

Grete Dyb

Posttraumatic stress reactions in children and adolescents

Doctoral thesis
for the degree of Doctor Medicinae

Trondheim, October 2005

Norwegian University of Science and Technology
Faculty of Medicine
Department of Child and Adolescent Psychiatry

NTNU

Norwegian University of Science and Technology
Doctoral thesis
for the degree Doctor Medicinae
Faculty of Medicine
Department of Child and Adolescent Psychiatry

© Grete Dyb

ISBN 82-471-7309-3 (printed vers.)
ISBN 82-471-7308-5 (electronic vers.)
ISSN 1503-8181

Doctoral theses at NTNU, 2005:206

Printed by NTNU-trykk

Table of contents

List of papers	4
Acknowledgements	5
Abbreviations	6
Summary	7
1. Introduction	10
1.1 Post-traumatic stress in children and adolescents – background and development	10
1.1.1 The empirical stage	10
1.1.2 The alarm period	11
1.1.3 Period of syntheses	12
1.1.4 Beginning research	12
1.2 Current criteria of posttraumatic stress disorder (PTSD) in children and adolescents	13
1.2.1 Traumatic stressor (criteria A)	14
1.2.2 Reexperiencing (criterion B)	16
1.2.3 Avoidance and numbing (criterion C)	16
1.2.4 Hyperarousal (criterion D)	18
1.2.5 Duration of symptoms (criterion E) and level of impairment (criterion F)	18
1.2.6 DSM-IV and ICD-10	18
1.3 Challenges in research on PTSD in children and adolescents	19
1.3.1 Traumatic stressors and peritraumatic reactions	19
1.3.2 PTSD reactions in children and adolescents	22
1.3.3 Co-existing factors and PTSD reactions	25
1.3.3.1 Pre-trauma factors	25
1.3.3.2 Post-trauma factors	27
1.3.4 Family perspectives of child trauma	28
1.3.5 Validity of symptom criteria B,C and D of PTSD (DSM-IV)	28
1.4 Aims of the study	31
2. Material and methods	32
2.1 Participants	32
2.1.1 Sample 1	32
2.1.2 Sample 2	33
2.1.3 Sample 3	34

2.2	Instruments	34
2.2.1	Interviews	36
2.2.1.1	Parent Interview (CSA)	36
2.2.1.2	Adolescent interview	38
2.2.1.3	Parent Interview (TA)	40
2.2.1.4	Child Interview (CPTS-RI)	40
2.2.2	Questionnaires	41
2.2.2.1	Community violence exposure survey (CVES)	41
2.2.2.2	Child Behavior Check List (CBCL)	42
2.2.2.3	Impact of Event Scale (IES)	42
2.2.2.4	Child Posttraumatic Stress Reaction Index (CPTS-RI)	43
2.2.2.5	General Health Questionnaire (GHQ)	43
2.2.2.6	Locus of Control of Behavior (LCB)	44
2.2.3	Assessment scale: Children's Global Assessment Scale (CGAS)	44
3.	Summary of papers	46
3.1	Paper I: Posttraumatic stress reactions and behavior problems in children four years after alleged sexual abuse in daycare	46
3.2	Paper II: Alleged sexual abuse at a day care center: impact on parents.	47
3.3	Paper III: Subjective features of traumatic experiences and PTSD in adolescents.	48
3.4	Paper IV: Parent-child discrepancy in reporting children's post- traumatic stress reactions after a traffic accident	49
4.	General discussion	50
4.1	PTSD reactions in children and adolescents	50
4.2	The family perspective of child trauma	53
4.3	Validity of PTSD assessments in children	55
4.4	Limitations of the study	56
4.5	Conclusions	57
4.6	Suggestions for future research	58
5	References	60
	Appendix 1: Definitions of child sexual abuse	73
	Errata	77

List of papers

- I. Dyb, G. & Holen, A.
Posttraumatic stress reactions and behavior problems in children four years after alleged sexual abuse in daycare. Submitted.

- II. Dyb, G., Holen, A., Steinberg, A. M., Rodriguez, N. & Pynoos, R. S. (2003).
Alleged sexual abuse at a day care center: impact on parents.
Child Abuse and Neglect, 27, 939-950.

- III. Dyb, G., Rodriguez, N., Brymer, M., Saltzman, W., Steinberg, A. M. & Pynoos, R. S.
Subjective Features of Traumatic Experiences and PTSD in Adolescents.
Submitted.

- IV. Dyb, G., Holen, A., Braenne, K., Indredavik, M. S. & Aarseth, J. (2003).
Parent-child discrepancy in reporting children's post-traumatic stress reactions after a traffic accident. *Nordic Journal of Psychiatry*, 57, 339-344.

Acknowledgements

This study was carried out at the Department of Child and Adolescent Psychiatry, Faculty of Medicine, Norwegian University of Science and Technology (NTNU) in Trondheim, Norway.

I would like to thank all those who have supported me in this work, and in particular I would like to thank:

- Are Holen, M.D., Ph.D., Chairman of the Department of Neuroscience, NTNU, my supervisor, for invaluable help, friendly support and continuous encouragement throughout the whole project.
- Marit S. Indredavik, M.D., co-author, for initiating the project and sharing valuable advice and guidance me in my work.
- Kjersti Brønne, M.D. and Jon Aarseth, Psy.D., both co-authors, and other colleagues at BUP-klinikk in Trondheim for encouragements and valuable discussions.
- Department of Child and Adolescent Psychiatry (RBUP), Faculty of Medicine, NTNU, for giving me the opportunity to carry out the study.
- My colleagues at The National Center for Child Traumatic Stress, at UCLA, University of California; Robert S. Pynoos M.D., Alan M. Steinberg Ph.D., Ned Rodriguez Ph.D., Melissa Brymer Psy.D. and Bill Salzman Ph.D., for the great opportunity to carry out research on PTSD in adolescents, and for their contributions as co-authors.
- The US-Norway Fulbright Foundation for Educational Exchange and the Unger Vetlesen Medical Fund for giving me the opportunity to work with fellow high level researchers in the field of child traumatic stress at UCLA in California, US.
- My colleagues at the Norwegian Center for Studies on Violence and Traumatic Stress in Oslo for encouragement and support in the last phases of the work.
- My children Henrik, Karina and Kristian, my parents and siblings and their families for continuous support.
- Finally, very special thanks to my husband, John-Anker, who has been standing firmly by my side and inspired me in the process. His valuable advises and support has spurred me to pursue doing scientific work.

Oslo, April 14, 2005
Grete Dyb

Abbreviations

CBCL	Child behavior check list
CGAS	Children's global assessment scale
CPTS-RI	Child posttraumatic stress reaction index
CSA	Child sexual abuse
CVES	Community violence exposure survey
DSM	Diagnostic and statistical manual of mental disorders
ICD	International classification of diseases
GAF	Global assessment of functioning
GHQ	General health questionnaire
IES	Impact of event scale
INT	Intervention thoughts
LCB	Locus of control of behavior
PA	Physiological arousal
PD	Peritraumatic dissociation
PTSD	Posttraumatic stress disorder
PTSD-RI	Posttraumatic stress disorder reaction index
TA	Traffic accident
PA	Physiological arousal
PD	Peritraumatic dissociation

Summary

The 1980s mark the beginning of systematic research and theoretical advances in the field of psychic trauma in children. Posttraumatic stress disorder (PTSD) was a diagnosis for adults in the Diagnostic and Statistical Manual of Mental Disorders, DSM-III (American Psychiatric Association, 1980). In a later version, children and adolescents were partially included (American Psychiatric Association, 1987). Since 1980, a range of traumatic events have been identified as having the required stressor characteristics for posttraumatic stress reactions to manifest in children and adolescents.

In this study, the role of the stressor and peritraumatic reactions in PTSD of children and adolescents was studied. In addition, co-existing factors were assessed and related to the development and maintenance of PTSD reactions. A cascade of distressing events described the stressor in children who reported sexual abuse in daycare (paper I), and single-incident events were studied in adolescents (paper III). Subjective reactions during or immediately after the traumatic event, such as intense emotions, physiological arousal, dissociation and having thoughts of intervening, were strongly associated to the subsequent development of PTSD reactions in adolescents. The findings indicate that subjective responses to traumatic events play an important role in PTSD etiology. Objective features of the stressor, such as death or physical injury did not relate significantly to the levels of posttraumatic stress reactions. Half the children exposed to the cascade stressor in the case of alleged child sexual abuse, showed significant levels of PTSD reactions four years later. The objective features of the cascade stressor depended on the reported severity of child sexual abuse as well as media exposure, medical examinations, forensic interviews and the

court trial. Children with high levels of PTSD reactions reported more severe CSA and were also more exposed to the media and the court trial, but the tendency was not significant.

Moreover, co-existing factors not related to the traumatic event may play important roles in the development and maintenance of PTSD reactions. After alleged sexual abuse and subsequent distressing events, older children displayed more PTSD reactions than younger children, which may indicate that younger children were more protected from developing distress in this situation. On the other hand, five weeks after a tram car accident, age was negatively associated with the levels of PTSD reactions in a group of children (paper IV). The findings may be due to the diverse nature of the stressors and methodological issues.

Other co-existing factors to PTSD, such as behavior problems in children and adolescents, may represent considerable difficulties in a young person's life. In the current study, children displayed significant levels of behavioral problems four years after alleged sexual abuse.

The impact on parents and the rest of the child's family cannot be ignored in the assessment of posttraumatic stress reactions of children and adolescents. In this study, comprehensive assessments were made of the parents' experiences and levels of distress after alleged sexual abuse of their children. The parents were exposed to a cascade of events, including hearing about the sexual abuse, being involved in the police investigation and the court trial and being exposed in media reports. Four years after the events, elements of the stressor were significantly associated to the level of posttraumatic stress

reactions. The findings illustrate how child sexual abuse reports may involve the children's parents and expose them to high levels of distress over a long period of time.

In addition, interactions in the family may contribute in the development and maintenance of posttraumatic stress reactions in children and adolescents, and impede the healing processes.

After traumatic events in childhood, researchers tend to prefer parental reports of the children's reactions to spare the children. In this study, children reported significantly higher levels of distress than observed by their parents after a tram car accident (paper IV). These findings indicate that parents unintentionally may bring in a response bias in their reports, which future research and clinical practice should take into account.

The study illustrates that traumatic events are complex experiences involving cognitive and emotional reactions, physiological arousal and dissociation, and that these reactions may induce posttraumatic stress reactions in children and adolescents. The cascade stressor subsequent to alleged sexual abuse of children showed how different elements of the stressor may lead to distress over a long period of time. The distress involved both children and parents in this study.

1. Introduction

1.1 Post-traumatic stress in children and adolescents – background and development

When Leonore Terr published her data on short- and long-term responses in children to major psychic trauma (1981, 1983), she was greeted with disbelief by the psychiatric community (Benedek, 1985). The disbelief might have been so intense because professionals found it hard to accept that traumatic events might color and shape the lives of children for years to come. However, ample evidence for victimization of children has been provided by history, and reminds us that children never have been strangers to traumatic stress and sequelae.

Langmeier and Matejcek (1973) described four stages in the growing understanding of the nature and consequences of trauma, psychic stress, and psychological sequelae in children: 1) The empirical stage, 2) The alarm stage, 3) The period of syntheses and 4) The beginning of systematic research.

Leonore Terr's study in the 1980s (Terr, 1981, 1983), marks the beginning of research and theoretical advances in the field: understanding trauma in children and adolescents. The four stages outlined by Langmeier and Matejcek (1973) will briefly be reviewed.

1.1.1 *The empirical stage*

At the end of the 19th century and first three decades of the 20th century, pediatric observations of children living in institutions such as orphanages and

hospitals revealed high death rates, as well as developmental and intellectual retardation. Often, the children had lost their parents by death or abandonment, but the importance of loss, grief and mourning, and psychic trauma did not surface. Instead, emphasis was placed on improving the hygienic care and the physical surroundings.

1.1.2 *The alarm period*

In the 1930s and 1940s, the large number of deserted, displaced and suffering children as victims of the war, generated concern among the general public and professionals. The war traumas included years of suffering during imprisonment, malnutrition, concentration-camps experiences, loss of parents and families. Observers expected the children to be at severe psychological risk. In addition, the war had a severe negative impact on their social systems and involved breakup of families, inadequate housing as well as childcare.

In their observations of war trauma, Freud (Anna) and Burlingham (1943) pointed out the importance of the parents' reactions. Their hypothesis was that the psychological well-being of children correlated with their parents' sense of well-being. This gave rise to the belief that if parents remained "cool, calm, and collected" during traumatic events, no contagion, no panic, no fear, and no psychological sequelae on the part of the children would occur. The hypothesis perpetuated the myth that parents were to be blamed when showing their natural responses whilst under stress, and also, held parents responsible for the reactions of their children.

Spitz (1946), and later Bowlby (1969, 73, 80), introduced new theories about dysfunctional children suffering traumas of deprivation and parental loss. They introduced concepts such as anaclitic depression, the hospitalization-deprivation syndrome, and the affection-less character etc.

1.1.3 Period of syntheses

In the 1950s, the conclusions from earlier studies were reviewed more critically. The understanding of predisposing factors to the effects of trauma and stress-resistant children was central. Also, a more comprehensive understanding emerged of the role of primary and secondary prevention of psychopathology after trauma.

1.1.4 Beginning research

From the 1970s and 1980s systematic studies of posttraumatic stress reactions in children appeared. The studies included observations of reactions to warfare, psychological reactions of children versus adults, victimization covering events like rape, kidnapping, child abuse, incest, and also violence encompassing events such as homicide, suicide and rape.

In 1980, posttraumatic stress disorder (PTSD) was introduced as a diagnostic entity in the Diagnostic and Statistical Manual of Mental Disorders, DSM-III (American Psychiatric Association, 1980). The disorder was described by exposure to one or several stressors (criterion A) and a triad of symptom clusters subsequent to the traumatic experiences; reexperiencing or intrusion (criteria B), avoidance and

numbing (criteria C), and hyperarousal (criteria D). The disorder was not particularly related to children or adolescents until the DSM-III-R version (1987).

1.2 Current criteria of post-traumatic stress disorder (PTSD) in children and adolescents

According to the current version of the diagnostic manual, the DSM-IV (1994), the essential features of PTSD consist of three clusters of symptoms following the exposure to traumatic stressors. Figure 1 below illustrates the different criteria for the PTSD diagnoses; the traumatic stressor (criteria A) and three symptom clusters: reexperiencing (criterion B), avoidance and numbing (criterion C) and hyperarousal (criterion D). The diagnostic criteria also include duration of symptoms and level of impairment (criteria E and F).

□

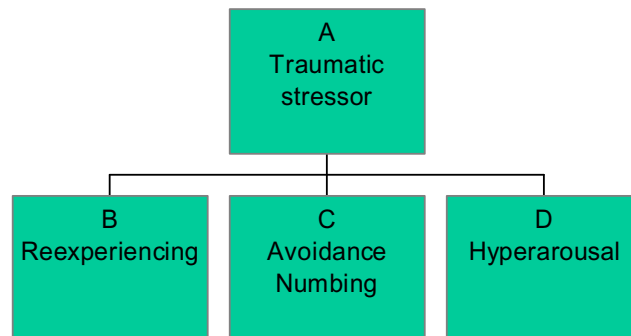


Figure 1 The PTSD Criteria A-D (DSM-IV)

Several researchers have pointed out that posttraumatic stress symptoms may differ substantially between children and adults (Scheeringa, Zeanah, Drell & Larrieu, 1995), and they have argued that the current definition of pediatric PTSD is unsound. The DSM-IV (1994) made a step forward in recognizing developmental modifications to Criteria A (experience of trauma) and B (reexperience). However, symptom clusters C (avoidance and numbing) and D (hyperarousal), did not undergo developmental modifications. Still, all cluster criteria must be met before the diagnosis is assigned to children and adolescents. A recent study by Carrion, Weems, Ray and Reiss (2002) demonstrated that the current diagnostic criteria C and D might not be appropriate, as children and adolescents with partial PTSD, i.e., did not fulfill all the diagnostic criteria, demonstrated substantial functional impairment and distress.

1.2.1 Traumatic stressor – criteria A

In the outline of the diagnostic features of PTSD in DSM IV (1994), a range of potential stressors or traumatic events are listed, see Table 1. The DSM IV states, that for children, stressors also encompass developmentally inappropriate sexual experiences without threats, violence or injury. Traumatic events may involve direct personal experience, as well as witnessing or learning about the traumatic events of others.

Table 1

Events that may constitute traumatic stressors (DSM-IV)

Witness	Victim	Experiences by others
<i>Witness events:</i> 1) observing the serious injury or unnatural death of person due to: a) violent assault b) accident c) war d) disaster 2) unexpected witnessing a dead body or body parts	<i>Being directly exposed to:</i> 1) military combat 2) violent personal assault: a) sexual assault b) physical attack c) robbery d) mugging 3) being kidnapped 4) being taken hostage 5) terrorist attack 6) torture 7) prisoner in concentration camp 8) disasters 9) accidents 10) life-threatening illness	<i>Learned about experiences by others (family member or close friend):</i> 1) violent personal assault 2) serious accident 3) serious injury

Assessments of the stressor include its objective magnitude or impact (criterion A1), as well as its subjective features (criterion A2), Table 2.

Criterion A1 is characterized by threats to life or potential harmful physical injuries with elements of grotesqueness or horror, demarcating these events from, e.g., the expected death of a loved one. Exposure to traumatic stressors involves direct personal experience of the event (victim) such as actual dangers that may entail death or serious injury of self or others (witness), or even, learning about unexpected or violent death or serious injury of family members or other significant persons.

Criterion A2 describes the acute reaction of surprise, terror, and the sense of helplessness. In children, the reactions may instead be expressed by disorganized or agitated behavior.

1.2.2 Reexperiencing – criterion B

The characteristic symptoms resulting from exposure to traumatic stressors include persistent reexperiencing reflecting the traumatic events (criterion B). Distressing, repeated and intrusive recollections of traumatic events include images, thoughts or perceptions as a cluster whilst awake or in dreams. In children, repetitive play involving themes or aspects of the trauma may be expressed. Also, children may have frightening dreams without recognizable content. One or more of the listed symptoms must be present to fulfill the criterion.

1.2.3 Avoidance and numbing – criterion C

The second group of symptoms includes persistent avoidance of stimuli associated with the trauma, and also numbing of general responsiveness (criterion C).

Avoidance of stimuli associated with the traumatic experience includes willful avoidance; the person decides not to think or talk about the event. Efforts to avoid feelings or reexperiences may also occur. In addition, places, activities or people that remind the person of what happened, may also be avoided.

Numbing of general responsiveness is a part of the criterion. This phenomenon covers manifestations that occur undeliberately, such as diminished interest in activities, feelings of estrangement from other people and inability to have loving feelings. Three or more of the symptoms must be present to fulfill the criterion C.

Table 2

The DSM diagnostic Criteria for Posttraumatic Stress Disorder (DSM IV)

Criteria	
A	The person has been exposed to a traumatic event in which both of the following were 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 reexperienced 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 in awakening or when intoxicated)
(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 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)	Hypervigilance
(5)	Exaggerated startle response
E	Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.
F	The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
<i>Specify if:</i>	Acute: if duration of symptoms is less than 3 months Chronic: if duration of symptoms is 3 months or more
<i>Specify if:</i>	With Delayed Onset: if onset of symptoms is at least 6 months after the stressor

* = criteria adjusted for children

1.2.4 Hyperarousal – criterion D

Physiological arousal following traumatic experiences are described in the third group of symptoms, criteria D. Hyperarousal includes sleep disturbances, irritability, difficulties concentrating and hypervigilance that were not present before the trauma. Also, increased startle response, such as exaggerated reactions to sudden or unexpected sounds are subsumed under this criterion. Two or more of the listed symptoms must be present to fulfill the criterion.

1.2.5 Duration of symptoms (criterion E) and level of impairment (criterion F)

The full symptom picture must be present for more than one month (Criterion E), and the disturbance must cause clinically significant distress or impairments in, e.g., social, work or school functioning (Criterion F).

1.2.6 DSM-IV and ICD-10

The classification of stress-related disorders in both the International Classification of Mental and Behavioral Disorders, ICD-10 (World Health Organization, 1992a, 1992b), and the Diagnostic and Statistical Manual of Mental Disorders, DSM-IV (1994), is based on pathogenesis, i.e., the development of symptoms associated with major stressors. Both systems require the presence of additional symptoms, but the criteria for the stressor and the symptom clusters differ (Andrews & Slade, 2002; Brewin, Andrews & Rose, 2000; López-Ibor, 2002). In DSM-IV (1994), the diagnostic criteria are described in detail while

in ICD-10 (1992a, 1992b) the diagnosis is less articulated with respect to specific symptoms. ICD-10 (1992a, 1992b) does not mention symptoms specific for children. All available assessment tools for PTSD in children and adolescents (Nader, 2004), refer to the DSM-IV (1994). Accordingly, DSM-IV (1994) was used in the current study.

1.3 Challenges in research on PTSD in children and adolescents

1.3.1 Traumatic stressors and peritraumatic reactions

Among researchers, the scope of the PTSD diagnosis has been subject to much debate, especially the role of the stressor (criteria A) (March, 1993). According to the DSM-IV (1994), the stressor involves assessment of the objective magnitude of the event (criterion A1), as well as the subjective features (criterion A2).

The literature suggests that in children, the objective magnitude of the stressor is proportional to the risk of developing PTSD. For example, in a study of a schoolyard sniper attack, the proximity of exposure was linearly related to the risk of subsequent PTSD symptoms (Pynoos et al., 1987). Similar findings of dose-response patterns were found in students after hurricane Hugo (Hardin, Weinrich, Weinrich, Hardin & Garrison, 1994), and in children after the earthquake in Armenia in 1988 (Pynoos et al., 1993).

