertainty rate is also taken into account. In the final step, the most likely class variable (which includes measurement error) is used as the dependant variable in a regression analysis (Asparouhov & Muthén, 2014; Vermunt, 2010).

Results

Examination of the mean scores revealed a reduction in PTSD symptoms over time. At T1, the mean PTSD score was 45.53 ($SD = 8.07$), at T2 the mean score was 40.53 ($SD = 9.46$), at T3 the mean score was 37.12 ($SD = 10.84$), and at T4 the mean score was 34.77 ($SD = 10.54$). We used LCGA to examine PTSD trajectories. The model fit improved with the addition of the quadratic term. Fit indices for each model (with the quadratic term) are displayed in Table 1. Each time a class was added, the results revealed an improvement in fit. When the fifth class was added, the reductions in the fit indices were small suggesting that the addition of this class did not greatly improve the model. The BIC leveled off (there was an increase of 0.08) and although the adjusted BIC and the AIC decreased, the reductions (12.61 and 16.25, respectively) were small. Therefore, based on the fit indices, theory, and parsimony the four-class solution was chosen as optimal for the data.

The trajectories are presented in Figure 1. The first trajectory (15.03%; high PTSD treatment resistant) was characterized by high clinical levels of PTSD at T1 which did not significantly change over time; the quadratic term was not

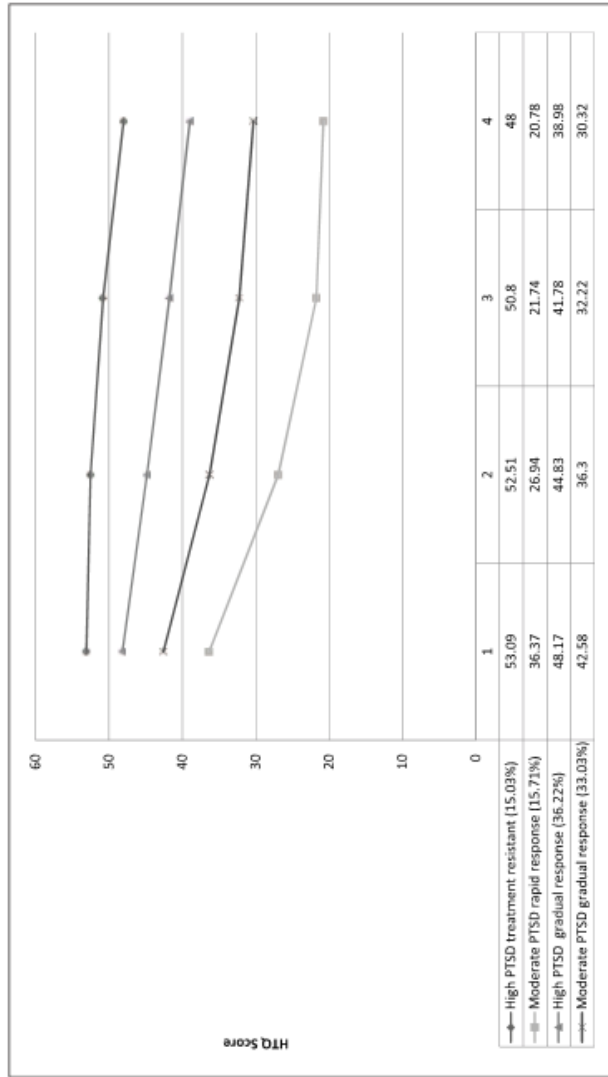


Figure 1. PTSD treatment response trajectories.
 Note. PTSD = posttraumatic stress disorder; HTQ = Harvard Trauma Questionnaire.