The assessment of the objective features of other events tend to be more complex, e.g., child sexual abuse. Nevertheless, a number of characteristics of sexual abuse have been associated with post-trauma functioning (Conte & Schuerman, 1987; McLeer, Deblinger, Henry & Orvaschel, 1992; Oates, O'Toole, Lynch, Stern & Cooney, 1994; Rodriguez, Ryan, Rowan, & Foy, 1996; Ruggiero, McLeer & Dixon, 2000). The severity,

frequency and duration of the sexual abuse, are associated with psychological and somatic health problems, as well as with PTSD symptoms (Bendixen, Muus & Schei, 1994, Rodriguez et al., 1996, Ruggiero et al., 2000).

Lately, the interactions between objective and subjective features of the stressors and their roles in the etiology of PTSD have gained more interest among researchers. In a study of adolescents surviving a hurricane, Goenjian et al. (2001), found that both objective features of the event (criterion A1), and horror and helplessness (criterion A2), independently contributed in the prediction of PTSD.

The subjective perception of life threat has also been found to play an important role in development of PTSD in children exposed to road traffic accidents (Bryant, Mayou, Wiggs, Ehlers & Stores, 2004; Ehlers, Mayou & Bryant, 2003). Other researchers have shown that objective features of such events, e.g., type of accidents and physical injury, were not associated to the level of PTSD in children (Stallard, Velleman & Baldwin, 1998; Stallard, Salter & Velleman, 2004).

Exploring the interactions between objective and subjective features of the stressors, requires comprehensive assessments of both the objective magnitude of the stressor (criterion A1), as well as the subjective features of the stressor (criterion A2). Unfortunately, the instruments published to assess PTSD have mainly focused on behavioral and symptomatic sequelae (criteria B, C and D), while little emphasis has been placed on the objective aspects of the stressor and the subjective responses.

In addition to the stressor, as described by DSM-IV, a number of additional factors related to the traumatic event may contribute in the predictions of PTSD.

Firstly, researchers have suggested that subjective responses which are currently not included in the criterion A2 in DSM-IV (1994), such as anger, guilt, and shame may play important roles in the etiology of PTSD (Brewin, Andrews & Rose, 2000). So far, these aspects have not been adequately studied in children and adolescents.

Secondly, also the roles of other peritraumatic reactions, including: 1) physiological arousal, 2) dissociation, and 3) cognitive reactions are subject to growing interest.

Physiological arousal includes sensations such as increased heart rate, sweating, nausea and a sense of constricted breathing. In adults, peritraumatic arousal has been associated with subsequent panic attacks (Nixon, Resick & Griffin, 2002) and development of PTSD (Shalev et al., 1998). Children also report intense physiological reactions during traumatic events (Pfefferbaum et al., 1999), but the relevance of this arousal in the etiology of PTSD in children and adolescents has not been sufficiently studied.

Additionally, the relationship between trauma and dissociation has gained increasing attention (Putnam, 1985; Spiegel, 1984). Some studies of traumatized populations have indicated that peritraumatic dissociative reactions significantly predict posttraumatic stress reactions (Holen, 1993; Johnson, Pike & Chard, 2001; Koopman, Classen & Spiegel, 1994; Marmar et al., 1994; Marmar, Weiss, Metzler, Ronfeldt & Foreman, 1996; Marmar et al., 1999; Tichenor, Marmar, Weiss, Metzler & Ronfeldt, 1996). Dissociative reactions are also significant components of children's traumatic reactions (Briere et al., 2001; Fein, Kassam-Adams, Vu & Datner, 2001; Goenjian et al., 2001; Kisiel & Lyons, 2001; Lansford et al., 2002; Putnam, 1993). The role of peritraumatic dissociation in the etiology of PTSD in children, however, still remains unexplored.

Also, knowledge is limited about cognitive reactions during the event, and also, the understanding of their role in the subsequent development of PTSD. The cognitive reactions to danger may include intervention thoughts, i.e., thoughts or fantasies of altering the precipitating events, or having the traumatic action interrupted by self or others (Pynoos & Nader, 1989).

1.3.2 PTSD reactions in children and adolescents

Since the 1980's, a range of events, such as child abuse (Ackerman, Newton, McPherson, Jones & Dykman, 1998; Deblinger, McLeer, Atkins, Ralphe & Foa, 1989; Lipschitz, Winegar, Hartnick, Foote & Southwick, 1999; McLeer, Deblinger, Atkins, Foa & Ralphe, 1988), community violence (Horowitz, Weine & Jekel, 1995; Kilpatrick et al., 2003), chronic illness (Connolly, McClowry, Hayman, Mahony & Artman, 2004; Pelcovitz et al., 1998; Stuber, Nader, Yasuda, Pynoos & Cohen, 1991), accidents (de Vries et al., 1999; Ellis, Stores & Mayou, 1998; Stallard et al., 1998; Winje & Ulvik, 1998; Yule & Williams, 1990), war trauma (Adjukovic, 1998; Macksoud & Aber, 1996; Mollica, Poole, Son, Murray & Tor, 1997; Nader, Pynoos, Fairbanks, Al-Ajeel & Al-Asfour, 1993) and disasters (Earls, Smith, Reich & Jung, 1988; Goenjian et al., 2001; Handford et al., 1986; Hardin et al., 1994; Pynoos et al., 1993) have been studied. They have been found to have the stressor characteristics that may lead to posttraumatic stress reactions in children and adolescents.

The reported prevalence of PTSD varies across populations. The diversity may be explained by a number of factors such as measurement tools, severity and chronicity of trauma, proximity to the trauma, and the time elapsed since the traumatic event.

Fletcher (1996) conducted a meta-analysis including 2697 children from 34 samples who had experienced trauma. He concluded that 36% of children met the criteria of PTSD.

In the current study, three potential stressors will be explored; *child sexual abuse*, *community violence* and *accidents*.

Child sexual abuse

The idea that sexually abused children suffer negative emotional and behavioral consequences as a result of their experiences, has gained wide acceptance (Browne & Finkelhor, 1986; Kendall-Tackett, Williams & Finkelhor, 1993). Although sexually abused children may exhibit a wide range of seemingly disparate symptoms, there has been growing recognition of the assumption that many of the symptoms fall within the diagnostic criteria of posttraumatic stress disorder (Deblinger et al., 1989; Goodwin, 1988; McLeer et al., 1988). Prevalence figures of PTSD after child sexual abuse vary. Deblinger et al. (1989) found 21% of the sexually abused children to have PTSD, while McLeer et al. (1988) reported a rate of 48%. In two recent studies of sexually and physically abused adolescents, about one third had PTSD (Ackerman et al., 1998; Lipschitz et al., 1999). The long-term perspectives of sexually abused children seem alarming. In a prospective follow-up study of young adults nine years after child sexual abuse, Swanston et al. (2003) found significant problems of depression, self-esteem, anxiety, behavior and despair.

In extrafamilial matters, special concern has been given to sexual abuse of children in institutions. Such events may be extremely difficult for the children and their

families (Waterman, Kelly, Oliveri & McCord, 1993). Reports of child sexual abuse in day care programs vary in terms of victims and perpetrators, length and complexity of subsequent legal proceedings (Finkelhor, Williams & Burns, 1988). Despite the fact that a number of institutions throughout the world have been faced with alleged sexual abuse of children and adolescents, few systematic studies have been conducted (Socialstyrelsen, 1999; Waterman et al., 1993). Hence, the current knowledge about the impact on children and their families is insufficient.

Community violence

Children and adolescents experiencing community violence either as victims or as witnesses seem to be at high risk of developing PTSD (Black, Harris-Hendriks & Kaplan, 1992; Horowitz et al., 1995; Kilpatrick et al., 2003; Malmquist, 1986; Pynoos & Nader, 1988). Community violence may include stabbing, shooting, homicide, muggings, and beatings. Few studies have comprehensively assessed the concomitant experiences and reactions. This lack of systematic knowledge may result in insufficient understanding of the nature of the experiences, and subsequently, intervention programs may fail in preventing PTSD.

Accidents

Reports suggest that children's responses to serious accidents like the capsizing of a ship, include posttraumatic stress reactions (Yule & Williams, 1990). Until recently, little attention has been paid to children's psychological responses to one of the most common forms of trauma, traffic accidents. In a study conducted by Stallard et al. (1998),

one third of the children involved in road traffic accidents fulfilled the diagnostic criteria for post-traumatic stress disorder six weeks after the accident. Ellis et al. (1998) found high levels of PTSD symptoms of avoidance in 50% of the children 4 - 7 months after the accidents. In a study by de Vries et al. (1999), twenty-five percent of the children fulfilled the criteria for PTSD 7 to 12 months after the accidents. In a one-year follow-up study of a bus accident, the majority of the children reported medium to high levels of PTSD symptoms (Winje & Ulvik, 1998). Some accidents expose groups of children and adolescents to the same event, e.g., bus accidents, train accidents etc. From a research perspective, such situations are particularly suitable for studies of the course of PTSD symptoms over time, due to the homogeneity of the stressor and the random selection of subjects. The spontaneous healing course of recovery from PTSD in children and adolescents after traumatic events is of great interest (Appelbaum & Burns, 1991; Nader, Pynoos, Fairbanks & Frederick, 1990), both in planning interventions and in the provision of information to children, adolescents and families.

1.3.3 Co-existing factors and PTSD reactions

1.3.3.1 Pre-trauma factors

The development of PTSD after traumatic events depends on biological, psychological and social factors. “Vulnerability” factors place the individual at greater risk for developing PTSD (Foy, Madvig, Pynoos & Camilleri, 1996), in contrast to “protective” or “resilience” factors. Vulnerability factors in themselves do not lead to PTSD, but their presence will increase the risk. Studies on PTSD in children have

explored the relevance of age, gender, socioeconomic status, prior psychopathology, adverse life events and prior traumas.

For age, the findings are mixed. Some report that younger children (2-6 years old) have more symptoms (Dawes, Tredoux & Feinstein, 1989; Green et al., 1991). Others report positive correlations between age and levels of PTSD (Lonigan, Shannon, Finch, Daugherty & Taylor, 1991; Nader et al., 1990; Pynoos et al., 1987) and some do not find any association between age and PTSD (Wolfe, Gentile & Wolfe; 1989). In Fletcher's meta-analysis (1996), the prevalence rates of PTSD did not differ markedly across age groups. Following a range of traumatic events, he found that 39% of preschoolers (less than 7 years old), 33% of school-aged children (6-12 years old) and 27% of teenagers (over 12 years old) were diagnosed with PTSD (Fletcher, 1996).

For gender, the findings are also inconclusive. Although higher distress scores have been reported for girls, these studies did not control for differences in lifetime exposure (Foy et al., 1996).

Other pre-trauma variables of special interest in the etiology of PTSD, are events that previously produced distress in the child's life, e.g., adverse life events and prior traumas. The resulting distress may increase in an additive fashion; studies have shown that recurrent traumas increase the risk of developing PTSD (Abram et al., 2004; Dube, Felitti, Dong, Giles & Anda, 2003).

1.3.3.2 Post-trauma factors

Secondary adversities

Traumatic events are frequently associated with secondary stress factors such as relocation, attendance at new schools, separation from siblings or parents, unemployment of a parent, and financial difficulties (Pynoos et al., 1993). After exposure to war, malnutrition, deprivation, and forced migration may represent secondary stress factors that put additional strain on the families. Also, medical treatment and rehabilitation after physical injuries may increase distress. Both in clinical and research settings, the differentiation between the effects of the primary stressor and the subsequent secondary adversities are often inadequate.

Associated psychiatric and psychosocial factors

Children and adolescents suffering from PTSD may display additional psychiatric or psychosocial problems. As in adults, PTSD in children and adolescents is a highly comorbid condition, often associated with anxiety and mood disorders (Ackerman et al., 1998; Famularo, Fenton, Kinscherff & Augustyn, 1996; Goenjian et al., 2001; Lipschitz et al., 1999). In the study by Saigh, Yasik, Oberfield, Halamandaris & McHugh (2002), traumatised youth with PTSD displayed significantly higher levels of behavior problems than controls and traumatised youth without PTSD. Hence, traumatic experiences may not only induce posttraumatic stress reactions, but also psychosocial impairments in a vulnerable period of life.

1.3.4 Family perspectives of child trauma

Already in early studies of trauma in children (Freud & Burlingham, 1943), the family perspective of child trauma was studied. Positive relationships between parental and child distress in response to shared traumatic experiences have been found in wars (Dawes et al., 1989), technical disasters (Green et al., 1991) and fires (Jones, Ribbe, Cunningham, Weddle & Langley, 2002). Also, traumatic experiences in children and adolescents may initiate parental PTSD symptoms. After extrafamilial child sexual abuse, parents developed PTSD reactions in response to their child's trauma (Davies, 1995; Kelley, 1990; Manion et al., 1996; Timmons-Mitchell, Chandler-Holtz & Semple, 1996), and similar findings have been made in parents of children and adolescents with life threatening illnesses (Kazak et al., 2004).

Accordingly, the impact on the family cannot be ignored when assessing children and adolescents after traumatic events. Rather than focusing solely on the child's experiences, comprehensive assessments of the family system and its members are essential.

1.3.5 Validity of symptom criteria B, C and D of PTSD (DSM-IV)

Researchers in the field of children's PTSD are confronted with three main challenges in conducting assessments of the symptom criteria B, C and D of PTSD (DSM-IV, 1994): 1) Conducting PTSD assessments by valid instruments according to DSM-IV criteria, 2) Taking into account that the current DSM criteria may not capture the whole

picture of posttraumatic stress symptoms in children and adolescents, 3) Incorporating more than one person to observe the reactions of the child.

Firstly, assessment tools should provide valid information of the triad of symptoms following a traumatic experience; reexperiencing, avoidance/numbing and hyperarousal, and include assessments of symptom severity or frequency. In addition, psychometric properties, such as the capacity of the instrument to detect the symptoms, interrater agreement and test-retest reliability should be satisfactory established (Carrion et al., 2002; March, 1999). Both categorical and dimensional assessment tools have been published for assessing PTSD in children and adolescents (Nader, 2004). Categorical measures of PTSD include, e.g., Children's PTSD Inventory (Saigh, 1989) and Clinician-Administered PTSD Scale - Child and Adolescent Version (CAPS-CA) (Nader, Blake, Kriegler & Pynoos, 1994). The perhaps most widely used dimensional measure of PTSD reactions, is The Reaction Index (PTSD-RI). Various versions of the index have been employed in studies of natural disasters (Pynoos et al., 1993), criminal assault (Nader et al, 1990) and war zone trauma (Nader et al., 1993). The instrument show modest empirical support as a semi-structured interview for making the categorical diagnosis of PTSD (Goenjian et al., 1994; Rodriguez, Steinberg, Saltzman & Pynoos, 2001).

Secondly, even though children demonstrate many of the same PTSD symptoms as adults (Eth & Pynoos, 1985; Fletcher, 1996; Yule, 1992), this does not support the contention that child and adult PTSD are identical in every respect. A number of studies have identified children with subsyndromal but clinically significant PTSD (Carrion et al., 2002; Scheeringa et al., 1995; Scheeringa, Zeanah, Myers & Putnam, 2003). The PTSD

criteria are based on research in adults, and limited adjustments have been made for PTSD in children (criterion A and B). Researchers have recommended further adjustments of criteria C and D (Carrion et al., 2002). As a result of the incomplete state of the diagnostic entity for PTSD in children and adolescence, partial diagnoses in DSM-IV may represent substantial functional impairment and distress.

Thirdly, some researchers find that both children's and parents' reports are required to obtain the most reliable and comprehensible data on posttraumatic stress in children and adolescents (Costello, Angold, March and Fairbanks, 1998). Children's reports of distress often do not mimic those of their parents'. In some cases, the parents seem to minimize their children's response to trauma (Handford et al., 1986). Agreements have generally been lowest for internalizing symptoms, and highest for more observable externalizing symptoms (Achenbach & Rescorla, 2001). If only one group of informants must be chosen, Weismann et al. (1987) recommended that the children are to be interviewed.

1.4 Aims of the study

The main aims of the study:

- 1) To explore the role played by traumatic stressors, peritraumatic reactions and co-existing factors in relation to PTSD reactions in children and adolescents; addressed by papers I, III and IV.
- 2) To explore the family perspective of child trauma by assessing parental distress and the development of PTSD reactions; addressed by paper II.
- 3) To explore possible differences in reports from multiple observers with regard to children's posttraumatic stress reactions; addressed by paper IV.

2. Material and methods

2.1 Participants

Three different samples were included in this study to address the aims of the study and to elucidate the experiences of child trauma from both the child and the parent perspective. In the first sample, parents' descriptions of the stressor and the children's reactions were assessed. The parents also reported on their levels of distress. In the second sample, adolescents were interviewed face-to-face, describing in detail the objective and subjective features of their traumatic events in the community, and their subsequent PTSD reactions. In the third sample, multiple informants were included in the assessments of traumatized children.

Table 3

The table shows the participants and the corresponding papers in the study.

Samples	Participants (N)	Papers
1	32 children 39 parents	I II
2	51 adolescents	III
3	16 children	IV

2.1.1 Sample 1: Children and parents

After alleged sexual abuse at a day care center, parents and children experienced a cascade of stressful events over a long period of time. For parents, the cascade included hearing the children's reports of abuse, being interviewed by the police, testifying in court,

hearing the verdict and being exposed in the media. The children came forward with reports of abuse, attended one or more forensic interviews and medical examinations. Videos of their forensic interviews were taken and shown in the courtroom. In addition, they experienced extended media coverage of the case.

Accordingly, the sample of both children and parents were suitable for assessments of the impact of the cascade of stressful events in the wake of alleged sexual abuse.

The subjects were recruited from a therapy program developed by the Department of Child and Adolescent Psychiatry, Trondheim, Norway. Forty families were enrolled. Four years after the reported sexual abuse, they were invited to participate in the present study. Twenty-five families (62.5%) agreed to participate, five (12.5%) families declined and 10 (25 %) did not respond to the invitation. The 25 participating families represented 32 children (24 girls and 8 boys) and 39 parents (24 mothers and 15 fathers). The mean age of the children at the four year follow-up was 9.3 years (range 6-12), and the mean age of their parents was 39.2 years (SD=6.4).

2.1.2 Sample 2: Adolescents

Fifty-one adolescents that had experienced diverse single-incident traumatic events were included. In contrast to the younger children, the adolescents were able to describe comprehensively the objective and subjective features of their traumatic experiences. The sample was suitable for assessing both subjective and the objective features of the stressor and the peritraumatic reactions.

The participants were recruited from a school-based trauma intervention program at a middle school in a low-SES urban community outside Los Angeles, California, USA. The sample included 51 adolescents in grades 6-8, with a mean age of 13 years (SD=1.0).

2.1.3 Sample 3: Children

The sample consisted of a group of children that were on their way to school in a tramcar that collided with another tramcar. The passengers sustained injuries by being slung against windows, walls or other solid objects. None of the children had life-threatening injuries, yet the majority complained of pain, nausea or discomfort from the battering and sustained injuries such as haematomas, bruises, cuts or injured teeth.

Their parents were unexposed to the event. By including both parents and children as informants about the children's PTSD reactions, comparisons of their reports were possible.

Through the Department of Child and Adolescent Psychiatry, Trondheim, Norway, sixteen children were recruited to the study; six boys and ten girls. The mean age of the children was 9.1 years (age range 7 - 12,5) at the time of the accident. Assessments were made five weeks (T₁) and six months (T₂) after the event.

2.2 Instruments

Three main groups of variables were used for this study; assessments of the stressors, the levels of PTSD reactions and co-existing factors. In the data collection, interviews, questionnaires and assessment scales were used, as outlined in Table 4.

Table 4

The table shows instruments applied for the three main groups of variables in this study.

Papers	Participants	Stressor	PTSD reactions	Co-existing factors
I	32 children	<i>Parent Interview (CSA)*: Child section</i> The cascade of stressful events for children.	<i>Parent questionnaires:</i> Child Posttraumatic Stress Reaction Index- Parent Questionnaire (CPTS-RI). <i>Child Behavior Check List (CBCL)</i>	<i>Parent Interview (CSA)*: Child section</i> Secondary adversities. Adverse life events in family. Child's psychosocial functioning prior to event.
II	39 parents	<i>Parent Interview (CSA)*: Parent section</i> The cascade of stressful events for parents.	<i>Questionnaire:</i> Impact of event scale (IES)	<i>Parent Interview (CSA)*: Parent section</i> Sociodemographics. Secondary adversities. Social support. <i>Questionnaires:</i> General Health Questionnaire (GHQ) Locus of Control of Behavior (LCB)
III	51 adolescents	<i>Adolescent Interview:</i> Objective and subjective features of traumatic event (A1 and A2) and peritraumatic reactions of physical arousal, dissociation and intervention thoughts <i>Questionnaire:</i> Community violence exposure survey (CVES)	<i>Adolescent Interview:</i> PTSD-index (Adolescents version) and associated features	-
IV	16 children	<i>Parent Interview (TA)*:</i> Objective features of the tramcar accident, medical injuries and physical complaints. Parents' subjective reactions to the event.	<i>Parent questionnaire:</i> Child Posttraumatic Stress Reaction Index- Parent Questionnaire (CPTS-RI) <i>Child Interview:</i> Child Posttraumatic Stress Reaction Index (CPTS-RI)	<i>Parent Interview (TA)*:</i> Child's psychosocial functioning prior to the event. <i>Assessment scale for clinicians:</i> Children's Global Assessment Scale (CGAS)

*Abbreviations:

CSA Child Sexual Abuse

TA Traffic Accident

2.2.1 Interviews

2.2.1.1 Parent Interview (CSA)

A comprehensive, semi-structured interview for parents was developed by the author (GD), and applied for data collection in paper I and II. The interview consisted of a *child section* and a *parent section*. A brief overview of the variables from the interview is outlined:

Child section

The section covered the following issues:

1) Cascade of stressful events for children

- *Reports of sexual abuse:* Children's exposure to child sexual abuse (CSA) were categorized according to the most severe CSA report the children had made (Appendix 1):
 - no sexual abuse:* reports of physical abuse, threats or behavior changes
 - less intrusive sexual abuse:* child instructed to expose genitals, fondling child's genitals or oral-genital contact
 - highly intrusive sexual abuse:* digital, anal or vaginal penetration and other acts involving semen
- *Exposure to subsequent events:* medical examination, forensic interviews, exposure in court and media coverage (dichotomous and categorical variables for each event)

-Medical examination was scored positive if the child had been examined at the paediatric unit's CSA department.

-Forensic interviews were scored positive whenever a child had attended at least one.

-Exposure in court: children did not appear in court, but when video's of the child's interview was shown in the courtroom, exposure in court was scored positive.

-Media coverage was scored as positive if the child had been exposed to "a lot" or "a whole lot" of the media coverage in relation to the events.

2) *Co-existing factors for children*

- *Relocation of home*
- *Adverse family events:* parent's separation or divorce, serious illness or death of parent or other significant person
- *Psychosocial impairment prior to the events:* considerable worries about the child's psychological or physical development, or behavior problems

Parent section

This section covered the following issues:

1) *The cascade of stressful events for parents*

- *Reports of sexual abuse:* Parents' exposure to CSA reports were categorized according to the most severe sexual abuse report from their child (or from either of their two children when siblings were involved), ref. above.

- *Exposure to subsequent events:* Three dichotomous variables were created to assess exposures to the following experiences: police interview, court testimony, and media coverage. Experiences were scored positive if parents gave formal statements to the police in interviews, and if they were called to give testimony in court. Media exposure was defined as having at least one family member portrayed either by name, picture, drawing or other information (age, occupation etc) in the coverage of the events.

2) *Co-existing factors for parents*

- *Secondary adversities:* One composite variable reflected secondary life changes (range 0-4):
 - relocation of home after the events
 - major changes of daily activities (childcare, work and daily routines)
 - changes of spare time activities
 - change of friends
- *Social support:* Parents rated their perceptions of social support from three potential sources; their family, friends/neighbors, and colleagues on a five point scale (1=none, 2=a little, 3=some, 4=a lot, 5=a whole lot).

2.2.1.2 Adolescent Interview

In the interviews of adolescents in California (paper III), participants started with a brief writing exercise in which they were asked a series of questions about traumatic incidents they had experienced, including the precipitating circumstances, what happened

during the event, and the immediate consequences. Twelve items followed that assessed the objective criterion A1 and the subjective criterion A2, features that define the traumatic event. All twelve items were rated on a five-point intensity scale (0 = none, 1 = a little, 2 = some, 3 = a lot, 4 = a whole lot). Scores were then recoded dichotomously for further analyses (0, 1, 2 = 0; 3, 4 = 1) to assure that positive scores represented higher intensity ratings as outlined in Criterion A.

Moreover, to assess peritraumatic reactions of physiological arousal, dissociation and intervention thoughts, three new scales were developed for the study (Rodriguez, 2004). All items of the three scales were rated on a five-point intensity scale (0 = none, 1 = a little, 2 = some, 3 = a lot, 4 = a whole lot). Three items described physiological reactions at the time of the trauma, including increased heart and respiration rate, and perspiration. A five-item scale was developed to capture reports of dissociation at the time of the traumatic experience (PD), including derealization, depersonalization, and alterations in perception of time or place. Three items described intervention thoughts (INT) at the time of the trauma, including alterations of the precipitating events, or interruptions of the traumatic scene by self or others.

The last part of the interview included the PTSD index (Rodriguez, Steinberg, Saltzman & Pynoos, 2001; Steinberg, Brymer, Decker & Pynoos, 2004). The symptom scale contained 20 items and assessed the 17 DSM-IV PTSD symptoms. Fourteen symptoms were assessed by one item each, and three symptoms were assessed by two items each. Moreover, two additional items assessed the associated features of fears of reoccurrence of the traumatic event, and trauma related guilt. Participants used a rating

sheet to respond to each item on a 5-point scale according to the frequency of occurrence during the past month. “Never” = 0, “a little of the time” (e.g., two times a month) = 1, “some of the time” (e.g., 1-2 times a week) = 2, “much of the time” (2-3 times a week) = 3, and “most of the time” (e.g. almost daily) = 4. The items were summed up to generate a PTSD symptom total score (range 0-76), including the 17 PTSD symptoms plus the two items for the associated features. Prior psychometric studies on the same clinical population as reported in this study (31) indicated that the internal consistency and test-retest reliability of the Index total score is high (Cronbach’s alpha = .92; Pearson’s r = .84). Furthermore, the criterion-related validity of the Index total score in diagnosing PTSD was high with sensitivity = .93 and specificity = .87. In the current study, the Cronbach’s alpha of the internal consistency of the Index total score was .89.

2.2.1.3 Parent interview, TA

A second semi-structured interview for parents was developed by the author (GD), and applied in paper IV. The following topics were covered; the child’s general level of development, and, the general health prior to the traffic accident (TA), objective features of the accident including descriptions of what happened to each child, as well as medical injuries and physical complaints, and parents’ subjective reactions to the event.

2.2.1.4 Child Interview (CPTS-RI)

In the interviews of the children after the tramcar accident, the Norwegian version of Child Post-traumatic Stress Reaction Index (CPTS-RI; copyrighted by Fredericks,

Pynoos & Nader, 1992) was applied as a structured interview (paper IV). The translation was completed (GD) in collaboration with one of the instrument's authors (K. Nader) and the translation and back-translation method was used. The CPTS-RI is a 20-item scale including a 5-point Likert frequency rating scale ranging from "none" (0) to "most of the time"(4). Although the index does not directly provide a DSM PTSD diagnosis, a scoring system establishes the level of "PTSD": 12 - 24 indicates a mild level of PTSD reaction; 25 - 39 a moderate level; 40 - 59 a severe level; > 60 a very severe reaction (Nader, 2004).

2.2.2 Questionnaires

2.2.2.1 Community violence exposure survey (CVES)

The adolescents in California completed the Community Violence Exposure Survey (CVES) (Saltzman, Layne & Steinberg, 1998), to have their trauma assessed (paper III). The CVES is a 24-item self-report inventory, measuring exposure to community violence. The instrument is adapted from the widely used Survey of Exposure to Community Violence (Richters & Saltzman, 1989). The CVES assesses three possible kinds of youth's exposure to violent events: direct victimization, witnessing incidents, and hearing about incidents. Violent events ranged from being shot, shot at, stabbed with a knife, and beaten, to being seriously injured in an accident. Each participant reported experiencing one or more past traumatic events that continued to distress them at the time of the study.

2.2.2.2 Child Behavior Check List (CBCL)

The CBCL is a standardised instrument for assessing a broad array of psychopathological manifestations in children, and the scale has been widely used in studies of sexually abused children (Achenbach, 1991). CBCL includes 113 items about various kinds of behaviours. The items are scored as follows: 0 if the item is not true of the child, 1 if the item is somewhat or sometimes true, and 2 if it is very true or often true. CBCL generates eight syndrome scale scores: withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour and aggressive behaviour.

The syndrome scales “withdrawn”, “somatic complaints” and “anxious/depressed” are grouped under the label “internalizing”. The syndrome scales called “delinquent behaviour” and “aggressive behaviour” are grouped under the label “externalizing”.

2.2.2.3 Impact of Event Scale (IES)

Parents’ PTSD symptoms were assessed by using the Impact of Event Scale, IES (Horowitz, Wilner, & Alvarez, 1979). The instrument was applied in paper II. The IES version used, consists of a 15-items self-report scale and measures the symptoms clusters of intrusion and avoidance in PTSD. Items are rated on a 4-point intensity scale (0,1,3, and 5). Eid, Thayer, and Johnson (1999) reported the Norwegian translation of the scale to have good internal consistency and moderate test-retest reliability. The intrusion and avoidance scores were transformed into high (score>19), medium (score 9-19) and low (<9), according to the cut-off values given by Horowitz (1982). Parents rated the intensity

of their PTSD symptoms over the 7 days prior to the research interview. IES variables were applied in paper II.

2.2.2.4 Child Post-traumatic Stress Reaction Index (CPTS-RI) - Parent Questionnaire

The questionnaire is adapted to parents and accompany the Child Post-traumatic Stress Reaction Index (CPTS-RI). Based on observations of their child, the parents were asked to score the child's reactions. The two instruments contain the same items, and have identical ratings; they were used in paper IV.

2.2.2.5 General health questionnaire (GHQ-30)

Parents completed the General Health Questionnaire 30, a standardized self-report instrument measuring general psychological wellbeing. The instrument contains subscales of coping failure, depression, anxiety, social dysfunction and wellbeing (Goldberg & Williams, 1988).

Several researchers have used the Norwegian translation of the GHQ-30 (Malt, 1989). The items address unpleasant emotions and inability to continue normal functioning. Each item consists of a question asking whether the respondent has experienced a particular symptom or behavior in the last 2 weeks. The scale is ranging from "less than usual" to "much more than usual". The four-point response scale may be scored in two ways; the Likert score (0-1-2-3) capturing symptom intensity, and the GHQ score (0-0-1-1), aiming at case finding. In this study the 0-0-1-1 scoring was applied.

Goldberg and Williams (1988) have suggested that a cutoff score of 5 is used to identify caseness of significant psychopathology.

2.2.2.6 Locus of Control of Behavior

Locus of Control of Behavior is a self-report scale that measures the extent to which subjects assume personal responsibility for their behavior (Craig, Franklin & Andrews, 1984). Persons who find that they exercise control over their lives are considered to be internally controlled. On the contrary, those who believe that their destinies are beyond their own control and are determined by fate, chance, or powerful others are seen as externally controlled. The scale consists of 17 items, scored 0 - 5 (0 = disapprove, 5 = approve); 10 items relate to externality and 7 items to internality. The seven internality items are inversed, and a total externality score computed including all 17 items. Accordingly, higher scores indicate externality. Craig et al. (1984) reported that the internal consistency and test-retest reliability of the scale items were high.

2.2.3 Assessment scale: Children's Global Assessment Scale (CGAS)

The children's overall functioning level was assessed by clinicians five weeks (T_1) and six months (T_2) after the tramcar accident (paper IV). The Children's Global Assessment Scale, CGAS, was employed for this purpose. The instrument is a modification of the Global Assessment Scale (GAS) for adults, designed to assess the lowest level of functioning of the child or adolescent during a specified time period (Shaffer et al., 1983). Satisfactory inter-rater reliability, discriminant validity and clinical

usefulness have been reported for CGAS (Bird, Canino, Rubio-Stipec & Ribera, 1987).

The values of the scale range from 1 to 100, 1 represents the most functionally impaired child, and 100 represents the most healthy and well functioning child. Scores above 70 on the CGAS indicate normal function.

3. Summary of papers

3.1 Paper I: Posttraumatic stress reactions and behavior problems in children four years after alleged sexual abuse in daycare

The report describes the cascade of stressful events experienced by children in a case of alleged sexual abuse at a day-care program. The study assessed children's posttraumatic stress reactions and behavior problems four years after the alleged abuse. Factors associated to the distress were explored. Parents of 32 children were interviewed about demographic data, psychosocial impairment prior to the alleged abuse, family life events, the contents of the child's reports of sexual and physical abuse and threats, exposure to forensic interviews, medical examination, court experiences and media exposure. Children's current distress reactions and behavior problems were assessed by standardized measures.

Half the children displayed high levels of posttraumatic stress reactions at the four years follow-up. Older children showed significantly more signs of posttraumatic stress. Anxiety, depression, somatic complaints and social problems correlated significantly with posttraumatic stress, and the relationships were unrelated to the age of the child.

The results indicate that children may be in need of long-term services in similar situations.

3.2 Paper II: Alleged sexual abuse at a day care center: Impact on parents.

The cascade of stressful events and secondary life changes experienced by parents in a case of alleged sexual abuse at a day-care program was described in this report. Thirty-nine parents participated in the study. Symptoms of posttraumatic stress disorder (PTSD) and general psychological responses to the stressful events were assessed four years after the alleged abuse. Predictive factors of chronic parental distress were also explored.

Learning about the sexual abuse reports, testifying in court, hearing the verdict and being exposed in the media, were all rated by the parents as distressing events. Moreover, the majority of the parents experienced secondary life changes after the alleged sexual abuse.

One-third of the parents reported high levels of PTSD intrusive symptoms, and one-fourth reported high levels of PTSD avoidance symptoms. Secondary life changes and externality from the locus of control significantly predicted chronic posttraumatic stress reactions. Hearing about the sexual abuse and the subsequent events related to the media and juridical system, did not turn out to predict the level of PTSD symptoms.

PTSD reactions correlated significantly with the level of general psychological health problems in the lives of the parents.

The study demonstrates that the alleged sexual abuse of children in day care, the subsequent events in the legal system and the media, and secondary adversities involve significant and chronic distress in the lives of the parents. The findings underscore the need to include parents in trauma interventions.

3.3 Paper III: Subjective Features of Traumatic Experiences and PTSD in Adolescents

The study investigated the relationships between objective and subjective features of traumatic experiences and the severity of subsequent PTSD reactions among youth that had experienced single-incident traumas. The sample consisted of 51 multi-ethnic youth participants in a school-based intervention program serving a low socio-economic status urban community outside of Los Angeles in California. The youth completed a brief standardized self-report screening measure of exposure to traumatic events, and a follow-up interview assessed their trauma history, the severity of the peritraumatic reactions, and the current level of PTSD reactions. Current PTSD reactions were significantly associated to four factors describing peritraumatic reactions; intense emotional reactions, physiological arousal, dissociation and intervention thoughts. Regression analyses indicated that these variables accounted for 40% of the variance in current PTSD reactions. The findings underscore the importance of subjective features of traumatic experiences in the PTSD etiology. Comprehensive assessments of traumatic experiences need to include these factors both in research and in clinical practice.

3.4 Paper IV: Parent-child discrepancy in reporting children's post-traumatic stress reactions after a traffic accident

The study examined possible parent-child discrepancies in the reporting of post-traumatic stress reactions in 16 children after a tramcar accident.

Sixteen children exposed to the same accident, were interviewed about post-traumatic stress reactions at five weeks and at six months after the event. Independently, the parents' reported their child's degree of posttraumatic stress reactions. Clinicians also assessed the children's level of general functioning.

Five weeks after the accident, the children reported significantly more posttraumatic stress reactions than observed by their parents. The parent-child discrepancy was more pronounced for younger children. The levels of children's self-reported posttraumatic stress reactions decreased significantly from the first to the second assessment. Six months after the accident, at the second assessment, no significant parent-child discrepancy was observed. The children showed normal levels of functioning despite their reports of posttraumatic stress reactions.

The reported parent-child discrepancy indicates that assessments of children's posttraumatic stress reactions are best obtained directly from the children.

4. General discussion

4.1 PTSD reactions in children and adolescents

The role of the stressor and peritraumatic reactions

This study adds new findings to the research about the stressor in posttraumatic stress reactions of children and adolescents.

Four years after the alleged abuse, half the children showed high levels of PTSD reactions (paper I). This group of children reported more severe CSA, were more exposed to media coverage and had more involvement in the court trial than the rest. The differences in levels of exposure, however, were not statistically significant. The components of the cascade described only objective features of the stressor. Descriptions of the subjective reactions to the events might have added valuable information to the role of the stressor in the subsequent PTSD reactions.

In the adolescents, the subsequent levels of PTSD reactions were significantly associated to four kinds of peritraumatic manifestations; intense emotional reactions, physiological arousal, dissociation and intervention thoughts (paper III). Regression analyses indicated that the peritraumatic variables accounted for 40% of the variance of PTSD reactions. The peritraumatic emotional reactions of anger, guilt, and shame contributed the most to the subsequent PTSD. These findings are consistent with reports from studies of adults (Andrews, Brewin, Rose & Kirk, 2000). Peritraumatic dissociation (PD) has been shown to predict PTSD in adults (Holen, 1993; Johnson et al., 2001; Koopman et al., 1994; Marmar et al., 1999), while the concept of intervention thoughts

(INT) is less explored. The findings in the current study underscore the relevance of all these subjective features of traumatic experiences in the PTSD etiology. In our studies, objective features of single-incident traumas, mostly manmade, did not account for the levels of PTSD reactions, in contrast to findings from studies of PTSD after natural disasters (Pynoos et al., 1993).

The role of the objective and subjective peritraumatic features of the stressor in the development of PTSD are probably best captured by comprehensive assessments, and by studying children at various ages who have been exposed to a range of traumatic events. Published instruments assessing PTSD have so far focused mostly on the symptoms of PTSD. They have neither included assessments of the objective components of the stressor nor the immediate peritraumatic subjective responses. In this regard, the new scales used in this study may contribute to the field.

Current DSM-IV criteria of PTSD in children and adolescents have been based on research on adults (Carrion et al., 2002; Scheeringa et al., 1995, 2003). Our study indicates that additional adjustments may be warranted beyond the developmental modifications already introduced in DSM-IV.

The role of co-existing factors

Factors not directly related to the traumatic event may also play an important role in the development and maintenance of PTSD reactions. In this study, both pre-trauma factors (e.g., vulnerability, age) and post-trauma factors (e.g., secondary adversities) as well as associated psychiatric and psychosocial factors were explored in children (paper I, paper

IV). Age was positively associated with higher levels of PTSD reactions after alleged abuse (paper I). In contrast, children's reports of PTSD reactions five weeks after a traffic accident were negatively correlated to age (paper IV). The limited ability of young children in processing shame and guilt in relation to alleged sexual abuse may have protected them from distress. Some researchers have reported positive associations between age and levels of PTSD (Lonigan et al., 1991; Nader et al., 1990; Pynoos et al., 1987; Schwarz & Kowalski, 1991), while others found no significant relationships (Wolfe et al., 1989). A few studies have reported that younger children (2-6 years old) tend to have more symptoms (Dawes et al., 1989; Green et al., 1991). The diverse findings may be due to limited age-ranges and low numbers of participants. Moreover, the findings indicate that no linear relationship exists between age and distress, or that undiscovered mediating variables play a part.

Children with higher levels of posttraumatic stress reactions displayed more behavioral problems (paper I). The findings indicate that children may experience considerable difficulties in multiple areas of their lives after traumatic events. Problems seem to be most pronounced with regard to somatic complaints, anxiety, depression and social problems. Similar findings have been reported in studies of adolescents (Ackerman et al., 1998; Famularo et al., 1996; Goenjian et al., 2001; Lipschitz et al., 1999). In traumatized adolescents, Saigh et al. (2002) found that internalizing behavior problems were *secondary* to posttraumatic stress disorder. Hence, traumatic experiences may not only induce posttraumatic stress reactions, but psychosocial impairments as well.

After single incident traumas, posttraumatic stress reactions did not seem to reduce

children's overall levels of functioning as measured by Children's Global Assessment Scale (paper IV). Sack, Clarke, Kinney, Belestos & Seeley (1995) also found that adolescents with PTSD or with major depressive disorders fell within the "good adjustment" to "mild maladjustment" of GAF scores (Global Assessment of Functioning). These findings may indicate that internalizing symptoms, i.e., anxiety, depression and posttraumatic stress, do not reduce the levels of general functioning in children, or more likely, reduced functioning levels are not adequately assessed by measurement tools like CGAS.

4.2 The family perspective of child trauma

In the alleged sexual abuse case, the cascade of events involving parents was a source of significant distress (paper II). Parents rated "hearing about the sexual abuse", "testifying in court", "hearing the verdict" and "being exposed in media reports" as rather distressing events. Being interviewed by the police, however, was rated less distressing. The findings are consistent with reports from other studies of extrafamilial child sexual abuse (Kelley, 1990; Manion et al., 1998). In clinical reports, parents have described feelings of powerlessness and revictimization when involved in the criminal justice system. In similar situations, helplessness, anger and fear may overwhelm the parents and lead to distress reactions (Grosz, Kempe & Kelly, 2000; Haase, Kempe & Grosz, 1990; Reyman, 1990). Furthermore, parents of testifying children experienced higher levels of distress than parents of non-testifying ones (Burgess, Hartman, Kelley, Grant & Gray, 1990).

The cascade of events and the subsequent ratings of distress, describe the extended cascade stressor in the study of the parents (paper II). Elements of the cascade stressor

were significantly associated with the levels of PTSD symptoms four years after the abuse reports; abuse severity, testifying in court and police interviews. Co-existing factors; including externality (locus of control of behavior) and secondary life changes, showed even stronger associations to the levels of PTSD. The positive relationship between externality and the level of PTSD in parents suggests that relying on outside sources when coping with difficulties may limit recovery. In addition, secondary life changes in the wake of the local CSA controversy altered the families' lives in several ways. The changes included relocations, major changes in daily activities, changes in spare time activities, and change of friends. Grosz et al. (2000) reported similar family changes in a study of extrafamilial CSA. In other settings, the secondary aspects of traumatic events and their roles in the etiology of PTSD may vary (Goenjian et al., 1994). Hence, such factors may be useful to address in future PTSD studies.

Parental reactions may play a mediating role in the development of PTSD of children and adolescents, and also, they may impede the healing process (Green et al., 1991; McFarlane, Policansky & Irwin, 1987; Vila et al., 2001). Researchers have found, however, that childhood PTSD was significantly predicted by traumatic events, rather than by the functioning of the parents (Ahmad, Sofi, Sundelin-Wahlsten & von Knorring, 2000). The nature of the processes in families should be more adequately addressed in future research.