significant for this class (Intercept = 3.32, $SE = 0.1$, $p < .00$; Slope = -0.00 , $SE = 0.1$, $p > .05$; Quadratic = -0.04 , $SE = 0.03$, $p > .05$). This class experienced the least changes in symptoms over time (decrease of 5.09). Clinical levels of PTSD remained even after 18 months of treatment. The second trajectory (15.71%; moderate PTSD rapid response) was characterized by moderate sub-clinical levels of PTSD at T1 which significantly improved over time; the quadratic term was also significant (Intercept = 2.27, $SE = 0.18$, $p < .00$; Slope = -0.72 , $SE = 0.13$, $p < .00$; Quadratic = 0.13, $SE = 0.04$, $p < .00$). The largest improvement occurred between T1 and T2 (decrease of 9.43), and after T2 the symptoms continued to improve but at a more gradual pace. This group experienced the largest improvements in PTSD symptoms (15.59). The third pattern (36.22%; high PTSD gradual response) was characterized by high clinical levels of PTSD at T1 which significantly improved over time. At T4, the mean PTSD score was below the clinical cutoff score. The quadratic term was not significant (Intercept = 3.01, $SE = 0.15$, $p < .00$; Slope = -0.22 , $SE = 0.12$, $p = .05$; Quadratic = 0.01, $SE = 0.03$, $p > .05$). The symptoms decreased in a linear fashion, and there was an overall decrease of 9.21 units. Trajectory four (33.03%; moderate PTSD gradual response) was characterized by moderate but clinical levels of PTSD at T1 which significantly improved over time; the quadratic term was significant (Intercept = 2.66, $SE = 0.10$, $p < .001$; Slope = -0.46 , $SE = 0.13$, $p < .001$; Quadratic = 0.07, $SE = 0.03$, $p < .05$). In this group, the HTQ score decreased by 12.26 units.

The demographic characteristics of the full sample and each class can be found in Table 2. The odds ratios (ORs) and 95% confidence intervals (CIs) for all predictors are presented in Table 3. A multinomial logistic regression was conducted to examine predictors of class membership. All classes were compared with each other. Higher social support at T1 (OR = 0.81, 95% CI: [0.74, 0.88]) and a longer time period since the abuse (OR = 0.93, 95% CI: [0.87, 0.98]) predicted a decrease in odds of being in the treatment resistant class when compared with the moderate PTSD gradual response class, whereas increased levels of reexperiencing symptoms (OR = 1.85, 95% CI: [1.36, 2.49]), avoidance symptoms (OR = 1.49, 95% CI: [1.2, 1.84]), arousal symptoms (OR = 1.38, 95% CI: [1.01, 1.87]), and emotion-focused coping (OR = 1.22, 95% CI: [1.02, 1.46]) were associated with increased odds of being in the treatment resistant class. When the moderate PTSD rapid response class was compared with the moderate PTSD gradual response class, increased social support at T1 (OR = 1.1, 95% CI: [1.01, 1.21]) and older age (OR = 1.63, 95% CI: [1.09, 2.42]) predicted an increase in odds of being in the rapid response class. A longer length of time since the abuse occurred was associated with a decrease in odds of membership in the rapid response class (OR = 0.93, 95% CI: 0.89-0.97). The odds of being in the high

Table 2. Demographics and Descriptive Statistics for the Full Sample and for Each Trajectory.

Variable	Full Sample	Class 1	Class 2	Class 3	Class 4
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Female N (%)	376 (85.8)	65 (95.6)	66 (93)	110 (19.7)	135 (83.3)
Other trauma N (%)	372 (84.7)	60 (90.9)	50 (72.4)	143 (89.9)	119 (82.1)
Education	13.44 (3.51)	12.43 (3.59)	14.01 (3.27)	12.99 (3.49)	14.01 (3.48)
Age	36.46 (10.83)	38.59 (11.52)	33.37 (8.87)	37 (11.67)	36.46 (10.37)
Social support ^a	11.97 (6.21)	9.56 (3.13)	12.67 (7.71)	11.38 (5)	13.3 (7.11)
Social support ^b	30.13 (7.45)	24.76 (6.42)	35.01 (6.87)	28.45 (7.11)	31.74 (6.52)
Coping rational	24.21 (4.94)	23.43 (4.91)	25.33 (5.04)	23.41 (5)	24.72 (4.73)
Emotional	24.80 (5.82)	28.65 (4.89)	20.46 (4.76)	26.89 (5.39)	23.51 (5.3)
Detached	10.91 (2.82)	10.35 (2.57)	10.64 (2.72)	10.59 (2.72)	11.54 (2.95)
Avoidant	21.68 (4.24)	22.26 (4.34)	19.95 (4.13)	22.42 (4.17)	21.57 (4.12)
Reexperiencing	10.44 (2.84)	12.98 (2.22)	8.56 (2.59)	10.97 (2.51)	9.73 (2.56)
Avoidance	19.51 (4.09)	22.79 (2.47)	15.35 (3.92)	12.19 (3.36)	18.53 (3.34)
Hyperarousal	15.47 (2.94)	17.68 (1.6)	13.12 (3.5)	21.19 (2.24)	14.86 (2.72)
Time since abuse	22.2 (11.69)	20.61 (13.21)	21.28 (9.5)	22.11 (11.78)	25.29 (1.48)

Note. Class 1 = high PTSD treatment resistant, Class 2 = moderate PTSD rapid response, Class 3 = high PTSD gradual response, Class 4 = moderate PTSD gradual response.