4.3 Validity of PTSD assessments in children

Children in this study reported significantly higher levels of post-traumatic stress reactions than observed by their parents (paper IV). The parent-child discrepancy were mainly determined by five items; repetitive mental images and sounds related to the trauma, feeling more emotionally alone, jumpy/nervous/startles easily, feelings of guilt, and avoidance of reminders. These reactions were not well observed by the parents, and prior to the assessment interviews, the children did not share them with others.

The parent-child discrepancy was more pronounced for the younger children. Adequate information about the levels of distress may be more difficult for parents to obtain in the lower age groups. Assessments of post-traumatic stress reactions based on parental reports, may underestimate the symptom intensity and the prevalence. Different authors have questioned the validity of parental reports of anxiety and PTSD symptoms in children (Achenbach, 1991; Sternberg et al., 1993; Weissman et al., 1987; Yule & Williams, 1990). Clinicians and researchers have often preferred parents' reports under the pretext of sparing the children after traumatic events. The potential bias represented by parental reports needs to be considered more carefully both in research and in clinical practice.

4.4 Limitations of the study

There are limitations to consider when interpreting the data from this study. The small numbers of participants restrict the generalizability of the findings, and calls for caution. In particular, non-significant findings may be due to type II errors (β), i.e., the sample is without the necessary power to detect true effects.

In paper I, II and IV, the participants are recruited after specific traumatic events. As in most naturalistic trauma studies, the group of participants are limited by the event, and the sample size is fixed. The obvious strength of such naturalistic studies, however, lies in the homogeneity of the stressor.

Paper I described the children's reactions after reporting sexual abuse and subsequent distressing events. In this case, no perpetrator confessed the abuse or was convicted. The child abuse is only described by the children, which calls for caution in interpreting the levels of exposure in the abusive events.

Retrospective data may be subject to recall bias, especially when the stressful events occurred several years prior to the study. In addition, the lack of standardized measures may have compromised aspects of the assessments.

This study was also faced with ethical issues that had implications for the study design (paper I). In the acute phase of the events, resources were directed towards clinical services for children and their families. Systematic collection of research data at that time was not considered ethical justifiable. Accordingly, retrospective data were collected about the acute phase. Parts of the data set, especially subjective descriptions of reactions, were not considered valid by peer reviewers and have remained unpublished. Approaching the

families four years after the alleged abuse and confronting them with earlier traumatic experiences, raised concerns about retraumatization. Accordingly, the Board of Research Ethics recommended the exclusion of children as informants about the traumatic events. Instead, parents reported their observations. This limitation weakened the child perspective of the study.

4.5 Conclusions

- 1) Peritraumatic emotional reactions, dissociation, intervention thoughts and physiological arousal were associated with subsequent PTSD reactions in adolescents (paper III). The findings indicate that subjective reactions during or immediately after traumatic events may play important roles in the development of PTSD.
- 2) For children, significant relationships were found between age and levels of PTSD reactions. Chronic PTSD was positively associated with age (paper I), while in the acute phase, PTSD reactions were negatively associated with age (paper IV).
- 3) In this study, children with chronic PTSD reactions displayed significant levels of behavior problems (paper I).
- 4) In the acute phase, posttraumatic stress reactions did not seem to influence the overall level of functioning of the children (paper IV).
- 5) Parental distress four years after alleged child sexual abuse was positively associated with the reported abuse severity, testifying in court, participating in

police interviews, having secondary life changes, and having high scores on externality (locus of control of behavior) (paper II). Externality and secondary life changes were significant predictors of parental distress.

- 6) Children (paper IV) reported significantly higher levels of post-traumatic stress reactions in the acute phase than observed by their parents. The findings indicate that parental reports may underestimate the prevalence of children's reactions.

4.6 Suggestions for future research

- Valid instruments assessing features of A1 and A2 (DSM-IV) should be implemented in research. More evidence-based knowledge about the possible roles of these features in the etiology of PTSD is warranted.
- Research programs studying the effects of traumatic events in children and adolescents, should also focus on long-term phenomena such as secondary adversities and behavior problems, as they may be crucial for the post-traumatic developments of young people, their long-term social adjustments in peer groups and their cognitive performance in school.
- The impact of child trauma on the family is gaining renewed interest in the area of childhood PTSD. Knowledge about such phenomena needs to be expanded to shed light on traumatic events beyond child abuse and somatic illness.
- Current criteria of PTSD in children and adolescents are based on research of adults. Further adjustments of the diagnostic criteria for children and adolescents seem

warranted. Future research should focus more on observing broader ranges of behaviors, thoughts and reactions in the aftermath of the events.

- Children's perspectives of trauma need to be assessed not only by the parents, but also by interviewing children and adolescents.
- Retrospective data regarding reactions in the acute phases after traumatic events may be subject to recall bias. Future research should aim for prospective designs.

5. References

- Abram, K. M., Teplin, L. A., Charles, D. R., Longworth, S. L., McClelland, G. M. & Dulcan, M. K. (2004). Posttraumatic stress disorder and trauma in youth in juvenile detention. *Archives of General Psychiatry*, *61*, 403-410.
- Achenbach, T. M. (1991). *Integrative Guide for the 1991 CBCL/4-18, YSR, and TRF Profiles*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Achenbach, T. M. & Rescorla, L.A. (2001). *Manual for the ASEBA School-Age Forms and Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, and Families.
- Ackerman, P. T., Newton, J. E. O., McPherson, W. B., Jones, J. G. & Dykman, R. A. (1998). Prevalence of post traumatic stress disorder and other psychiatric diagnoses in three groups of abused children. *Child Abuse and Neglect*, *22*, 759-774.
- Ajdukovic, M. (1998). Displaced adolescents in Croatia: Sources of stress and posttraumatic stress reactions. *Adolescence*, *33*, 209-217.
- Ahmad, A., Sofi, M. A., Sundelin-Wahlsten, V. & von Knorring, A. L. (2000). Posttraumatic stress disorder in children after military operation "Anfal" in Iraqi Kurdistan. *European Child and Adolescent Psychiatry*, *9*, 235-243.
- American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders (3rd ed.)*. Washington, DC: American Psychiatric Association.
- American Psychiatric Association (1987). *Diagnostic and statistical manual of mental disorders (3rd ed., rev.)*. Washington, DC: American Psychiatric Association.
- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders (4th ed.)*. Washington, DC: American Psychiatric Association.
- Andrews, B., Brewin, C. R., Rose, S. & Kirk, M. (2000). Predicting PTSD symptoms in victims of violent crime: the role of shame, anger, and childhood abuse. *Journal of Abnormal Psychology*, *109*, 69-73.
- Andrews, G. & Slade, T. (2002). The classification of anxiety disorders in ICD-10 and DSM-IV: A concordance analysis. *Psychopathology*, *35*, 100-106.
- Appelbaum, D. R. & Burns, G. L. (1991). Unexpected childhood death: Posttraumatic stress disorder in surviving siblings and parents. *Journal of Clinical Child Psychology*, *20*, 114-120.

- Bendixen, M., Muus, K. M. & Schei, B. (1994). The impact of child sexual abuse – a study of a random sample of Norwegian students. *Child Abuse and Neglect*, 18, 837-847.
- Benedek, E. (1985). Children and psychic trauma: a brief review of contemporary thinking. In S. Eth & R. S. Pynoos (Eds.), *Posttraumatic stress disorder in children* (pp. 3-16). Washington, DC: American Psychiatric Press.
- Black, D., Harris-Hendriks, J. & Kaplan, T. (1992). Father kills mother: post-traumatic stress disorder in the children. *Psychotherapy and psychosomatics*, 57, 152-157.
- Bird, H. R., Canino, G., Rubio-Stipec, M. & Ribera, J. C. (1987). Further measures of the psychometric properties of the Children's Global Assessment Scale. *Archives of General Psychiatry*, 44, 821-824.
- Bowlby, J. (1969). *Attachment and loss: attachment* (Vol. 1). New York: Basic Books.
- Bowlby, J. (1973). *Attachment and loss: separation anxiety and anger* (Vol. 2). New York: Basic Books.
- Bowlby, J. (1980). *Attachment and loss: loss, sadness, and depression* (Vol. 3). New York: Basic Books.
- Brewin, C. R., Andrews, B. & Rose, S. (2000). Fear, helplessness, and horror in posttraumatic stress disorder: Investigating DSM-IV Criterion A2 in victims of violent crime. *Journal of Traumatic Stress*, 13, 499-509.
- Briere, J., Johnson, K., Bissada, A., Damon, L., Crouch, J., Gil, E., Hanson, R. & Ernst, V. (2001). The Trauma Symptom Checklist for Young Children (TSCYC): reliability and association with abuse exposure in a multi-site study. *Child Abuse and Neglect*, 25, 1001-1014.
- Browne A, & Finkelhor, D. (1986). Impact of child sexual abuse: a review of the research. *Psychological Bulletin*, 99, 66-77.
- Bryant, B., Mayou, R., Wiggs, L., Ehlers, A. & Stores, G. (2004). Psychological consequences of road traffic accidents for children and their mothers. *Psychological Medicine*, 34, 335-346.
- Burgess, A. W., Hartman, C. R., Kelley, S. J., Grant, C. A. & Gray, E. B. (1990). Parental response to child sexual abuse trials involving day care settings. *Journal of Traumatic Stress*, 3, 395-405.

- Carrion, V. G., Weems, C. F., Ray, R. & Reiss, A. L. (2002). Toward an empirical definition of pediatric PTSD: The phenomenology of PTSD symptoms in youth. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 166-173.
- Connolly, D., McClowry, S., Hayman, L., Mahony, L. & Artman, M. (2004). Posttraumatic stress disorder in children after cardiac surgery. *The Journal of Pediatrics*, 144, 480-484.
- Conte, J. R. & Schuerman, J. R. (1987). Factors associated with an increased impact of child sexual abuse. *Child Abuse and Neglect*, 11, 201-211.
- Costello, E. J., Angold, A., March, J. & Fairbank, J. A. (1998). Life events and post-traumatic stress: the development of a new measure for children and adolescents. *Psychological Medicine*, 28, 1275-1288.
- Craig, A. R., Franklin, J. A. & Andrews, G. (1984). A scale to measure locus of control of behaviour. *British Journal of Medical Psychology*, 57, 173-80.
- Davies, M. G. (1995). Parental distress and ability to cope following disclosure of extra-familial sexual abuse. *Child Abuse and Neglect*, 19, 399-408.
- Dawes, A., Tredoux, C. & Feinstein, A. (1989). Political violence in South-Africa: Some effects on children of the violent destruction of their community. *International Journal of Mental Health*, 18, 16-43.
- Deblinger, E., McLeer, S. V., Atkins, M. S., Ralphe, D. & Foa, E. (1989). Posttraumatic stress in sexually abused, physically abused, and nonabused children. *Child Abuse and Neglect*, 13, 403-408.
- de Vries, A. P. J., Kassam-Adams, N., Cnaan, A., Sherman-Slate, E., Gallagher, P.R. & Winston, F. K. (1999). Looking beyond the physical injury: Posttraumatic stress disorder in children and parents after pediatric traffic injury. *Pediatrics*, 104, 1293-1299.
- Dube, S. R., Felitti, V. J., Dong, M., Giles, W. H. & Anda, R. F. (2003). The impact of adverse childhood experiences in health problems: evidence from four birth cohorts dating back to 1900. *Preventive Medicine*, 37, 268-277.
- Earls, F., Smith, E., Reich, W. & Jung, K. G. (1988). Investigating psychopathological consequences of a disaster in children: A pilot study incorporating a structured diagnostic interview. *Journal of the American Academy of Child and Adolescent Psychiatry*, 27, 90-95.

- Ehlers, A., Mayou, R. A. & Bryant, B. (2003). Cognitive predictors of posttraumatic stress disorder in children: results of a prospective longitudinal study. *Behaviour Research and Therapy*, 41, 1-10.
- Eid, J., Thayer, J. F. & Johnsen, B. H. (1999). Measuring post-traumatic stress: A psychometric evaluation of symptom- and coping questionnaires based on a Norwegian sample. *Scandinavian Journal of Psychology*, 40, 101-108.
- Ellis, A., Stores, G. & Mayou, R. (1998). Psychological consequences of road traffic accidents in children. *European Child and Adolescent Psychiatry*, 7, 761-768.
- Eth, S. & Pynoos, R. S. (1985). *Posttraumatic stress disorder in children*. Washington, DC: American Psychiatric Press.
- Famularo, R., Fenton, T., Kinscherff, R. & Augustyn, M. (1996). Psychiatric comorbidity in childhood post traumatic stress disorder. *Child Abuse and Neglect*, 20, 953-961.
- Fein, J. A., Kassam-Adams, N., Vu, T. & Datner, E. M. (2001). Emergency department evaluation of acute stress disorder symptoms in violently injured youths. *Annals of Emergency Medicine*, 38, 391-396.
- Finkelhor, D., Williams, L. M. & Burns, N. (1988). *Nursery crimes: sexual abuse in day care*. Newbury Park, CA: Sage.
- Fletcher, K. E. (1996). Childhood posttraumatic stress disorder. In E. J. Mach & R. Barkley (Eds.), *Child psychopathology* (pp. 242-276). New York: Guilford Press.
- Foy, D. W., Madvig, B. T., Pynoos, R. S. & Camilleri, A. J. (1996). Etiological factors in the development of posttraumatic stress disorder in children and adolescents. *Journal of School Psychology*, 34, 133-145.
- Freud, A. & Burlingham, D. T. (1943). *War and children*. London: Medical war books.
- Goenjian, A. K., Molina, L., Steinberg, A. M., Fairbanks, L. A., Alvarez, M. L., Goenjian, H. A. & Pynoos, R. S. (2001). Posttraumatic stress and depressive reactions among Nicaraguan adolescents after hurricane Mitch. *American Journal of Psychiatry*, 158, 788-794.
- Goenjian, A. K., Najarian, L. M., Pynoos, R. S., Steinberg, A. M., Manoukian, G., Tavosian, A. & Fairbanks, L. A. (1994). Posttraumatic stress disorder in elderly and younger adults after the 1988 earthquake in Armenia. *American Journal of Psychiatry*, 151, 895-901.

- Goldberg, D. & Williams, P. (1988). *A user's guide to the general health questionnaire*. Windsor, UK: NFER-Nelson.
- Goodwin, J. (1988). Posttraumatic symptoms in abused children. *Journal of Traumatic Stress, 1*, 475-488.
- Green, B. L., Korol, M., Grace, M. C., Vary, M. J., Leonard, A. C., Gleser, G. C. & Smitson-Cohen, S. (1991). Children and disaster: age, gender, and parental effects on PTSD symptoms. *Journal of the American Academy of Child and Adolescent Psychiatry, 30*, 945-951.
- Grosz, C. A., Kempe, R. S. & Kelly, M. (2000). Extrafamilial sexual abuse: Treatment for child victims and their families. *Child Abuse and Neglect, 24*, 9-23.
- Haase, C. C., Kempe, R. S. & Grosz, C. A. (1990). Non-familial sexual abuse: Working with children and their families. In R. K. Oates (Ed.), *Understanding and managing child sexual abuse* (pp. 178-201). Philadelphia, PA: W.B. Saunders/Baillière Tindall.
- Hardin, S. B., Weinrich, M., Weinrich, S., Hardin, T. L. & Garrison, C. (1994). Psychological distress of adolescents exposed to Hurricane Hugo. *Journal of Traumatic Stress, 7*, 427-440.
- Handford, H. A., Mayes, S. D., Mattison, R. E., Humphrey, F. J., Bagnatio, S., Bixler, E. O. & Kales, J. D. (1986). Child and parents reaction to the Three Mile Island nuclear accident. *Journal of the American Academy of Child and Adolescent Psychiatry, 25*, 346-356.
- Holen, A. (1993). The North Sea oil rig disaster. In J. P. Wilson & B. Raphael (Eds.), *International handbook of traumatic stress syndromes* (pp. 405-525). New York: Plenum.
- Horowitz, K., Weine, S. & Jekel, J. (1995). PTSD symptoms in urban adolescent girls: Compounded community trauma. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 1353-1361.
- Horowitz, M., Wilner, N. & Alvarez, W. (1979). Impact of event scale: A measure of subjective stress. *Psychosomatic Medicine, 41*, 209-218.
- Horowitz, M. J. (1982). Stress response syndromes and their treatment. In L. Goldberger & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (pp. 711-731). New York: Free Press.

- Johnson, D. M., Pike, J. L. & Chard, K. M (2001). Factors predicting PTSD, depression, and dissociative severity in female treatment-seeking childhood sexual abuse survivors. *Child Abuse and Neglect*, 25, 179-198.
- Jones, R. T., Ribbe, D. P., Cunningham, P. B., Weddle, J. D. & Langley, A. K. (2002). Psychological impact of fire disaster on children and their parents. *Behavior Modification*, 26, 163-86.
- Kazak, A. E., Alderfer, M. A., Streisand, R., Simms, S., Rourke, M. T., Barakat, L. P., Gallagher, P. & Cnaan, A.(2004). Treatment of posttraumatic stress symptoms in adolescent survivors of childhood cancer and their families: a randomized clinical trial. *Journal of Family Psychology*, 18, 493-504.
- Kelley, S. J. (1990). Parental stress response to sexual abuse and ritualistic abuse of children in day-care centers. *Nursing Research*, 39, 25-29.
- Kendall-Tackett, K. A., Williams, L. M. & Finkelhor, D. (1993). Impact of sexual abuse on children: A review and synthesis of recent empirical studies. *Psychological Bulletin*, 113, 164-180.
- Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S. & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: results from the National Survey of Adolescents. *Journal of Consulting and Clinical Psychology*, 71, 692-700.
- Kisiel, C. L. & Lyons, J. S. (2001). Dissociation as a mediator of psychopathology among sexually abused children and adolescents. *American Journal of Psychiatry*, 158, 1034-1039.
- Koopman, C., Classen, C. & Spiegel, D. (1994). Predictors of posttraumatic stress symptoms among survivors of the Oakland/Berkeley, Calif., Firestorm. *American Journal of Psychiatry*, 151, 888-894.
- Langmeier, J. & Matejcek, Z. (1973). *Psychological deprivation in childhood*. New York: Halsted Press.
- Lansford J. E., Dodge, K. A., Pettit, G. S., Bates, J. E., Crozier, J. & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Archives of Pediatric Adolescent Medicine*, 156, 824-830.
- Leventhal, J. M. (1990). Epidemiology of child sexual abuse. In R. K. Oates (Ed.), *Understanding and managing child sexual abuse* (pp. 18-41). Philadelphia, PA : W.B. Saunders/Baillière Tindall.

- Lipschitz, D. S., Winegar, R. K., Hartnick, E., Foote, B. & Southwick, S. M. (1999). Posttraumatic stress disorder in hospitalized adolescents: Psychiatric comorbidity and clinical correlates. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 385-392.
- López-Ibor, J. J. (2002). The classification of stress-related disorders in ICD-10 and DSM-IV. *Psychopathology*, 35, 107-111.
- Lonigan, C. J., Shannon, M. P., Finch, A. J., Daugherty, T. K. & Taylor, C. M. (1991). Children's reactions to natural disaster: Symptom severity and degree of exposure. *Advances in Behaviour Research and Therapy*, 13, 135-154.
- Macksoud, M. S. & Aber, J. L. (1996). The war experiences and psychosocial development of children in Lebanon. *Child Development*, 67, 70-88.
- Malmquist, C. P. (1986). Children who witness parental murder: Posttraumatic aspects. *Journal of the American Academy of Child and Adolescent Psychiatry*, 25, 320-325.
- Malt, U. F. (1989). The validity of the general health questionnaire in a sample of accidentally injured adults. *Acta Psychiatrica Scandinavia Supplements*, 80, 103-112.
- Manion, I., Firestone, P., Cloutier, P., Ligezinska, M., McIntyre, J. & Ensom, R. (1998). Child extrafamilial sexual abuse: predicting parent and child functioning. *Child Abuse and Neglect*, 22, 1285-1304.
- Manion, I. G., McIntyre, J., Firestone, P., Ligezinska, M., Ensom, R. & Wells, G. (1996). Secondary traumatization in parents following the disclosure of extrafamilial child sexual abuse: Initial effects. *Child Abuse and Neglect*, 20, 1095-1109.
- March, J. S. (1993). What constitutes a stressor? The "Criterion A" issue. In J. R. T. Davidson & E. B. Foa (Eds.), *Posttraumatic stress disorder-DSM-IV and beyond* (pp. 57-74). Washington, DC: American Psychiatric Press.
- March, J. S. (1999). Assessment of pediatric posttraumatic stress disorder. In P. A. Saigh & J. D. Bremner (Eds.), *Posttraumatic stress disorder. A comprehensive text* (pp. 199-219). Needham Heights, MA: Allyn and Bacon.
- Marmar, C. R., Weiss, D. S., Metzler, T. J., Delucchi, K., Best, S. R. & Wentworth, K. A. (1999). Longitudinal course and predictors of continuing distress following critical incident exposure in emergency services personnel. *Journal of Nervous and Mental Disease*, 187, 15-22.

- Marmar, C. R., Weiss, D. S., Metzler, T. J., Ronfeldt, H. M. & Foreman, C. (1996). Stress responses of emergency service personell to the Loma Priets earthquake Interstate 880 freeway collapse and control traumatic incidents. *Journal of Traumatic Stress, 9*, 63-85.
- Marmar, C. R., Weiss, D. S., Schlenger, W. E., Fairbank, J. A., Jordan, K., Kulka, R. A. & Hough, R. L. (1994). Peritraumatic dissociation and posttraumatic stress in male Vietnam theater veterans. *American Journal of Psychiatry, 151*, 902-907.
- McFarlane, A. C., Policansky, S. K. & Irwin, C. (1987). A longitudinal study of the psychological morbidity in children due to a natural disaster. *Psychological Medicine, 17*, 727-738.
- McLeer, S. V., Deblinger, E., Atkins, M. S., Foa, E. B. & Ralphe, D. L. (1988). Post-traumatic stress disorder in sexually abused children. *Journal of the American Academy of Child and Adolescent Psychiatry, 27*, 650-654.
- McLeer, S. V., Deblinger, E., Henry, D. & Orvaschel, H. (1992). Sexually abused children at high risk for post-traumatic stress disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 31*, 875-879.
- Mollica, R. F., Poole, C., Son, L., Murray, C. C. & Tor, S. (1997). Effects of war trauma in Cambodian refugee adolescents' functional health and mental health status. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 1098-1106.
- Nader, K. O. (2004). Assessing traumatic experiences in children and adolescents: Self-reports of DSM PTSD Criteria B-D symptoms. In J. P. Wilson & T. M. Keane (Eds.), *Assessing Psychological Trauma and PTSD* (2nd edition, pp. 513-538). New York: Guilford Press.
- Nader, K., Blake, D., Kriegler, J. & Pynoos, R. (1994). *Clinician Administered PTSD Scale for Children (CAPS-C), Current and lifetime diagnosis version, and instruction manual*. Los Angeles: UCLA Neuropsychiatric Institute and National Center for PTSD.
- Nader, K. O., Pynoos, R. S., Fairbanks, L. A., Al-Ajeel, M. & Al-Asfour, A. (1993). A preliminary study of PTSD and grief among the children of Kuwait following the Gulf crisis. *British Journal of Clinical Psychology, 32*, 407-416.
- Nader, K., Pynoos, R., Fairbanks, L. & Frederick, C. (1990). Children's PTSD reactions one year after a sniper attack at their school. *American Journal of Psychiatry, 147*, 1526-1530.

- Nixon, R. D. V., Resick, P. A. & Griffin, M. G. (2002). Panic following trauma: the etiology of acute posttraumatic arousal. *Anxiety Disorders, 18*, 193-210.
- Oates, K. R., O'Toole, B. I., Lynch, D. L., Stern, A. & Cooney, G. (1994). Stability and change in outcomes for sexually abused children. *Journal of the American Academy of Child and Adolescent Psychiatry, 33*, 945-953.
- Pelcovitz, D., Libov, B. G., Mandel, F., Kaplan, S., Weinblatt, M. & Septimus, A. (1998). Posttraumatic stress disorder and family functioning in adolescent cancer. *Journal of Traumatic Stress, 11*, 205-221.
- Pfefferbaum, B., Nixon, S. J., Krug, R. S., Tivis, R. D., Moore, V. L., Brown, J. M., Pynoos, R. S., Foy, D. & Gurwitch, R. H. (1999). Clinical needs assessment of middle and high school students following the 1995 Oklahoma city bombing. *American Journal of Psychiatry, 156*, 1069-1074.
- Pynoos, R. S., Frederick, C., Nader, K., Arroyo, W., Steinberg, A., Eth, S., Nunez, F. & Fairbanks, L. (1987). Life threat and posttraumatic stress in school-age children. *Archives of General Psychiatry, 44*, 1057-1063.
- Pynoos, R. S., Goenjian, A., Tashjian, M., Karakashian, M., Manjikian, R. & Manoukian, G. (1993). Post-traumatic stress reactions in children after the 1988 Armenian earthquake. *British Journal of Psychiatry, 163*, 239-247.
- Pynoos, R. S. & Nader, K. (1988). Children who witness the sexual assaults of their mothers. *Journal of the American Academy of Child and Adolescent Psychiatry, 27*, 567-572.
- Pynoos, R. S. & Nader, K. (1989). Children's memory and proximity to violence. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*, 235-241.
- Putnam, F. W. (1985). Dissociation as a response to extreme trauma. In R. P. Kluft (Ed.), *Childhood antecedents of multiple personality. (pp. 65-97)*. Washington DC: American Psychiatric Press.
- Putnam, F. W. (1993). Dissociative disorders in children: Behavioral profiles and problems. *Child Abuse and Neglect, 17*, 39-45.
- Reyman, M. B. (1990). Family responses to extrafamilial child sexual abuse: an overview and an experiential perspective. *Issues in Comprehensive Pediatric Nursing, 13*, 203-220.
- Richters, J. E. & Saltzman, W. R. (1989). *Survey of children's exposure to community violence*. Bethesda, MD: National Institute of Mental Health.

- Rodriguez, N. (2004). *The validation of the Youth Peritraumatic Reactions Questionnaire*. Paper presented at the International Research Conference of the Family Research Laboratory, Portsmouth, NH.
- Rodriguez, N., Ryan, S. W., Rowan, A. B. & Foy, D. W. (1996). Posttraumatic stress disorder in a clinical sample of adult survivors of childhood sexual abuse. *Child Abuse and Neglect, 20*, 943-952.
- Rodriguez, N., Steinberg, A. M., Saltzman, W. S. & Pynoos, R. S. (2001). PTSD Index: Psychometric analysis of the Adolescent Version. In N. Rodriguez (Chair), *Youth PTSD assessment: Psychometric investigation of PTSD self-report instruments*. Symposium conducted at the Annual Meeting of the International Society for Traumatic Stress Studies, New Orleans, LA.
- Ruggiero, K. J., McLeer, S. V. & Dixon, J. F. (2000). Sexual abuse characteristics associated with survivor psychopathology. *Child Abuse and Neglect, 24*, 951-964.
- Russell, D. E. (1983). The incidence and prevalence of intrafamilial and extrafamilial sexual abuse of female children. *Child Abuse and Neglect, 7*, 133-146.
- Sack, W. H., Clarke, G. N., Kinney, R., Belestos, G. & Seeley, J. (1995). The Khmer Adolescent Project II: Functional capacities in two generations of Cambodian refugees. *Journal of Nervous and Mental Disease, 183*, 177-81.
- Saigh, P. A. (1989). The validity of the DSM-III posttraumatic stress disorder classification as applied to children. *Journal of Abnormal Psychology, 98*, 189-192.
- Saigh, P. A., Yasik, A. E., Oberfield, R. A., Halamandaris, P. V. & McHugh, M. (2002). An analyses of the internalizing and externalizing behaviors of traumatized urban youth with an without PTSD. *Journal of Abnormal Psychology, 111*, 462-470.
- Saltzman, W. R., Layne, C. M. & Steinberg, A. M. (1998) *Community Violence Exposure Survey (CVES)*, unpublished psychological test, Los Angeles: University of California.
- Schechter, M. D. & Roberge, L. (1976). Sexual exploitation. In R. E. Helfer & C. H. Kempe (Eds.), *Child abuse and neglect: The family and the community* (pp. 127-142). Cambridge, MA: Ballinger.

- Scheeringa, M. S., Zeanah, C. H., Drell, M. J. & Larrieu, J. A. (1995). Two approaches to the diagnosis of posttraumatic stress disorder in infancy and early childhood. *Journal of the American Academy of Child and Adolescent Psychiatry*, 43, 191-200.
- Scheeringa, M. S., Zeanah, C. H., Myers, L. & Putnam, F. W. (2003). New findings on alternative criteria for PTSD in preschool children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 42, 561-70.
- Schwartz, E. D. & Kowalski, J. M. (1991). Malignant memories: PTSD in children and adults after a school shooting. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 936-944.
- Shaffer, D., Gould, M. S., Brasic, J., Ambrosini, P., Fisher, P., Bird, H. & Aluwahlia, S. (1983). A Children's Global Assessment Scale (CGAS). *Archives of General Psychiatry*, 40, 1228-1231.
- Shalev, D. Y., Freedman, S., Peri, T., Brandes, D., Sahar, T., Orr, S. P. & Pitman, R. K. (1998). Prospective study of posttraumatic stress disorder and depression following trauma. *American Journal of Psychiatry*, 155, 630-637.
- Socialstyrelsen (1999). *När det otänkbara händer. Om sexuella övergrepp på ett daghem i Sverige i 1997. SoS-rapport 1999:3*. Stockholm: Socialstyrelsen.
- Spiegel, D. (1984). Multiple personality disorder as a post-traumatic stress disorder. *Psychiatric Clinics of North America*, 7, 101-110.
- Spitz, R. A. (1946). Hospitalism: a follow-up report. *The Psychoanalytic Study of the Child*, 2, 113-117.
- Stallard, P., Salter, E. & Velleman, R. (2004). Posttraumatic stress disorder following road traffic accidents. A second prospective study. *European Child & Adolescent Psychiatry*, 13, 172-178.
- Stallard, P., Velleman, R. & Baldwin, S. (1998). Prospective study of post-traumatic stress disorder in children involved in road traffic accidents. *British Medical Journal*, 317, 1619-1623.
- Steinberg, A. M., Brymer, M., Decker, K. & Pynoos, R. S. (2004). The UCLA PTSD Reaction Index. *Current Psychiatry Reports*, 6, 96-100.
- Sternberg, K. J., Lamb, M. E., Greenbaum, C., Cicchetti, D., Dawud, S., Cortes, R. M. & Krispin, O. & Lorey, K. (1993). Effects of domestic violence on children's behavior problems and depression. *Developmental Psychology*, 29, 44-52.

- Stuber, M. L., Nader, K., Yasuda, P., Pynoos, R. S. & Cohen, S. (1991). Stress responses after pediatric bone marrow transplantation: preliminary results of a prospective longitudinal study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 952-957.
- Swanston, H. Y., Plunkett, A. M., O'Toole, B. I., Shrimpton, S., Parkinson, P. N. & Oates, R. K. (2003). Nine years after child sexual abuse. *Child Abuse and Neglect*, 27, 967-984.
- Tichenor, V., Marmar, C. R., Weiss, D. S., Metzler, T. J. & Ronfeldt, H. M. (1996). The relationship of peritraumatic dissociation and posttraumatic stress: Findings in female vietnam theater veterans. *Journal of Consulting and Clinical Psychology*, 64, 1054-1059.
- Terr, L. C. (1981). Psychic trauma in children: observations following the Chowchilla school-bus kidnapping. *American Journal of Psychiatry*, 138, 14-19.
- Terr, L. C. (1983). Chowchilla revisited: the effects of psychic trauma four years after a school-bus kidnapping. *American Journal of Psychiatry*, 140, 1543-1550.
- Timmons-Mitchell, J., Chandler-Holtz, D. & Semple, W. E. (1996). Post-traumatic stress symptoms in mothers following children's reports of sexual abuse: An exploratory study. *American Journal of Orthopsychiatry*, 66, 463-467.
- Vila, G., Witkowski, P., Tondini, M. C., Perez-Diaz, F., Mouren-Simeoni, M. C. & Jouvent, R. (2001). A study of posttraumatic disorders in children who experienced an industrial disaster in the Briey region. *European Child and Adolescent Psychiatry*, 10, 10-18.
- Waterman, J., Kelly, R. J., Oliveri, M. K. & McCord J. (1993). *Behind the playground walls: Sexual abuse in preschools*. New York: Guilford Publications.
- Weissman, M. M., Wickramaratne, P., Warner, V., John, K., Prusoff, B. A., Merikangas, K. R. & Gammon, D. (1987). Assessing psychiatric disorders in children. *Archives of General Psychiatry*, 44, 747-753.
- Wolfe, V. V., Gentile, C. & Wolfe, D. A. (1989). The impact of sexual abuse on children: A PTSD formulation. *Behavior Therapy*, 20, 215-228.
- World Health Organization (1992a). *International classification of mental and behavioral disorders. Clinical descriptions and diagnostic guidelines*. Geneva: World Health Organization.

- World Health Organization (1992b). *International classification of mental and behavioral disorders. Diagnostic criteria for research*. Geneva: World Health Organization.
- Winje, D. & Ulvik, A. (1998). Long-term outcome of trauma in children: The psychological consequences of a bus accident. *Journal of Child Psychology and Psychiatry*; 39, 635-642.
- Yule, W. (1992). Post-traumatic stress disorder in child survivors of shipping disasters: the sinking of the 'Jupiter'. *Psychotherapy and psychosomatics*, 57, 200-205.
- Yule, W. & Williams, R. M. (1990). Post-traumatic stress reactions in children. *Journal of Traumatic Stress*, 3, 279-295.

Appendix 1

Definitions of child sexual abuse

In this study, the terms “child sexual abuse” or, CSA, and “alleged child sexual abuse” are used. Firstly, common definitions of the terms are outlined. Secondly, definitions of the terms are described as applied in the current study.

1) Commonly used definitions

a. Child sexual abuse

The general definition

“The sexual exploitation of children is the involvement of dependent, developmentally immature children and adolescents in activities that they do not fully comprehend, (to which they) are unable to give informed consent, and that violate the social taboos of family roles” (Schechter & Roberge, 1976).

Definitions in research

To study the phenomena, researchers have to operationalise the terms used in the general definition. Definitions of sexual abuse often include:

1. Touching of the breasts or genitalia
2. Attempted or actual oral, anal, or vaginal penetration.

Less commonly, researchers include sexual acts that have *not* involved contact (sexual exhibitionism, pornography). Researchers have also tried to exclude sexual play between

children from their definitions. A common approach has been to require an age difference of at least five years between the individuals involved (Leventhal, 1990).

The relationship to the perpetrator

In one of the earliest epidemiological studies of sexual abuse in children, Russell (1983) used the following definitions:

Extrafamilial child sexual abuse was defined as one or more unwanted sexual experiences with persons unrelated by blood or marriage, ranging from petting (touching of breasts, or genitals, or attempts at such touching) to rape, before the victim turned 14 years, and completed or attempted forcible rape experiences from the ages of 14 to 17 years (inclusive).

Intrafamilial child sexual abuse was defined as any kind of exploitive sexual contact that occurred between relatives, no matter how distant the relationship, before the victim turned 18 years old.

In later studies, researchers have applied different upper age limits for victims of child sexual abuse, from 14 years up to 18 years of age (Leventhal, 1990).

Severity of child sexual abuse

Russell (1983) defined three severity levels:

1. *Very serious sexual abuse*
Completed and attempted vaginal, oral, anal intercourse, cunnilingus, analingus, forced and unforced.

2. *Serious sexual abuse*

Completed and attempted genital fondling, simulated intercourse, digital penetration, forced and unforced.

3. *Least serious sexual abuse*

Completed and attempted acts of intentional sexual touching of clothed breasts or genitals forced and unforced.

For intrafamilial child sexual abuse, the following was added: Intentional sexual touching of buttocks, thigh, leg or other body part, kissing, forced and unforced.

The term forced includes physical force, threat of physical force, or inability to consent because of being unconscious, drugged, asleep, or in some other way being totally helpless.

b. Alleged child sexual abuse

Child physical and sexual abuse occurs in secret, and thereby the discovery, disclosure and validation of abuse are problematic issues. The term “alleged” is often used when the sexual abuse reports cannot be substantiated.

Accordingly, most researchers will require that the sexual abuse allegation have been “substantiated” when using the term “child sexual abuse” in their work. Some researchers base the notion of substantiation on local investigators in child protection services and the police (Finkelhor et al., 1988), and some on confessions from the perpetrator or convictions. “Substantiation” of child sexual abuse remains a controversy, and to date there is no concensus in the issue.

2) **Definitions applied in this study**

Most of the children included in sample 1, reported sexual and physical abuse conducted by adults. In interviews, parents were asked about the most severe abuse experience of their children, and the following categorization was applied:

-no sexual abuse: no reports of sexual abuse

-less intrusive sexual abuse: child instructed to expose genitals, fondling child's genitals, or oral-genital contact

-highly intrusive sexual abuse: digital, anal or vaginal penetration and other acts involving semen

The accused never confessed and was not found guilty by the court. The child abuse is only described by the children, which calls for caution in interpreting the levels of exposure to abusive acts based on the reports. Accordingly, the term "alleged sexual abuse" was applied in this study (paper I and II).

For parents, the term "hearing about the sexual abuse" was defined as the first element of the cascade stressor (paper II). Parents were asked to rate to what extent they believed their children's reports at the time of disclosure (T₁) and at follow-up, four years later (T₂). A high percentage of the parents believed the abuse reports to be true (70.5%), and their beliefs remained stable over time (80,5% at T₂).

Errata

Paper IV

Page 339

Abstract, line 8

For: 4 weeks

Read: Five weeks

Paper I

**Posttraumatic stress reactions and behavior problems
in children four years after alleged sexual abuse in daycare**

Grete Dyb ¹

Are Holen ¹

¹ Department of Neuromedicine, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway;

Address all correspondence and reprint requests to: Grete Dyb, M.D., National Center of Studies on Violence and Traumatic Stress, Kirkeveien 166, Bygning Z, 0407 Oslo, Norway

phone: +47 22 59 55 00 fax: +47 22 59 55 01 email: grete.dyb@nkvtv.unirand.no

Keywords: Posttraumatic Stress Disorder, PTSD, child molestation

Support: This study was supported by a fellowship from the Faculty of Medicine, Norwegian University of Science and Technology, the U.S.-Norway Fulbright Foundation for Educational Exchange and The Unger Vetlesen Medical Fund.

**Posttraumatic stress reactions and behavior problems
in children four years after alleged sexual abuse in daycare**

Clinical implications

The described cascade of events endorsed by the children in this study demonstrates many dilemmas and difficulties that families may be faced with in the aftermath of CSA reports. The follow-up report showing considerable levels of posttraumatic distress and behavior problems in the children calls for professional attention. A clinical service that includes assessments of the child and the situation of the family seems needed, not only in the acute phases but also on a long-term basis.

Abstract

Objective: This report describes the cascade of stressful events experienced by children in a case of alleged sexual abuse at a day-care program. The study evaluated children's posttraumatic stress reactions and behavior problems four years after the alleged abuse and explored factors associated to the distress.

Methods: Parents of 32 children were interviewed about demographic data, psychosocial impairment prior to the alleged abuse, family life events, the child's reports of sexual and physical abuse and threats, exposure to forensic interviews, medical examination, court experiences and media exposure. Children's current distress reactions and behavior problems were assessed by standardized measures.

Results: Half of the children displayed high levels of posttraumatic stress reactions at follow-up. Older children showed significantly more signs of posttraumatic stress. Anxiety, depression, somatic complaints and social problems correlated significantly with posttraumatic stress, and the relationship was unrelated to the children's age.

Conclusion: This study demonstrated that four years after the alleged sexual abuse in day care, half of the children showed significant levels of posttraumatic stress reactions and behavior problems, indicating a need of long-term services in similar situations.

Introduction

A range of different traumatic events are known to constitute posttraumatic stress reactions in children and adolescents, including natural disasters (Green et al., 1991), exposure to war and violence (Mollica, Poole, Son, Murrey, & Tor, 1997; Pynoos et al, 1987; Terr, 1991), chronic illness (Stuber et al., 1997), witnessing of traumatic events (Malmquist, 1986) and experiencing childhood sexual and physical abuse (Deblinger, McLeer, Atkins, Ralphe, & Foa, 1989). Highest prevalence rates for PTSD in children and adolescents have been reported from samples of multitraumatized inpatients, most of them sexually and physically abused. One third of the adolescents had PTSD (Lipschitz , Winegar, Hartnick, Foote, & Southwick,1999; Ackerman, Newton, McPherson, Jones & Dykman,1998), about seven times higher than in the general population of adolescents in the US (Kilpatrick et al, 2003).

During the last decades several researchers have reported cases of child sexual abuse in institutions like day care programs (Faller, 1988; Kelley, Brant, & Waterman, 1993; Finkelhor, Williams, & Burns, 1988). The degree of professional and media attention varied, as did the length and complexity of subsequent legal proceedings (Waterman, Kelly, Oliveri, & McCord, 1993). A number of events often occurred in the aftermath of the children's reports of abuse, such as police questioning, medical investigation, psychological assessments, court proceedings and media attention. Many families relocated to avoid further media attention, and controversies in the community. Such cascades of events may constitute additional and severe distress in the life of the children and their families (Finkelhor, Williams, & Burns, 1988; Dyb, Holen, Steinberg, Rodriguez, & Pynoos, 2003).

Stress reactions may fluctuate in severity over time, and, they may persist for months, or even years (Nader, Pynoos, Fairbanks, & Frederick, 1990; Goenjian et al., 1995; Winje & Ulvik, 1998). Severe posttraumatic disturbances in children four years after a school bus kidnapping have been described by Terr (1983), and high levels of depression, anxiety and behaviour problems was reported in a study of sexually abused young people nine years after submission (Swanston et al., 2003).

Children and adolescents suffering from PTSD may display additional psychiatric or psychosocial problems. As in adults, studies have shown that PTSD in children and adolescents is a highly comorbid condition, especially associated to anxiety and mood disorders (Famularo, Fenton, Kinscherff & Augustyn, 1996; Ackerman et al., 1998; Lipschitz et al., 1999; Goenjian et al., 2001). Also, in a study by Saigh, Yasik, Oberfield, Halamandaris & McHugh (2002), traumatised youth with PTSD displayed significantly higher levels of behavior problems than controls and traumatised youth with no PTSD diagnoses.

This study had three objectives: to identify stressful events as well as related secondary life changes in children who had been involved in a case of alleged sexual abuse; to determine children's levels of posttraumatic stress and behavior problems four years after the alleged abuse; and to explore factors that may predict the subsequent distress.