^aDuring trauma.

^bAt baseline.

PTSD gradual response compared with moderate PTSD gradual response were decreased by being female (OR = 0.33, 95% CI: [0.12, 0.87]), having higher social support (OR = 0.91, 95% CI: [0.85, 0.97]) and a longer period of time since the abuse occurred (OR = 0.95, 95% CI: [0.9, 0.99]). The odds of being in the high class were increased with higher levels of reexperiencing (OR = 1.34, 95% CI: [1.1, 1.63]) and avoidance symptoms at T1 (OR = 1.22, 95% CI: [1.01, 1.45]).

Odds of being in the high PTSD treatment resistant class were increased with higher levels of reexperiencing (OR = 1.37, 95% CI: [1.03, 1.81]) and avoidance symptoms (OR = 1.23, 95% CI: [1.03, 1.45]) and decreased with higher levels of social support (OR = 0.89, 95% CI: [0.82, 0.96]) when compared with the high PTSD moderate response class. When the moderate PTSD rapid response class was compared with the high PTSD gradual response class, odds of being in the moderate class increased with higher levels of social support (OR = 1.21, 95% CI: [1.09, 1.34]) and decreased with higher reexperiencing (OR = 0.64, 95% CI: [0.49, 0.83]), avoidance symptoms (OR = 0.72, 95% CI: [0.57, 0.91]), and higher levels of emotional coping (OR = 0.82, 95% CI: [0.72, 0.94]). Finally, odds of being in the treatment resistant class decreased with higher levels of social support (OR = 0.73, 95% CI: [0.65, 0.83]) and increased with higher reexperiencing

Table 3. ORs and 95% CIs for Predictors of Trajectory (Class) Membership.

Predictor	1 vs. 4		2 vs. 4		3 vs. 4		1 vs. 3		2 vs. 3		1 vs. 2	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Age	1.32	[0.78, 2.26]	1.63	[1.09, 2.42]*	1.23	[0.91, 1.66]	1.07	[0.63, 1.81]	1.31	[0.86, 2.02]	0.81	[0.43, 1.51]
Female	0.51	[0.07, 3.59]	0.99	[0.18, 5.29]	0.33	[0.12, 0.87]*	1.55	[0.21, 11.02]	3.02	[0.37, 15.77]	0.51	[0.04, 5.76]
Education	0.93	[0.8, 1.08]	0.89	[0.75, 1.06]	0.94	[0.58, 1.05]	0.99	[0.85, 1.14]	0.94	[0.78, 1.36]	1.05	[0.83, 1.3]
Time since trauma	0.93	[0.87, 0.98]**	0.93	[0.89, 0.97]**	0.95	[0.9, 0.99]**	0.98	[0.9, 1.03]	0.99	[0.9, 1.04]	0.99	[0.93, 1.06]
Social support ^a	0.9	[0.72, 1.11]	0.95	[0.87, 1.04]	0.97	[0.91, 1.03]	0.93	[0.74, 1.16]	0.98	[0.89, 1.08]	0.95	[0.75, 1.18]
Social support ^b	0.81	[0.74, 0.88]**	1.1	[1.01, 1.21]*	0.91	[0.85, 0.97]**	0.89	[0.82, 0.96]**	1.21	[1.09, 1.34]**	0.73	[0.65, 0.83]**
Reexperiencing	1.85	[1.36, 2.49]**	0.86	[0.68, 1.07]	1.34	[1.11, 1.63]**	1.37	[1.03, 1.81]**	0.64	[0.49, 0.83]**	2.15	[1.5, 3.1]**
Hyperarousal	1.38	[1.01, 1.87]**	0.97	[0.83, 1.13]	1.13	[0.96, 1.33]	1.22	[0.9, 1.64]**	0.86	[0.71, 1.05]	1.42	[1.02, 1.96]**
Avoidance	1.49	[1.2, 1.84]**	0.87	[0.71, 1.06]	1.22	[1.01, 1.45]**	1.23	[1.03, 1.45]**	0.72	[0.57, 0.91]**	1.71	[1.31, 2.24]**
Rational coping	0.96	[0.81, 1.12]	0.97	[0.87, 1.08]	1.05	[0.95, 1.15]	0.91	[0.77, 1.07]	0.93	[0.81, 1.06]	0.98	[0.81, 1.18]
Emotional coping	1.22	[1.02, 1.46]**	0.89	[0.79, 1.01]	1.09	[0.98, 1.19]	1.13	[0.94, 1.34]	0.82	[0.72, 0.94]**	1.37	[1.11, 1.68]**
Detached coping	1.28	(0.89-1.8)	0.84	[0.67, 1.04]	1	[0.93, 1.2]	1.28	[0.88, 1.85]	0.84	[0.65, 1.08]	1.52	[1.02, 2.27]**
Avoidant coping	0.83	[0.67, 1]	0.98	[0.83, 1.14]	0.95	[0.85, 1.05]	0.87	[0.71, 1.05]	1.03	[0.88, 1.21]	0.84	[0.66, 1.06]
Other trauma	0.63	[0.135, 2.9]	0.63	[0.24, 1.64]	1.43	[0.32, 6.35]	0.44	[0.12, 1.58]	0.44	[0.09, 2.07]	0.98	[0.19, 5.1]