The event: Background information

In March of 1992, in a rural community of about 5,000 inhabitants in Norway, a 5-year-old girl told her family that she had been sexually abused by a male assistant at her day care center. Subsequently, this information was passed on to other parents. Shortly after, many children disclosed similar incidents; some reported serious sexual

and physical abuse. The police initiated an extensive investigation that included medical and psychological assessments as well as forensic interviews. The alleged events created a controversy that soon polarised the small community. National media networks, including radio, TV, and newspapers devoted extensive coverage to the alleged incidents. Many parents were met with disbelief about the authenticity of the abuse. Most parents remained silent, and tried to protect their children from further attention and involvements. Some found the situation so intolerable, that they almost completely withdrew from social life. Because of widespread emotional distress within the families, a therapy program was developed and implemented by the Department of Child and Adolescent Psychiatry (Dyb, 1995).

In November 1993, a jury in court heard the case. During the proceedings, videos were shown of the children's interviews. As a result, a day care center assistant was accused of having sexually abused ten children. On January 31, 1994, the jury ruled that the assistant was not guilty.

Method

Participants

After the alleged CSA, 40 families were referred to the treatment program. Four years after the reported sexual abuse, they were invited to participate in the present study. Twenty-five families (62.5%) agreed to participate, five (12.5%) families declined and 10 (25 %) did not respond to the invitation. The 25 participating families represented 32 children (24 girls and 8 boys); 14 were siblings. The children's mean age at the time of follow-up was 8.8 years (range 6- 12). Non-participating families (N=15) represented 15 children, (12 girls and 3 boys). These children's mean age at follow-up was 9.3 years (range 6-12). Demographic data are presented in Table 1.

Procedures

Four years after the reported sexual abuse, the parents received an invitation by mail to participate as informants in the study. In the following months, the parents were interviewed face-to-face by the first author, and completed a battery of questionnaires. When both parents participated, they were interviewed together. All parents gave written informed consent. The Board of Research Ethics in Health region IV of Norway approved the study.

Measurements

Face- to- face parental interview

Demographic data, psychosocial impairment, adverse family events and relocation

The child's age and gender, and information about the family structure and income was obtained. Psychosocial impairment was defined as considerable worries

about the child's psychological or physical development, or behavior problems prior to the CSA reports. Adverse family events included two variables; 1) a dichotomous variable of parent's separation or divorce and 2) a sumscore variable describing serious illness or death of parent or other significant person. Relocation during the child's life was registered as a dichotomous variable. Adverse life events and relocation were registered for the period before and after the CSA reports.

Reports of sexual abuse

The exposure to CSA was categorized into three groups, and the children were assigned to one of three categories based on the most severe sexual abuse they had reported to their parents:

-no sexual abuse: reports of physical abuse, threats or behavior changes

-less intrusive sexual abuse: child instructed to expose genitals, fondling child's genitals or oral-genital contact

-highly intrusive sexual abuse: digital, anal or vaginal penetration and other acts involving semen

Exposure to subsequent events

Categorical and dichotomous variables were used to detect exposure to the following three events: forensic interviews, exposure in court and media coverage. Forensic interviews were scored positive whenever a child had attended at least one. Children did not appear in court, but when video's of the child's interview was shown in the courtroom, exposure in court was scored positive. Media coverage was scored as positive if the child had been exposed to "a lot" or "a whole lot" in the media in relation to the events.

Child Post-traumatic Stress Reaction Index - Parent Questionnaire (CPTS-RI)

For specific post-traumatic stress reactions, the Norwegian version of Child Posttraumatic Stress Reaction Index- Parent Questionnaire (CPTS-RI; copyrighted by Fredericks, Pynoos & Nader, 1992) was applied. Translation of CPTS-RI was completed in cooperation with one of the instrument's authors (K. Nader) by using the translation and back-translation method. The questionnaire is adapted to parents to accompany the Child Post-traumatic Stress Reaction Index. Based on observations of the child, the parents were asked about the reactions of the child. The index is a 20-item scale including a 5-point Likert frequency rating scale ranging from "none" (0) to "most of the time"(4). Although the index does not directly provide a DSM PTSD diagnosis, there is a scoring system that establishes a level of posttraumatic stress. Clinical assessments deciding the levels of severity of PTSD resulted in the following guidelines: a total score of 12 - 24 indicates a mild level of PTSD reaction; 25 - 39 a moderate level; 40 - 59 a severe level; > 60 a very severe reaction (Nader, 1997). These guidelines were empirically validated by Pynoos et al. using the DSM-III-R criteria (Pynoos et al., 1993). A number of studies have demonstrated issues of reliability and validity for the CPTS-RI. Interrater reliability for this instrument was measured at 0.94, and inter-item agreement by Cohen's kappa at .88 (Pynoos et al., 1993). CPTS-RI include PTSD symptoms from each of three main subscales and associated features in DSM IV. For the CPTS-RI, the DSM-IV Criterion B of reexperiencing trauma includes fear or upset in response to reminders, fear or upset with thoughts of the event, intrusive thoughts, intrusive images, traumatic or bad dreams, thinking there will be a recurrence of the event, and also somatic symptoms. The DSM-IV Criterion C of numbing/avoidance includes numbing of affect, a sense of isolation, loss of interest

in activities, avoidance of reminders (activities, places, people, thoughts, or conversations), and avoidance of feelings. The DSM-IV Criterion D for physiological arousal includes jumpiness, sleep disturbance, difficulty concentrating, and difficulties in impulse control (Nader, 1997).

CBCL

The CBCL is a standardised instrument for assessing a broad array of psychopathological manifestations in children and is also widely used in studies of sexually abused children (Achenbach, 1991). The instrument includes 113 items covering various kinds of behaviour. The items are scored as follows: 0 if the item is not true of the child, 1 if the item is somewhat or sometimes true, and 2 if it is very true or often true.

CBCL generates 8 syndrome scale scores: withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour and aggressive behaviour. The syndrome scales withdrawn, somatic complaints and anxious/depressed are grouped under the name “internalizing”, and internalizing score is the sum of the scores on the three internalizing scales. The syndrome scales delinquent behaviour and aggressive behaviour are grouped under the name “externalizing”, and the externalizing score is the sum of scores on the two externalizing scales. There are no well established norms for the CBCL in the Scandinavian countries. In a study of the general population in Norway published by Nøvik & Gjone (1995), the levels of behaviour problems were considerably lower than in the Achenbach normative sample (1991).

Statistical analyses

The Students T-test was applied to compare age differences, levels of adverse family events, and scores on the CBCL compared to the two groups of children with different levels of PTSD reactions. To explore differences in categorical variables between groups, Chi-square analyses were used. For analyses of variance of age, Pearson's correlation was used. The level of significance was set to 0.05.

Results

Posttraumatic stress reactions as measured by the CPTS-RI parents' questionnaire, showed that 16 children (50%) scored within the categories of "moderate" (N=15) and "severe" (N=1) posttraumatic stress reactions at follow up. This group was categorized as "high levels of PTSD" and compared to the group of 16 children with PTSD reactions within the "low" (N=9) and "doubtful" (N=9) categories, "low levels of PTSD". Assessments of exposure to distressing events and demographics were explored in the two groups, Table 2. Similar number of children in the two groups had shown impaired psychosocial functioning prior to CSA reports. There were no significant differences between the groups related to adverse events in the family. Nineteen children had moved out of the community, similar number in the two groups. More children with moderate and severe levels of posttraumatic stress reactions reported highly intrusive sexual abuse, had been exposed to extensive media coverage and involved in the court trial than children with low levels of PTSD reactions, but these differences did not reach statistical significance. All children had been exposed to medical examination, and 14 children in each group had been going through forensic interviews. Further analyses of the association between age and levels of PTSD-reactions, showed a significant correlation between the variables ($r=0.45$, $p=0.01$), Figure 1.

The children's behavior problems four years after the CSA reports, measured by the Child Behavior Checklist (CBCL), showed mean internalizing scale score of 13.5 (SD=10.0), mean externalizing scale score 10.6 (SD=8.5) and mean total scale score 37.9 (SD=24.0). Children with high levels of PTSD reactions had significantly higher scores on the total scale score than children with low levels of PTSD. More

specifically the differences between the groups were significant in internalizing scale score and social problems scale score, Table 3.

For CBCL-scores, no significant gender- or age differences were found. Controlling for age, significant correlation between CPTS-RI and CBCL internalizing score ($r=0.58$, $p=0.001$) and CPTS-RI and CBCL total score ($r=0.51$, $p=0.004$) were found, Figure 2. Hence, the association between the PTSD reactions and behavior problems was not age specific in this study.

Discussion

All children in this study had been exposed to many potential distressing events, including disclosure of alleged sexual abuse, extensive media coverage, medical examinations, forensic interviews, a court trial that split the local community, and relocation of their homes. Four years after the first reports of alleged abuse, half the children showed high levels of posttraumatic stress reactions. No explicit exposure factor explained the differences between the two groups, although there was a tendency of more severe CSA-reports, higher levels of exposure to media coverage and involvement in the court trial in children with high levels of PTSD reactions.

Older children displayed higher levels of PTSD-reaction at follow-up than younger children. The limitation of younger children in cognitive understanding and emotional reactions of shame and guilt may have protected them from developing higher levels of distress. On the other hand, current assessments of posttraumatic stress, largely based upon PTSD phenomenology in adults, may not be sensitive enough to describe adequately the distress of the younger children (Sceeringa, Zeanah, Drell & Larriew, 1995; Carrion, Weems, Ray & Reiss, 2002).

The strong associations between posttraumatic stress reactions and behavior problems indicate that the level of PTSD reactions may be followed by considerable problems in multiple aspects in the children's life, most pronounced in internalizing problems such as somatic complaints, anxiety, depression and social problems. In studies of adolescents, high comorbidity rates between anxiety and mood disorders and PTSD have been reported (Famularo et al., 1996; Ackerman et al., 1998; Lipschitz et al., 1999; Goenjian et al., 2001). Saigh et al. (2002) found that behavior problems, especially internalizing behavior problems, often developed secondary to posttraumatic stress disorder in traumatized adolescents. Hence, traumatic

experiences may not only induce posttraumatic stress reactions but also psychosocial impairment in a vulnerable period of life.

Compared to the general population in Norway, the children in this study demonstrated higher levels of behavior problems. In a community sample, Gjone and Nøvik (1995) reported the highest rates for internalizing and externalizing problems in children aged 8-9. These scores were respectively 5.1 (SD=5.4) and 6.8 (SD=6.8), compared to internalizing scale score of 18.13 (SD=9.91) and externalizing scale score of 12.88 (SD=9.92) in the children with high levels of PTSD in the current study.

This is a naturalistic study of a small group of children and their reactions to unusual and potential distressing events. As there was no perpetrator admission or conviction in this case, the validity of children's report of abuse and threats are not fully substantiated, which calls for caution in the interpretation of the abuse reports.

References

1. Achenbach, T. M. (1991). *Integrative Guide for the 1991 CBCL/4-18, YSR, and TRF Profiles*. Burlington, VT: University of Vermont, Department of Psychiatry.
2. Ackerman, P. T., Newton, J. E. O., McPherson, W. B., Jones, J. G., & Dykman, R. A. (1998). Prevalence of post traumatic stress disorder and other psychiatric diagnoses in three groups of abused children (sexual, physical, and both). *Child Abuse and Neglect*, 22, 759-774.
3. Carrion, V.G., Weems, C. F., Ray, R., & Reiss, A.L. (2002). Toward an empirical definition of pediatric PTSD: The phenomenology of PTSD symptoms in youth. *Journal of American Academy of Child and Adolescent Psychiatry*, 41, 166-173.
4. Deblinger, E., McLeer, S. V., Atkins, M. S., Ralphe, D., & Foa, E. (1989). Posttraumatic stress in sexually abused, physically abused, and nonabused children. *Child Abuse and Neglect*, 13, 403-408.
5. Dyb, G. (1995). Group work with children and their parents—a support after suspected sexual abuse in a day care center. *Tidsskrift for den Norske lægeforening*, 115, 2064-2066. In Norwegian.
6. Dyb, G., Holen, A., Steinberg, A. M., Rodriguez, N., & Pynoos, R. S. (2003). Alleged sexual abuse at a day care center: impact on parents. *Child Abuse and Neglect*, 27, 939-950.
7. Faller, K.C. (1988). The spectrum of sexual abuse in daycare: An exploratory study. *Journal of Family Violence*, 3, 283-298.

8. Famularo, R., Fenton, T., Kinscherff, R., & Augustyn, M. (1996). Psychiatric comorbidity in childhood post traumatic stress disorder. *Child Abuse and Neglect*, 20, 953-961.
9. Finkelhor, D., Williams, L. M., & Burns, N. (1988). *Nursery crimes, sexual abuse in day care*. Newbury Park, CA: Sage.
10. Gjone, H., & Nøvik, T. S. (1995). Parental ratings of behaviour problems: a twin and general population comparison. *Journal of Child Psychology and Psychiatry*, 36, 1213-1224.
11. Goenjian, A. K., Molina, L., Steinberg, A. M., Fairbanks, L. A., Alvarez, M. L., Goenjian, H. A., & Pynoos R. S. (2001). Posttraumatic stress and depressive reactions among Nicaraguan Adolescents after hurricane Mitch. *American Journal of Psychiatry*, 158, 788-794.
12. Goenjian, A. K., Pynoos, R. S., Steinberg, A. M., Najarian, L. M., Asarnow, J. R., Karayan, I., Ghurabi, M., & Fairbanks, L. A. (1995). Psychiatric comorbidity in children after the 1988 earthquake in Armenia. *Journal of American Academy of Child and Adolescent Psychiatry*, 34, 1174-1184.
13. Green, B. L., Korol, M., Grace, M. C., Vary, M. G., Leonard, A. C., Gleser, G. C., & Smitson-Cohen, S. (1991). Children and disaster: age, gender, and parental effects on PTSD symptoms. *Journal of American Academy of Child and Adolescent Psychiatry*, 30, 945-951.
14. Kelley, S. J., Brant, R., & Waterman, J. (1993). Sexual abuse of children in day care centers. *Child Abuse and Neglect*, 17, 71-89.

15. Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: results from the National Survey of Adolescents. *Journal of consulting and clinical psychology* , 71, 692-700.
16. Lipschitz, D. S., Winegar, R. K., Hartnick, E., Foote, B., & Southwick, S. M. (1999). Posttraumatic Stress Disorder in Hospitalized Adolescents: Psychiatric Comorbidity and Clinical Correlates. *Journal of American Academy of Child and Adolescent Psychiatry*, 38, 385-392.
17. Malmquist , C. P. (1986). Children who witness parental murder: Posttraumatic aspects. *Journal of American Academy of Child and Adolescent Psychiatry*, 25, 320-325.
18. Mollica, R. F., Poole, C., Son, L., Murray, C. C., & Tor, S. (1997). Effects of war trauma on Cambodian refugee adolescents' functional health and mental health status. *Journal of American Academy of Child and Adolescent Psychiatry* , 36, 1098-1106.
19. Nader, K. O. (1997). Assessing traumatic experiences in children. In: Wilson, J., & Keane, T., (Eds.) *Assessing Psychological Trauma & PTSD* (pp.291-348). New York: Guilford Press.
20. Nader, K., Pynoos, R., Fairbanks, L., & Frederick, C. (1990). Children's PTSD reactions one year after a sniper attack at their school. *American Journal of Psychiatry*, 147, 1526-1530.

21. Pynoos, R. S., Frederick, C., Nader, K., Arroyo, W., Steinberg, A., Eth, S., Nunez, F., & Fairbanks, L. (1987). Life threat and posttraumatic stress in school-age children. *Archives of General Psychiatry*, *44*, 1057-1063.
22. Pynoos, R. S., Goenjian, A., Tashjian, M., Karakashian, M., Manjikian, R., & Manoukian, G. (1993). Post-traumatic stress reactions in children after the 1988 Armenian earthquake. *British Journal of Psychiatry*, *163*, 239-247.
23. Saigh, P. A., Yasik, A. E., Oberfield, R. A., Halamandaris, P. V., & McHugh, M. (2002). An analyses of the internalizing and externalizing behaviors of traumatized urban youth with an without PTSD. *Journal of Abnormal Psychology*, *111*, 462-470.
24. Scheeringa, M. S., Zeanah, C. H., Drell, M. J., & Larrieu, J. A. (1995). Two approaches to the diagnosis of posttraumatic stress disorder in infancy and early childhood. *Journal of American Academy of Child and Adolescent Psychiatry*, *43*, 191-200.
25. Stuber, M. L., Kazak, A. E., Meeske, K., Barakat, L. P., Guthrie, D., Granier, H., Pynoos, R., & Meadows, A. (1997). Predictors of posttraumatic stress in childhood cancer survivors. *Pediatrics*, *100*, 958-964.
26. Swanston, H. Y., Plukett, A. M., O'Toole, B. I., Shrimpton, S., Parkinson, P. N., & Oates, R. K. (2003). Nine years after child sexual abuse. *Child Abuse and Neglect*, *27*, 967-984.
27. Terr, L. C. (1991). Childhood traumas: an outline and overview. *American Journal of Psychiatry*, *148*, 10-19.

28. Terr, L. C. (1983). Chowchilla revisited: the effects of psychic trauma four years after a school-bus kidnapping. *American Journal of Psychiatry*, *140*, 1543-1550.
29. Waterman, J., Kelly, R. J., Oliveri, M. K., & McCord J. (1993). (Eds.) *Behind the playground walls: Sexual abuse in preschools*. New York: Guilford Publications.
30. Winje, D., & Ulvik, A. (1998). Long-term outcome of trauma in children: the psychological consequences of a bus accident. *Journal of Child Psychology and Psychiatry*, *39*, 635-642.

Figure 1

Scatter diagram showing the association between the age of the children and the level of posttraumatic stress reactions reported at four years' follow up.

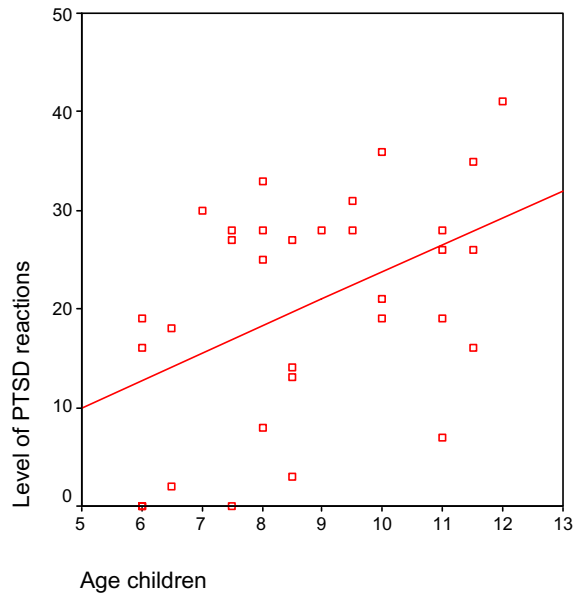


Figure 2

Scatter diagram showing the association between the level of posttraumatic stress reactions (CPTS-RI) and behavior problems (CBCL) four years after the sexual abuse reports.

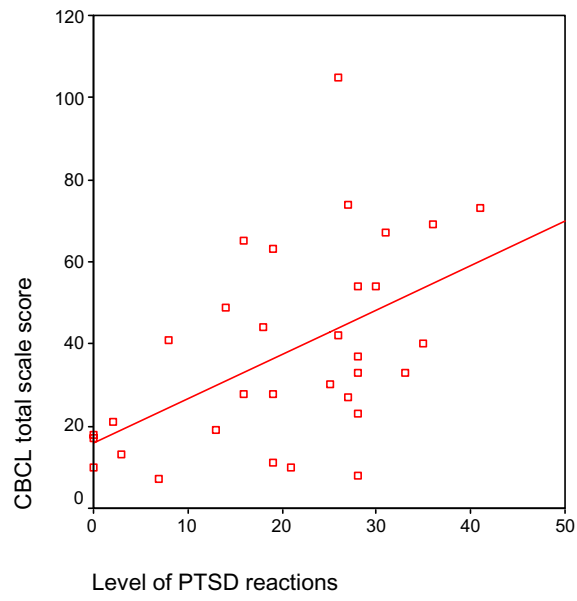


Table 1

Demographic information about the children (N=32) and their families.

	Boys (N=8)	Girls (N=24)
Age	7.94 (SD=1.84)	9.06 (SD=1.85)
Siblings in the study	3	11
Living in singleparent family	3	3
Disposable household income pr. month	3144 (SD=847)□	2083 (SD=856)
Family members in household	3.88 (SD=1.36)	4.17 (SD=0.92)

□ US \$ (income taxes are deducted)

Table 2

The table displays demographic factors, psychosocial impairment prior to CSA reports, adverse life events, relocation, categories of CSA reports and exposure to distressing events in relation to the level of posttraumatic stress reactions (CPTS-RI) four years after the alleged sexual abuse (N=32).

	<i>Low level of PTSD reactions</i> N=16	<i>High level of PTSD reactions</i> N=16	
Age (mean, SD)	8.22 (1.98)	9.34 (1.65)	p=0.09
Sex (boys/girls)	6/10	2/14	p=0.10
Impaired psychosocial functioning prior to CSA reports	5 (31.3%)	3 (18.8%)	p=0.41
Adverse family events in child's life			
Parents' divorce or separation prior to CSA reports	2 (12.5%)	5 (31.2%)	p=0.20
Parents' divorce or separation after to CSA reports	2 (12.5%)	4 (25.0%)	p=0.37
Serious illness or death in family prior to CSA reports (mean, SD)	0.62 (0.96)	0.50 (0.97)	p=0.72
Serious illness or death in family after CSA reports (mean, SD)	1.19 (1.42)	0.88 (1.36)	p=0.53
Family relocating prior to CSA reports	9 (56.3%)	9 (56.3%)	p=1.00
Family relocating after CSA reports	9 (56.3%)	10 (62.5%)	p=0.72
Children's report of Sexual abuse			
No sexual abuse	4 (25.0%)	1 (6.3%)	p=0.16
Less intrusive sexual abuse	6 (37.5%)	4 (25.0%)	
Highly intrusive sexual abuse	6 (37.5%)	11 (68.8%)	
Children exposed to extensive media coverage	4 (25.0%)	7 (43.8%)	p=0.26
Children exposed to forensic interviews	13 (81.2%)	14 (87.5%)	p=0.63
Children exposed in court	3 (18.8%)	6 (37.5%)	p=0.24

Table 3

The table displays CBCL scores (mean, SD) in relation to groups of children with high and low levels of posttraumatic stress reactions (CPTS-RI) four years after the alleged sexual abuse (N=32).

	<i>Low levels of PTSD reactions</i>	<i>High levels of PTSD reactions</i>	
	N=16	N=16	
CBCL Internalizing score	8.81(8.02)	18.13 (9.91)	p=0.01
CBCL Externalizing score	8.25 (6.18)	12.88 (9.93)	p=0.12
CBCL Social problems	1.56 (1.46)	3.06 (2.46)	p=0.05
CBCL Thought problems	0.44 (0.89)	1.13 (1.45)	p=0.12
CBCL Attention problems	2.88 (3.14)	4.38 (3.18)	p=0.19
CBCL Total score	27.00 (18.50)	47.38 (24.40)	p=0.01

Paper II



Pergamon

Child Abuse & Neglect 27 (2003) 939–950

Child Abuse
& Neglect

Alleged sexual abuse at a day care center: impact on parents[☆]

Grete Dyb^{a,b,*}, Are Holen^a, Alan M. Steinberg^c, Ned Rodriguez^d,
Robert S. Pynoos^c

^a*Department of Psychiatry and Behavioural Medicine, Faculty of Medicine, Norwegian University of Science and Technology, MTF5, NO-7489 Trondheim, Norway*

^b*Trauma Psychiatry Program, Department of Psychiatry and Biobehavioral Sciences, University of California at Los Angeles, Los Angeles, CA, USA*

^c*National Center for Child Traumatic Stress, University of California at Los Angeles, Los Angeles, CA, USA*

^d*Trauma Research Consultant, Santa Monica, CA, USA*

Received 19 July 2002; received in revised form 5 November 2002; accepted 11 November 2002

Abstract

Objective: This report describes the cascade of stressful events and secondary life changes experienced by parents in a case of alleged sexual abuse at a day care program. The study evaluated parents' Posttraumatic Stress Disorder (PTSD) symptoms and general psychological responses to the stressful events 4 years after the alleged abuse, and explored predictive factors of parental distress.

Methods: A total of 39 parents were interviewed about stressful events, life changes, and social support. Current distress reactions, psychological wellbeing, and locus of control were assessed with a battery of standardized measures.

Results: Hearing about the sexual abuse, testifying in court, hearing the verdict, and being exposed in media reports were all rated by the parents as distressing events. The majority of the parents experienced secondary life changes after the alleged sexual abuse. Four years after the alleged sexual abuse, one-third of the parents reported a high level of PTSD Intrusive symptoms and one-fourth reported a high level of PTSD Avoidance symptoms. There was a significant positive correlation between a measure of psychological wellbeing and PTSD. Secondary life changes and locus of control significantly predicted PTSD.

Conclusion: This study demonstrates that the alleged sexual abuse of children in day care and the resulting events in the legal system and the media constitute significant and chronic stressors in the

[☆]This study was supported by a fellowship from the Faculty of Medicine, Norwegian University of Science and Technology, the US-Norway Fulbright Foundation for Educational Exchange and The Unger Vetlesen Medical Fund.

*Corresponding author.

lives of the children's parents. These findings underscore the need to expand the focus of trauma-related sequelae from the child victim to their parents and family.

© 2003 Elsevier Ltd. All rights reserved.

Keywords: Child sexual abuse; Posttraumatic Stress Disorder (PTSD); Day care; Parental distress

Introduction

Childhood sexual abuse (CSA) occurs in a variety of contexts (Leventhal, 1990), with risk of abuse varying with age and developmental stage (Finkelhor, Hotaling, Lewis, & Smith, 1990; Rodriguez, Ryan, Rowan, & Foy, 1996). Recent studies indicate that penetration, higher frequency of abuse, and a close relationship to the perpetrator are related to increased symptomatology in children (Golding, Cooper, & George, 1997; Kendall-Tackett, Williams, & Finkelhor, 1993; Kendler et al., 2000). The majority of abusers are known to the child, but CSA is more often perpetrated by friends or acquaintances than family members (Edgardh & Ormstad, 2000; Fergusson, Horwood, & Lynskey, 1996; Finkelhor, 1994; Russell, 1983; Wyatt, 1985).

Several researchers have reported cases where children have been sexually abused by their adult caregivers in a day care setting (Faller, 1988; Kelley, Brant, & Waterman, 1993). Reports of alleged sexual abuse of children in day care programs vary in terms of number of victims and perpetrators, length and complexity of subsequent legal proceedings (Finkelhor, Williams, & Burns, 1988), and degree of professional attention (Waterman, Kelly, Oliveri, & McCord, 1993).

Extrafamilial CSA constitutes a major source of parental distress and posttraumatic stress symptoms (Davies, 1995; Kelley, 1990; Manion et al., 1996; Timmons-Mitchell, Chandler-Holtz, & Semple, 1996). However, none of these studies has followed parents' Posttraumatic Stress Disorder (PTSD) symptoms for more than 2 years post CSA disclosure. Thus, data regarding the chronicity and long-term impact of parental PTSD reactions to extrafamilial CSA of their children have yet to be reported in the empirical literature. The current study aimed to assess parents' PTSD symptoms and general psychological responses to a national publicized case of alleged CSA at a day care center in Norway 4 years after disclosure.

A number of additional stressful events often follow children's reports of extrafamilial CSA, such as police questioning, court proceedings, and media attention. Researchers report that parents may feel powerless and revictimized by the criminal justice system (Grosz, Kempe, & Kelly, 2000; Reyman, 1990). Burgess, Hartman, Kelley, Grant, and Gray (1990) found that parents of children testifying in court displayed higher symptoms of psychological distress than parents of non-testifying children, and Manion et al. (1998) underscored the need for investigations of parents' court experiences in studies of extrafamilial CSA. Cases of extrafamilial CSA that involve multiple victims, as in day care, often attract public and media attention and can affect an entire community (Jerusalem, Kaniasty, Lehman, Ritter, & Turnbull, 1994). In response to disclosure of cases of extrafamilial CSA, many families undergo highly adverse life changes including mothers withdrawing from the work role until safe childcare is secured and families moving to avoid further media attention and controversies in the community

(Finkelhor et al., 1988). These life changes may complicate the families' effort at recovery and change family constellation, function, and resources (Pynoos, Steinberg, & Wraith, 1995). This study aimed to describe the distressing events and secondary life changes experienced by parents after alleged sexual abuse at their children's day care center.

Social support is a potential resource for coping with CSA-related stress (Manion et al., 1998; McCord, 1993). However, friends and relatives may express rage on behalf of the child, or alternately, deny the abuse and neglect the family's difficulties (Haase, Kempe, & Grosz, 1990). Lack of perceived social support may then increase the families' isolation. In the current study, it is predicted that parents who report higher levels of perceived social support would have lower PTSD symptoms than those who report lower levels of perceived social support.

Recovery from PTSD symptoms may be influenced by an individual's sense of locus of control (LOC). As described by Meyers and Wong (1988), those high in internal control believe and act as if they can influence the events they experience. Rather than being powerless in the face of outside forces and having a strong trust in legitimate others, they feel capable of acting effectively on their own behalf. Some studies have found that internal locus of control is positively associated with recovery from distress (Regehr, Cadell, & Jansen, 1999; Valentine & Feinauer, 1993), while external locus of control is positively associated with psychopathology, including anxiety, depression, and PTSD (Casella & Motta, 1990; Meyers & Wong, 1988; Solomon, Mikulincer, & Avitzur, 1988). Relying on legitimate others in the effort to cope with a situation of alleged sexual abuse may challenge the parents and increase distress. In the current study it is predicted that parents with high external LOC will have higher levels of PTSD symptoms than those with an high internal LOC.

This study had three objectives: to describe the stressful events and secondary life changes parents experienced in a case of alleged sexual abuse at a day care program; to determine parents' PTSD symptoms and general psychological responses to the stressful events 4 years after the alleged abuse; and to explore the factors that predict parental distress.

The event: background information

In March of 1992, in a rural community of about 5,000 inhabitants in Norway, a 5-year-old girl disclosed being sexually abused by a male assistant at her day care center. Subsequently, information about this report was passed on to other parents. Shortly after, many children disclosed similar incidents; some of them reported serious sexual and physical abuse. The police initiated an extensive investigation that included medical and psychological assessments and forensic interviews. The police took statements from most of the parents. These alleged events created a controversy that soon polarized this small community. National media, including radio, TV, and newspapers devoted extensive coverage to the alleged incidents and resulting community controversy. During this time, many parents were confronted with disbelief over whether the abuse actually occurred. Most parents remained silent, trying to protect their children from further attention. Some found the situation so difficult, that they withdrew from social life. Because of emotional distress of families and parents, a child psychiatry consultant was requested for assistance. In December 1992, a therapy program was developed and implemented by the Department of Child and Adolescent Psychiatry (Dyb, 1995).

In November 1993, the case was heard by a jury in court. During the proceedings, many parents testified, and videos were shown of the children's interviews. As a result, the day care center assistant was accused the sexual abuse of 10 children. On January 31, 1994, the jury ruled that the assistant was not guilty.

Method

Subjects

After the alleged CSA, 40 families were referred to the treatment program. Another 12 families from the day care center were not referred to the treatment program, as for these children there were no indications of abuse. Four years after the reported sexual abuse, the 40 families from the treatment program were invited to participate in the present study. Twenty-five families (62.5%) agreed to participate, five (12.5%) families declined, and ten (25%) did not respond to the invitation. Only parents living together with the child victim, or who had an extended contact with the child, were included in the study. From the 25 participating families, 45 parents fulfilled these criteria, and 39 met for interviews (24 mothers and 15 fathers). The 39 parents represented 32 children (24 girls and 8 boys); 14 were siblings. The children's mean age at the time of follow-up was 8.8 years (range 6–12). Non-participating families ($N = 15$) represented 15 children (12 girls and 3 boys). These children's mean age at follow-up was 9.3 years (range 6–12). At the time of the interview, the mean age of the parents was 39.2 years ($SD = 6.4$). Twenty-eight parents were married, six were cohabiting, and five were living alone. All participating fathers and 75% of the mothers were permanently employed. On average, the mothers had reduced their time at work, by 4.2 hours per week since the abuse reports. Fathers had not reduced their working hours. The monthly income of the household was 2,175 U.S. dollars ($SD = 593.8$). The mean years of education for all parents was 14.0 years ($SD = 2.9$).

Procedure

Four years after the reported sexual abuse, the parents received an invitation letter to participate in the study. In the following months, the participating parents were interviewed face-to-face by the first author, and completed a battery of questionnaires. In families where both parents participated, they were interviewed together. Self-report measures were completed separately. All participating parents gave written informed consent. The Board of Research Ethics in Health region IV of Norway approved the study.

Instruments

A semi-structured interview was developed to assess demographics, information regarding stressful events (the child's reports of sexual and physical abuse and threats, police interviews, testifying in court, the verdict and media exposure), secondary life changes, and perceived social support. The severity of reported CSA was measured by a variable consisting of three

categories: (1) No CSA; (2) Intrusive CSA (child instructed to expose genitals, fondling child's genitals, or oral-genital contact); (3) Highly Intrusive CSA (digital, anal, or vaginal penetration, and other acts involving semen). Children were assigned to the category based on the most severe sexual behavior they had reported. Parents of siblings in this sample were categorized according to the most severe sexual abuse report from either of their two children. Three categorical variables were created to assess exposure to the following experiences: the police interview, court testimony, and media coverage. Experiences were scored positive as exposures if parents gave formal statements to the police in interviews, and if they were called to give testimony in court. Media exposure was defined as having at least one family member portrayed either by name, picture, drawing, or other information (age, occupation, etc.) in the coverage of the events. Each parent then rated the impact of these potentially stressful experiences on a five-point intensity scale (1: none, 2: a little, 3: some, 4: a lot, and 5: a whole lot). The information regarding secondary life changes was scored dichotomously and included the following:

- change of residence,
- major changes in daily activities (childcare, work, and daily routines),
- changes in spare time activities,
- change of friends.

A composite variable reflecting the number of secondary life changes was created by summing the number that each parent reported (range 0–4). Parents rated their perceptions of social support from three potential sources; their family, friends/neighbors, and colleagues on a five-point scale (1: none, 2: a little, 3: some, 4: a lot, and 5: a whole lot).

Parents' PTSD symptoms were assessed using the Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979). The IES is a 15-item self-report scale and measures PTSD symptoms clusters of intrusion and avoidance. Items are rated on a four-point intensity scale (0, 1, 3, and 5). Eid, Thayer, and Johnson (1999) reported that the Norwegian version of the scale (used in this study) possessed good internal consistency reliability and moderate test-retest reliability. The scores on intrusion and avoidance were transformed to high (score > 19), medium (score 9–19), and low (< 9), according to the cutoff values given by Horowitz (1982). Parents rated the intensity of their PTSD symptoms over the 7 days prior to the research interview.

Parents completed the General Health Questionnaire 30 (GHQ-30), a standardized self-report instrument that measures general psychological wellbeing (Goldberg & Williams, 1988). Several researchers have used the Norwegian translation of the GHQ (Malt, 1989). The GHQ-30 questions assess unpleasant emotions and inability to continue normal functioning, and the possible scoring range is 0–30. Goldberg and Williams (1988) reported on the reliability and validity of the GHQ-30, recommending that a cutoff score of 5 is correlated with significant psychopathology.

Locus of Control of Behavior is a self-report scale that measures the extent to which subjects assume personal responsibility for their behavior (Craig, Franklin, & Andrews, 1984). This scale consists of 17 items, scored 0–5 (0: disapprove, 5: approve); 10 items relate to externality; and 7 items to internality. High scores indicate externality. Craig et al. (1984) reported that the internal consistency and test-retest reliability of the scale items were high.

Statistical analyses

The Mann-Whitney test was used to compare scores on IES, GHQ and, Locus of Control for mothers and fathers, couples and single parents, and for parents who had one or two children at the day care center. Spearman's product moment correlation was used to assess associations between independent variables and between distress variables and independent variables. Multiple stepwise regression analyses were used to explore the predictive value of stressful events and other factors in regard to posttraumatic reactions.

Results

The children of 25 parents reported acts of CSA classified as highly intrusive, the children of 9 parents reported CSA classified as less intrusive, and the children of 5 parents reported no CSA. Of the parents of children with no reported CSA, three parents had children who reported physical abuse, one parent had a child who reported threats, and one child showed serious behavior changes. The majority of the parents (84.6%) gave statements to the police and met at the police station an average of 2.9 times ($SD = 2.6$). Eighteen of the parents (46.2%) testified in court. All of them had children who reported sexual abuse. All parents heard the verdict of the court case broadcast on national TV and radio. Thirty-two parents (82.1%) had at least one family member portrayed by the media in the coverage of the events, either by photo, drawings, or description. Table 1 shows the distribution of parents' ratings of distress in response to five stressful events. Of note, parents reported experiencing less distress during police interviews when compared with other stressful events.

The majority of parents reported that they experienced life changes secondary to the CSA controversy. Nineteen (48.7%) parents moved to different communities at a rate of 12% per year. Statistics of relocations in the general population in Norway show that 3.8% relocated to another community in 1992, increasing to 4.3% in 1997 (Statistics Norway, 2000). The highest rate for adults in the age group of parents in the present study, was 4.4%. Thirty-three parents (84.6%) reported major changes in daily activities, including work and childcare, 16

Table 1
Parents distress load ratings related to the cascade of stressful events

Distress	Events				
	Reports of sexual abuse ($N = 34$) (%)	Police interviews ($N = 33$) (%)	Testifying in court ($N = 18$) (%)	Verdict ($N = 39$) (%)	Media coverage ($N = 32$) (%)
1. None	–	33.3	–	–	–
2. A little	–	39.4	–	–	–
3. Some	10.3	6.1	–	–	–
4. A lot	7.7	18.2	11.1	10.3	43.8
5. A whole lot	82.1	3.0	88.9	89.7	56.2

of them had been on sick leave due to the distress. Twenty-six parents (66.7%) changed their participation in leisure activities, and 32 (82.1%), reported changing friends. The average number of secondary life changes for all parents was 2.82 (range 0–4, $SD = 1.34$).

Parents' reports of PTSD symptoms on the IES showed a mean score of 14.0 ($SD = 9.0$) on the intrusion scale, and 13.7 ($SD = 9.1$) on the avoidance scale. According to the recommended cutoff scores (Horowitz, 1982), a total of 13 parents (33.3%) were classified with high scores on the intrusion scale, 10 (25.6%) had medium scores, and 16 (41.0%) had low scores. Ten parents (25.6%) reported avoidance scores classified as high, 18 (46.2%) medium, and 11 (28.2%) low.

The mean score for the GHQ-30 for all parents was 4.4 ($SD = 4.9$). Fourteen parents scored above the cutoff score of 5, indicating that they experienced a clinically significant deficit in their sense of general psychological wellbeing (Goldberg & Williams, 1988). GHQ-30 positively correlated with IES intrusion (.45, $p < .01$) and IES avoidance scores (.32, $p < .05$). There were no significant differences between the IES and GHQ scores of mothers and fathers, couples ($N = 15$) and single parents ($N = 9$), or parents who had one or two children at the day care center.

The median level of perceived support that participants received from friends/neighbors, family and colleagues, was "some." Parents' LOC showed a mean value of external coping of 26.6 ($SD = 9.4$), which is comparable to the mean score of 28.3 ($SD = 8.5$) reported by Craig et al. (1984) for a university sample. No significant gender differences were found for perceived social support or LOC.

Table 2 presents the correlation between variables regarding exposure to stressful events (CSA reports, police interview, testifying in court, media coverage), secondary life changes, perceived social support, and LOC. Severity of reported abuse was significantly correlated with media exposure, secondary life changes, and perceived social support.

Several independent variables were significantly correlated with IES Intrusion scores: LOC ($r_s = .35$, $p < .05$); secondary life changes ($r_s = .33$, $p < .05$); and abuse severity ($r_s = .30$,

Table 2

The table displays Spearman's correlations of variables regarding exposure to stressful events, secondary life changes, perceived social support, and locus of control for 39 parents

	Severity of reported abuse	Parents' police interview	Parents' testifying in court	Parents' media exposure	Secondary life changes	Perceived social support	Locus of control
Severity of reported abuse	1.00	.17	.31	.52**	.35*	.34*	.05
Parents' police interview		1.00	.11	-.11	.28	.18	.00
Parents' testifying in court			1.00	.43**	.23	.08	.54**
Parents' media exposure				1.00	.30	.36*	.27
Secondary life changes					1.00	.34*	-.06
Perceived social support						1.00	.00
Locus of control							1.00

Spearman's rho are given.

* $p < .05$.

** $p < .01$.

Table 3

Stepwise multiple regression analyses of the contribution of distressing events and mediating factors to the level of posttraumatic stress reactions (IES) of Intrusion and Avoidance 4 years after the alleged abuse ($N = 39$)

	Variable	<i>B</i>	<i>SE</i>	β
Intrusion^a				
Step 1	Locus of control	.39	.15	.40**
Step 2	Locus of control	.39	.14	.40**
	Secondary life changes	2.24	.97	.33*
Avoidance^b				
Step 1	Locus of control	.51	.14	.53**
Step 2	Locus of control	.51	.12	.53**
	Secondary life changes	3.11	.81	.46**

^a $R^2 = .16$ for Step 1; $\Delta R^2 = .11$ for Step 2 ($p = .01$).

^b $R^2 = .28$ for Step 1; $\Delta R^2 = .21$ for Step 2 ($p = .001$).

* $p = .05$.

** $p = .01$.

$p < .05$). Participating in police interviews, media exposure, testifying in court, and perceived social support did not significantly correlate with IES Intrusion scores. IES Avoidance scores significantly correlated with LOC ($r_s = .51$, $p < .01$); secondary life changes ($r_s = .39$, $p < .05$); testifying in court ($r_s = .33$, $p < .05$); and participating in police interviews ($r_s = .32$, $p < .05$). Abuse severity, media exposure, and perceived social support did not significantly correlate with IES Avoidance scores.

Stepwise multiple regression analysis was conducted to examine the contribution of each of the stressful events and the potential mediating factors on current posttraumatic stress reactions of intrusion and avoidance. Only independent variables that significantly correlated with the dependent variable are included in the analysis. The regression analyses are presented in Table 3. The table shows that the strongest predictors of current posttraumatic stress symptoms were locus of control and secondary life changes, which accounted for 27% of the variance for intrusion and for 49% of the variance in avoidance scores.

Discussion

Results established that several events related to the CSA controversy constituted significant stress in the lives of the parents including, hearing about the sexual abuse, testifying in court, hearing the verdict, and being exposed in media reports. These findings are consistent with reports from other studies (Kelley, 1990; Manion et al., 1998). In the current study, parents' distress was more strongly related to testifying in court and hearing the court verdict, than being interviewed by the police. As described in clinical reports, parents may feel powerless and revictimized by the criminal justice system, as feelings of helplessness, anger, and fear may overwhelm parents and constitute distress reactions (Grosz et al., 2000; Haase et al., 1990; Reyman, 1990). Parents of testifying children have been shown to experience higher levels of distress than parents of non-testifying children (Burgess et al., 1990).

The majority of families experienced several secondary life changes in the wake of the CSA controversy. Grosz et al. (2000) reported similar family changes in their study of extrafamilial CSA.