Note. Class 1 = high PTSD treatment resistant, Class 2 = moderate PTSD rapid response, Class 3 = high PTSD gradual response, Class 4 = moderate PTSD gradual response. OR = odds ratio; CI = confidence interval.

^aDuring trauma.

^bAt T1.

*p < .05. **p < .01. ***p < .001.

(OR = 2.15, 95% CI: [1.5, 3.1]), avoidance (OR = 1.71, 95% CI: [1.31, 2.24]), and hyperarousal symptoms (OR = 1.42, 95% CI: [1.02, 1.96]) and higher levels of emotion-focused (OR = 1.37, 95% CI: [1.11, 1.68]) and detached coping (OR = 1.52, 95% CI: [1.02, 2.27]) when compared with the moderate PTSD rapid responding group.

Discussion

Consistent with the extant literature, the results revealed that overall PTSD scores decreased over the course of treatment (Taylor & Harvey, 2010). At the first assessment, the mean PTSD score was over the cutoff score for a probable PTSD diagnosis ($M = 45.53$, $SD = 8.07$), and by T3, this had reduced to below the clinical cutoff score ($M = 37.12$, $SD = 10.84$). The first aim of this study was to examine whether multiple PTSD trajectories were present. The initial examination of the mean HTQ scores did not reflect the four distinct subgroups within this population which were identified by applying LCGA. Two classes characterized by moderate PTSD at baseline were identified. The moderate PTSD gradual response class (33.03%) entailed a moderate PTSD responding group in which symptoms improved steadily over a period of 18 months. The moderate PTSD rapid response class (15.71%) was characterized by a rapid improvement in symptoms within the first 6 months of treatment; this improvement continued but was more gradual over the remaining treatment period. The identification of this trajectory was in line with a study by Elliot et al. (2005) examining PTSD trajectories in veterans attending treatment. This suggests that the moderate PTSD rapid response trajectory is not exclusive to CSA trauma populations. It may be that this subgroup does not require long-term treatment as the majority of the improvement occurs within the earlier stages of the treatment. The identification of two groups with moderate PTSD that respond differently has not been found in previous studies. This finding suggests that individuals with moderate PTSD at T1 are likely to have a significant improvement in symptoms; however, they may improve at differing rates. Two groups with relatively high PTSD scores at baseline were also identified. The high PTSD gradual response group (36.22%) was characterized by clinical PTSD symptoms which decreased gradually to a nonclinical level over a period of 18 months. This finding was similar to a class found in a sample of female victims of interpersonal violence, characterized by high PTSD at baseline, which were below the clinical cutoff at the end of treatment (Stein et al., 2012). Although these results have suggested that CSA survivors with high PTSD at baseline can benefit from treatment, there was another class which showed no significant improvement in symptoms over time. The high PTSD treatment resistant

class (15.03%) did not appear to benefit from the treatment, and after 18 months, the mean HTQ score was still above the clinical cutoff point. Treatment resistant trajectories have also been found among veterans attending inpatient PTSD treatment centers (Currier et al., 2014) and female victims of interpersonal violence (Stein et al., 2012).

The second aim of the current study was to identify predictors of PTSD treatment response trajectories. The extant literature has demonstrated that emotion-focused coping is a risk factor for the development and maintenance of PTSD (Karstoft et al., 2015). Consistent with this, our findings revealed that higher levels of emotional coping predicted membership in the treatment resistant class when compared with both moderate PTSD response classes and the high PTSD gradual responder when compared with the moderate PTSD rapid response class. This suggests that emotional coping is associated with more severe pretreatment PTSD which may not respond to treatment. This finding highlights the long-term maladaptive nature of emotion-focused coping. It has been suggested that emotional coping can be adaptive in the short term (Briere, 2002). For example, during a traumatic event (such as CSA), problem-focused coping (e.g., resistance) may lead to increased aggression from the perpetrator, whereas emotional coping would reduce the immediate distress for the victim (Spaccarelli, 1994). However, if this coping style is maintained, it can have harmful long-term effects. It is thought that it can interfere with the processing of the trauma memories and subsequently maintain PTSD (Briere, 2002; Ehlers & Clark, 2000). Interestingly, the results also revealed that detached coping was associated with membership in the treatment resistant class when compared with the moderate rapid response class. This suggests that feelings of being independent from the trauma can also have a long-term negative impact. It is possible that feeling detached from the traumatic event prevents the processing of the traumatic memories in a similar way to emotion-focused coping (Ehlers & Clark, 2000). This finding however is contrary to the view that detached coping is an adaptive response to stress (Roger et al., 1993). Notably, rational and avoidant coping were not associated with PTSD recovery. It is possible that the inconsistencies in the findings are due to the measurements used. Although these results require further investigation, they have some important clinical implications. First, individuals with high levels of emotional and detached coping styles should be considered as having an increased risk of severe PTSD which does not respond to psychotherapy. Second, it is possible that reducing emotion-focused and detached coping and teaching a more adaptive coping style would allow effective processing of the trauma memories and potentially reduce PTSD symptoms, thus improving outcomes for CSA survivors.

The results in the present study concurred with previous literature which has consistently evidenced the protective nature of social support in relation to PTSD (Brewin et al., 2000; Ozer et al., 2003; Steine et al., 2017). Social support (at T1) was associated with reduced odds of being in the high PTSD treatment resistant class when compared with both moderate PTSD classes. Furthermore, when both high PTSD classes were compared, social support was associated with treatment response, and when both moderate classes were compared, it was associated with a more rapid response. These results suggest that current social support is associated with less severe PTSD. Furthermore, individuals with severe PTSD and greater social support are more likely to respond to treatment, and individuals with moderate PTSD and those with greater social support are more likely to respond to treatment at a faster rate. Our findings lend support to the stress buffering theory which posits that social support improves stress regulation by influencing subjective appraisal and both internal and external stress responses (Cohen & Wills, 1985). In line with this theory, social support has been found to increase healthy behaviors and decrease risky behaviors (Holahan, Moos, Holahan, & Brennan, 1995). Moreover, it has been found to be associated with higher self-worth, and a sense of purpose, which has been thought to increase motivation for more positive self-care (Southwick & Charney, 2012). It is also possible the association between PTSD severity and low social support in the current study is due to the negative impact that PTSD symptomology can have on relationships (Campbell & Renshaw, 2013). Further studies are required to increase understanding of the mechanisms underlying this association. If social support influences PTSD severity and course, it is possible that targeting social skills during treatment could also improve outcomes for CSA survivors. In line with this, previous research has demonstrated the effectiveness of social skills interventions. For example, a review of over 100 studies examining the outcomes of interventions focusing on social and behavioral skills found that 83% of the studies evidenced positive effects such as decreased psychological distress (Hogan, Linden, & Najarian, 2002).

Previous research examining the role of symptoms clusters in overall PTSD severity has shown conflicting results. Some studies have highlighted the importance of hyperarousal symptoms (Stein et al., 2012) and others have evidenced the importance of avoidance (Hyland et al., 2016) or reexperiencing symptoms (Creamer et al., 1992). When examining the role of symptoms clusters, our results revealed that higher levels of reexperiencing, avoidance, and hyperarousal predicted membership in the treatment resistant class when compared with the moderate PTSD treatment response class. It is possible that individuals with higher levels of overall PTSD are less likely to improve over the course of treatment. Of note, no individual

symptoms were predictive of class membership when both moderate classes were compared, suggesting that no individual symptom should take priority among individuals with moderate levels of PTSD. Interestingly, when both high classes were compared, treatment resistance was predicted by more severe reexperiencing and avoidance. This finding suggests that these symptoms may be a priority among individuals with higher levels of PTSD. Emotional processing theories suggest that avoidance is an attempt to reduce distressing symptoms, and it has been argued that this prevents effective processing of traumatic memory and therefore maintains PTSD (Foa, Steketee, & Rothbaum, 1989). Our findings are also consistent with Kleim, Ehlers, and Glucksman's (2007) study which found that reexperiencing symptoms were an early predictor of later PTSD severity. Moreover, there is evidence suggesting that specifically targeting flashbacks in treatment lead to higher rates of PTSD improvement (Nijdam, Baas, Olf, & Gersons, 2013). Reexperiencing and arousal symptoms reinforce the learning that occurred during the traumatic event which can maintain PTSD (Shalev, 2002). It is possible that the individuals in the treatment resistant trajectory have PTSD which is maintained by the presence of high reexperiencing symptoms which continue to reinforce the learning that occurred during the trauma. However, due to the presence of avoidance symptoms, individuals are not able to effectively process these traumatic memories. Clinicians should be aware of these findings, and reexperiencing and avoidance symptoms should be specifically targeted among individuals with severe PTSD. This may potentially improve overall PTSD outcomes. Further research on the role of symptoms clusters should be conducted as this could have important theoretical and clinical implications for trauma survivors with PTSD.

In relation to abuse characteristics, the study found that experiencing another trauma in addition to CSA was not predictive of trajectory membership; this is contrary to other studies which have suggested that childhood cumulative trauma predicts more severe PTSD among CSA survivors (Steine et al., 2017). In the current study, the traumas included were not confined to childhood. It is possible that the results may have been different if childhood and adulthood traumas had been examined separately. Increased length of time since the abuse occurred was associated with membership in the moderate PTSD gradual response class when compared with all other classes. This contrasts with the results of another recent study which found that the time since the trauma occurred was not predictive of treatment outcomes (Murray, El-Leithy, & Billings, 2017). Given these inconsistencies, further research is warranted. Finally, being female was associated with membership in the moderate PTSD gradual responding class when compared with the high

PTSD gradual responding class, and older age was associated with membership in the moderate PTSD rapid response class when compared with the moderate PTSD gradual responding class. These findings suggest that older age and being female may be associated with less severe PTSD and better treatment outcomes.

Overall, this study revealed four distinct trajectories, suggesting that not all CSA survivors respond to treatment in the same way. It has also highlighted that the examination of changes in group means is not sufficient for evaluating the effectiveness of treatment. The majority of participants in this sample did respond positively to treatment; however, 15.03% did not experience an improvement in PTSD symptoms. In addition, we have identified protective and risk factors associated with PTSD treatment response. Emotional and detached coping, reexperiencing and avoidance symptoms, and low social support have been found to increase risk of treatment resistance, and social support has been found to be associated with less severe symptoms which are more likely to improve over the course of treatment. These findings have important clinical implications. These factors could potentially identify participants who are at risk of not responding to treatment. Furthermore, the factors could be specifically addressed to increase positive outcomes for all participants.

The findings of the current study should be interpreted in the light of several limitations. First, in this study there was no control group used. Therefore, we cannot conclude that the changes in symptoms were a result of the psychotherapy and it could be suggested that the changes in symptoms were due to the passage of time. Although some of the participants had recent experiences of sexual abuse, the majority of the CSA experiences were historical (the mean length of time since the abuse was 22.2 years, with a range of 1-61 years). It is therefore reasonable to suggest that many of the participants may have had chronic PTSD prior to attending treatment and that at least some of the changes in symptomology were due to the treatment and not only due to the natural progression of PTSD over time. Future studies examining PTSD trajectories comparing multiple types of therapy or using a waitlist control group will be important to examine the specificity of the findings in the current study. Second, there have been recent changes to PTSD's diagnostic criteria (*DSM-5*; APA, 2013). Future studies should utilize data reflecting these changes to determine if the results remain consistent. Second, attrition rates were high within this sample. Attrition is a common problem within longitudinal studies (Spratt et al., 2010), and it has been argued that biases associated with case wise deletion can be reduced by using methods such as multiple imputation for managing the missing data (Sterne et al., 2009). Finally, a number of individuals (including those presenting under the influence of

drugs and alcohol or with current psychosis) were excluded from the treatment and referred for more appropriate treatment. This may have impacted the results and is likely to reduce the generalizability of the findings. Despite these limitations, this study was based on a relatively large treatment-seeking sample and the findings add to the literature by identifying differential treatment response in adult survivors of CSA. Furthermore, to the best of our knowledge, this was the first to examine the role of social support, coping style, and PTSD symptom clusters as predictors of heterogeneous trajectories of PTSD treatment response within the current sample.

Declaration of Conflicting Interests

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