One-third of the parents reported high levels of PTSD symptoms of intrusion, while just over one-quarter reported high levels of PTSD avoidance symptoms 4 years after the alleged abuse reports. The level of PTSD symptoms was significantly correlated with a lack of psychological wellbeing, indicating that the chronic PTSD symptoms caused significant distress in the lives of the parents. Thus, the results of the current study suggest that PTSD reactions in parents of CSA victims can constitute enduring sources of distress that can last for years after the incidents occurred.

In this study the correlations between the severity of reported sexual abuse, media exposure and secondary life changes, indicate that parents of children who gave reports of severe CSA, were more likely exposed to other distressing events.

Four years after the alleged sexual abuse, locus of control and secondary life changes contributed significantly to the level of posttraumatic stress, while other factors seemed less important. The effect was more pronounced for PTSD reactions of avoidance than intrusion. The positive relationship between externality and PTSD reactions suggests that relying on outside sources in their effort to cope may have hindered the recovery process. Secondary life changes altered the families' lives in many ways. These changes represented challenges like reorientation of social networks, work situation, and so on, and these situations may have increased the families' level of distress.

In this study, perceived social support was not a significant predictor of parents' distress. A possible explanation is that the level of support may have been insufficient, or that the support was not comforting. This finding suggests that social support may be difficult to provide after alleged sexual abuse (Haase et al., 1990).

There are limitations to consider when interpreting our findings. The small number of participants limits the generalizability of the findings to other samples. Further, the retrospective data are potentially subject to recall bias regarding events that occurred several years prior to the study. In addition, the lack of standardized measures of abuse, social support, and life changes, and the self-report nature of measures of distress and general health may have compromised the assessments of these constructs. Finally, although this study focused on multiple distressing events related to the abuse reports, it did not assess the impact of the community controversy surrounding the CSA on parents' distress level.

Limitations notwithstanding, this study contributes to the limited knowledge regarding the impact of extrafamilial CSA reports on parents. The findings of the study point to the need for clinical intervention and services targeted to this vulnerable population. In planning future treatment programs, clinicians should conduct assessments of the impact of these stressful events and the complexity of secondary life changes that may follow, and develop specific clinical interventions to help parents recover from these experiences.

Acknowledgments

The authors thank Lynn A. Fairbanks for statistical assistance.

References

- Burgess, A. W., Hartman, C. R., Kelley, S. J., Grant, C. A., & Gray, E. B. (1990). Parental response to child sexual abuse trials involving day care settings. *Journal of Traumatic Stress*, 3, 395–405.
- Casella, L., & Motta, R. W. (1990). Comparison of characteristics of Vietnam veterans with and without posttraumatic stress disorder. *Psychological Reports*, 67, 595–605.
- Craig, A. R., Franklin, J. A., & Andrews, G. (1984). A scale to measure locus of control of behaviour. *British Journal of Medical Psychology*, 57, 173–180.
- Davies, M. G. (1995). Parental distress and ability to cope following disclosure of extra-familial sexual abuse. *Child Abuse & Neglect*, 19, 399–408.
- Dyb, G. (1995). Arbeid i gruppe med barn og foreldre—et hjelpetiltak etter mistanke om seksuelle overgrep i en barnehage [Group work with children and their parents—a support after suspected sexual abuse in a day care center]. *Tidsskrift for Den norske laegeforening*, 115, 2064–2066.
- Edgarth, K., & Ormstad, K. (2000). Prevalence and characteristics of sexual abuse in a national sample of Swedish seventeen-year-old boys and girls. *Acta Paediatrica*, 88, 310–319.
- Eid, J., Thayer, J. F., & Johnsen, B. H. (1999). Measuring post-traumatic stress: A psychometric evaluation of symptom- and coping questionnaires based on a Norwegian sample. *Scandinavian Journal of Psychology*, 40, 101–108.
- Faller, K. C. (1988). The spectrum of sexual abuse in daycare: An exploratory study. *Journal of Family Violence*, 3, 283–298.
- Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1996). Childhood sexual abuse and psychiatric disorder in young adulthood. II. Psychiatric outcomes of childhood sexual abuse. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 1365–1374.
- Finkelhor, D. (1994). The international epidemiology of child sexual abuse. *Child Abuse & Neglect*, 18, 409–417.
- Finkelhor, D., Hotaling, G., Lewis, I. A., & Smith, C. (1990). Sexual abuse in a national survey of adult men and women: Prevalence characteristics and risk factors. *Child Abuse & Neglect*, 14, 19–28.
- Finkelhor, D., Williams, L. M., & Burns, N. (1988). *Nursery crimes, sexual abuse in day care*. Newbury Park, CA: Sage.
- Goldberg, D., & Williams, P. (1988). *A user's guide to the general health questionnaire*. Windsor, UK: NFER-Nelson.
- Golding, J. M., Cooper, M. L., & George, L. K. (1997). Sexual assault history and health perceptions: Seven general population studies. *Health Psychology*, 16, 417–425.
- Grosz, C. A., Kempe, R. S., & Kelly, M. (2000). Extrafamilial sexual abuse: Treatment for child victims and their families. *Child Abuse & Neglect*, 24, 9–23.
- Haase, C. C., Kempe, R. S., & Grosz, C. A. (1990). Non-familial sexual abuse: Working with children and their families. In R. K. Oates (Ed.), *Understanding and managing child sexual abuse* (pp. 178–201). Philadelphia, PA: W.B. Saunders/Baillière Tindall.
- Horowitz, M. J. (1982). Stress response syndromes and their treatment. In L. Goldberger & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (pp. 711–732). New York: Free Press.
- Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of event scale: A measure of subjective stress. *Psychosomatic Medicine*, 41, 209–218.
- Jerusalem, M., Kaniasty, K., Lehman, D. R., Ritter, C., & Turnbull, G. J. (1994). Individual and community stress: Integration of approaches at different levels. In S. E. Hobfoll & M. W. deVries (Eds.), *Extreme stress and communities: Impact and intervention* (pp. 105–129). Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Kelley, S. J. (1990). Parental stress response to sexual abuse and ritualistic abuse of children in day-care centers. *Nursing Research*, 39, 25–29.
- Kelley, S. J., Brant, R., & Waterman, J. (1993). Sexual abuse of children in day care centers. *Child Abuse & Neglect*, 17, 71–89.
- Kendall-Tackett, K. A., Williams, L. M., & Finkelhor, D. (1993). Impact of sexual abuse on children: A review and synthesis of recent empirical studies. *Psychological Bulletin*, 113, 164–180.

- Kendler, K. S., Bulik, C. M., Silberg, J., Hettema, J. M., Myers, J., & Prescott, C. A. (2000). Childhood sexual abuse and adult psychiatric and substance use disorders in women. *Archives of General Psychiatry*, *57*, 953–959.
- Leventhal, J. M. (1990). Epidemiology of child sexual abuse. In R. K. Oates (Ed.), *Understanding and managing child sexual abuse* (pp. 18–41). Philadelphia, PA: W.B. Saunders/Baillière Tindall.
- Malt, U. F. (1989). The validity of the general health questionnaire in a sample of accidentally injured adults. *Acta Psychiatrica Scandinavia Supplements*, *80*, 103–112.
- Manion, I., Firestone, P., Cloutier, P., Ligezinska, M., McIntyre, J., & Ensom, R. (1998). Child extrafamilial sexual abuse: Predicting parent and child functioning. *Child Abuse & Neglect*, *22*, 1285–1304.
- Manion, I. G., McIntyre, J., Firestone, P., Ligezinska, M., Ensom, R., & Wells, G. (1996). Secondary traumatization in parents following the disclosure of extrafamilial child sexual abuse: Initial effects. *Child Abuse & Neglect*, *20*, 1095–1109.
- McCord, J. (1993). Parental reactions and coping patterns. In J. Waterman, R. J. Kelly, M. K. Oliveri, & J. McCord (Eds.), *Behind the playground walls: Sexual abuse in preschools* (pp. 205–221). New York: Guilford Publications.
- Meyers, L. S., & Wong, D. T. (1988). Validation of a new test of locus of control: The internal control index. *Education and Psychological Measurement*, *48*, 753–761.
- Pynoos, R. S., Steinberg, A. M., & Wraith, R. (1995). A development model of posttraumatic stress disorder in children and adolescents. In D. Cicchetti & D. J. Cohan (Eds.), *Manual of developmental psychology* (Vol. 2, pp. 72–95). New York: Wiley.
- Regehr, C., Cadell, S., & Jansen, K. (1999). Perceptions of control and long-term recovery from rape. *American Journal of Orthopsychiatry*, *69*, 110–115.
- Reyman, M. B. (1990). Family responses to extrafamilial child sexual abuse: An overview and an experiential perspective. *Issues in Comprehensive Pediatric Nursing*, *13*, 203–220.
- Rodriguez, N., Ryan, S. W., Rowan, A. B., & Foy, D. W. (1996). Posttraumatic stress disorder in a clinical sample of adult survivors of childhood sexual abuse. *Child Abuse & Neglect*, *20*, 943–952.
- Russell, D. E. (1983). The incidence and prevalence of intrafamilial and extrafamilial sexual abuse of female children. *Child Abuse & Neglect*, *7*, 133–146.
- Solomon, Z., Mikulincer, M., & Avitzur, E. (1988). Coping, locus of control, social support, and combat-related posttraumatic stress disorder: A prospective study. *Journal of Personality and Social Psychology*, *55*, 279–285. Statistics Norway. (2000). Available at: <http://www.ssb.no>.
- Timmons-Mitchell, J., Chandler-Holtz, D., & Semple, W. E. (1996). Post-traumatic stress symptoms in mothers following children's reports of sexual abuse: An exploratory study. *American Journal of Orthopsychiatry*, *66*, 463–467.
- Valentine, L., & Feinauer, L. L. (1993). Resilience factors associated with female survivors of childhood sexual abuse. *The American Journal of Family Therapy*, *21*, 216–224.
- Waterman, J., Kelly, R. J., Oliveri, M. K., & McCord, J. (Eds.). (1993). *Behind the playground walls: Sexual abuse in preschools*. New York: Guilford Publications.
- Wyatt, G. E. (1985). The sexual abuse of Afro-American and White American women in childhood. *Child Abuse & Neglect*, *9*, 507–519.

Résumé

Objectif: Ce rapport décrit la cascade d'événements stressants et de changements causés secondairement dans la vie de parents au cours d'un programme de soins externes où il y a eu allégation d'abus sexuels. L'étude a évalué le syndrome de stress post traumatique (PTSD) et la réponse psychologique générale aux événements stressants quatre ans après l'allégation d'abus sexuels. On a évalué également les facteurs de prédiction de la détresse parentale.

Méthode: 39 parents ont été interviewés au sujet des événements stressants, de leur état psychologique et du lieu de contrôle. Une évaluation a été faite à l'aide d'une batterie de tests psychologiques standardisés.

Résultats: Tous les parents ont évalué comme des événements pénibles le fait d'être mis au courant d'abus sexuels, d'avoir à témoigner devant la Justice, d'entendre le verdict et d'apparaître dans les rapports des media. La majorité des parents ont expérimenté des changements dans leur vie à la suite des allégations d'abus sexuels. Quatre ans après, un tiers des parents ont rapporté un haut niveau de symptômes gênants de stress post traumatique et un quart ont fait état de symptômes d'évitement de stress post traumatique. Il y avait une corrélation positive significative entre l'état de bien-être psychologique et le syndrome post traumatique. Les changements secondaires dans la vie et le lieu du contrôle prédisaient significativement le stress post traumatique.

Conclusion: Cette étude démontre que les allégations d'abus sexuels sur des enfants suivis en Centre de jour et les événements qui s'ensuivent dans le système judiciaire et dans les media constituent des facteurs de stress significatifs et chroniques dans la vie des parents de ces enfants. Ces résultats soulignent la nécessité d'étendre l'intérêt pour les séquelles du traumatisme de l'enfant victime à leurs parents et à leur famille.

Resumen

Spanish-language abstract not available at time of publication.

Paper III

Subjective Features of Traumatic Experiences and PTSD in Adolescents

Grete Dyb ^{1,3}

Ned Rodriguez ²

Melissa Brymer ¹

William Saltzman ¹

Alan M. Steinberg ¹

Robert S. Pynoos ¹

¹ UCLA/Duke University National Center for Child Traumatic Stress, Department of Psychiatry and Biobehavioral Sciences, Neuropsychiatric Institute & Hospital, University of California, Los Angeles.

² Trauma Research Consultant, Santa Monica, CA.

³ Institute of Child and Adolescent Psychiatry, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway.

Address all correspondence and reprint requests to:

Grete Dyb, M.D.

National Center of Studies on Violence and Traumatic Stress

Kirkeveien 166, Bygning Z,

0407 Oslo, Norway

phone: +47 22 59 55 00

fax: +47 22 59 55 01

email: grete.dyb@nkvt.s.unirand.no

Running head: posttraumatic stress reactions in adolescents

Word count: 4 311

Abstract

This study investigated the relationships between objective and subjective features of a traumatic experience and the severity of subsequent PTSD reactions among youth that had experienced single-incident trauma types. The sample consisted of 51 multi-ethnic youth participants in a school-based intervention program serving a low socio-economic status urban community. Youth completed a brief standardized self-report screening measure of exposure to traumatic events, and a follow-up interview that further assessed their trauma history, the severity of peritraumatic reactions, and current PTSD reactions. Current PTSD reactions were significantly associated to four factors describing peritraumatic reactions; intense emotional reactions, physiological arousal, dissociation and intervention thoughts. Regression analyses indicated that these variables accounted for 40% of the variance in current PTSD reactions. The findings underscore the importance of subjective features of traumatic experiences in PTSD etiology. Assessments of traumatic experiences and PTSD reactions need to include comprehensive evaluations of these factors in research and clinical practice.

Keywords

adolescents, PTSD, trauma, exposure,

Introduction

Clinical experience and empirical studies of traumatized children and adolescents exposed to violence and disaster indicate that traumatic experiences are extremely complex, involving intense mental activity during the traumatic event (Pynoos, Steinberg & Aronson, 1997). These experiences involve intense moment-to-moment perceptual, kinesthetic and somatic experiences, accompanied by ongoing appraisals of threats, efforts to manage physiological and emotional reactions, and efforts to address the situation in thought, fantasy and behavior. Four categories that capture aspects of the immediate response to trauma include: 1) emotional reactions; 2) physiological responses; 3) cognitive activity; and 4) peritraumatic dissociative responses. Further studies are needed to investigate the extent to which these components may be related to the subsequent development, severity and course of PTSD in children and adolescents (Foy, Madvig, Pynoos & Camilleri, 1996; Salmon & Bryant, 2002).

Trauma researchers have begun to employ more in-depth evaluations of trauma exposure, including the objective features and the subjective emotional reactions that define a traumatic event as outlined in American Psychiatric Association: Diagnostic and statistical manual of mental disorders, 4th edition, (1994). Researchers have reported that the objective features are associated with the subsequent development and severity of PTSD in children after sniper attacks (Pynoos et al., 1987) and natural disasters (Green et al., 1991; Pynoos et al., 1993; Goenjian et al., 2001). Objective features were found to be less strong

predictors of PTSD symptoms in school-age children after automobile accidents (Ehlers, Mayou & Bryant, 2003). Acute reactions of terror, horror and helplessness define the subjective features of exposure, and have been found to make an independent contribution in subsequent PTSD among adolescents after Hurricane Mitch (Goenjian et al., 2001).

Physiological arousal includes sensations associated with increased heart rate, and sweating, nausea and feelings of constricted breathing. In adults, peritraumatic arousal has been associated with panic attacks in the aftermath of trauma (Nixon, Resick & Griffin, 2002) and development of PTSD (Shalev et al., 1998). PTSD research has also shown that children endorse these types of intense physiological reactions (Pfefferbaum et al., 1999).

The cognitive reaction to danger may include thoughts of intervening or taking protective action (Pynoos & Nader, 1989). Little is known, however, about cognitive reactions during the event and their role in the subsequent development of PTSD. In a recent study by Ehlers et al. (2003), cognitive factors such as negative appraisals of the event predicted chronic PTSD symptoms among children after traffic accidents.

The relationship between trauma and dissociation has gained increasing attention in recent years (Spiegel, 1984; Putnam, 1985). Studies of a variety of traumatized populations have shown that peritraumatic dissociative reactions can be significant predictor of the subsequent development of posttraumatic stress reactions (Holen, 1993; Johnson, Pike & Chard, 2001; Marmar et al., 1994, Marmar, Weiss, Metzler, Ronfeldt, & Foreman, 1996; Marmar et al., 1999; Koopman, Classen & Spiegel 1994; Tichenor, Marmar, Weiss,

Metzler & Ronfeldt, 1996). A number of studies have established that dissociative reactions can be a significant component of children's traumatic reactions (Briere et al., 2001; Kisiel & Lyons, 2001; Lansford et al., 2002; Putnam, 1993; Fein, Kassam-Adams, Vu & Datner, 2001; Goenjian et al., 2001).

The present study sought to investigate the relationship of objective and subjective features, physiological responses, peritraumatic dissociation and intervention thoughts to the subsequent development and severity of PTSD among youth exposed to community violence.

Method

Subjects

Fifty-one subjects from a school-based trauma intervention program at a middle school in a low-SES urban community participated in this study. They were 57% male (N = 29), 63% Hispanic (N = 32), 35% African-American (N = 18), attended grades 6-8, and had a mean age of 13 years (SD=1.0, range 11 – 15).

Procedure

The adolescents' guardians completed informed consent forms for the youth's participation in the study, and youth gave their assent for study participation at the time of the interviews. Researchers conducted face-to-face assessment interviews with participants. To insure adequate comprehension of instrument items, researchers read all instrument questions to youth and recorded their responses.

Instruments

Trauma History

Participants completed the Community Violence Exposure Survey (CVES) (Saltzman, Layne & Steinberg, 1998), to assess their trauma history. The CVES is a 24-item self-report inventory of community violence exposure adapted from the widely used and psychometrically standardised Survey of Exposure to Community Violence (Richters & Saltzman, 1989). The CVES assesses three possible forms of youth's exposure to violent events: direct victimization, witnessing incidents, and hearing about incidents. Queried violent events range from being shot, shot at, stabbed with a knife, and beaten, to

being seriously injured in an accident. Each participant reported experiencing one or more past traumatic events that continued to distress them at the time of the study.

The traumatic event, peritraumatic experiences and PTSD

A newly developed instrument was constructed for this exploratory study. Twelve items evaluated DSM-IV A1 and A2 objective and subjective features of exposure. Three new subscales were developed to assess peritraumatic features of the experience, including physiological arousal, dissociation, and intervention thoughts. PTSD symptoms were evaluated using items derived from the UCLA PTSD Index (Rodriguez, Steinberg & Pynoos, 2001; Steinberg, Brymer, Decker & Pynoos, 2004).

Participants started the interview with a brief writing exercise where they were asked a series of specific questions about the traumatic incident including the precipitating circumstances, the events that occurred, and their immediate consequences. Twelve questions followed that assessed DSM-IV PTSD criterion A, the objective criterion A1 and the subjective criterion A2, features that define a traumatic event. These items formed three subscales derived from factor analyses (Rodriguez, 2004). Two items assessing exposure to death and injury were summed to form the A1 subscale (range 0-2) which possessed an internal consistency of .78 (Cronbach's alpha). Five items assessing a variety of peritraumatic fears (e.g. life threat, fear of injury) were summed to derive the A2 fear subscale (range 0-5), with Cronbach's alpha =.71. Five items assessing the peritraumatic emotional reactions of horror, agitation, anger, guilt and shame were summed to form the A2 emotions subscale (range 0-5), with Cronbach's alpha =.63 (30). All items were rated on a five-point intensity scale (0=none, 1=a little, 2=some, 3=a lot, 4=a whole lot). Scores were then recoded dichotomously for analysis (0,1,2=0, 3,4=1) to

assure that a positive score represented the high intensity rating outlined for features of Criterion A in the DSM-IV.

To assess peritraumatic reactions of physiological arousal, dissociation and intervention thoughts, three scales were developed. All items in these scales were rated on a five-point intensity scale (0=none, 1= a little, 2=some, 3=a lot, 4=a whole lot). Three items described physiological reactions at the time of the trauma, including increased heart and respiration rate, and perspiration. The items formed the PA scale (Range 0-12), with internal consistency reliability of .66 (Cronbach's alpha). A five-item scale was developed to capture reports of dissociation at the time of the traumatic experience (PD), including derealization, depersonalization, and alterations in perception of time or place. PD subscale scores ranged from 0-20, with subscale internal consistency = .73 (Cronbach's alpha). The PA and PD subscales were derived by factor analysis (Rodriguez, 2004). Three items described intervention thoughts at the time of the trauma, including thoughts of altering the precipitating events, and interruption of the traumatic action by self or others. IT subscale scores ranged from 0-12, and the internal consistency was 0.63 (Cronbach's alpha).

The symptom scale contained 20 items that assessed the 17 DSM-IV PTSD symptoms. Fourteen symptoms were assessed by one item each, and three symptoms were assessed by 2 items each. Two additional items assessed the associated features of fears of reoccurrence of the traumatic event, and trauma related guilt. Participants used a rating sheet to answer each item on a 5-point frequency scale according to the frequency during the past month that they experienced each symptom. Never was rated zero, a little of the time (e.g., two times a month) = 1, some of the time (e.g., 1-2 times a week) = 2, much of the time (2-3 times a week) =3, and most of the time (e.g. almost daily) =4. The

items were summed to generate a PTSD symptom total score (Range 0-76), including the 17 PTSD symptoms and the items for the 2 associated features. Prior psychometric studies conducted in the same clinical population as reported in this study (31) indicated that the internal consistency and test-retest reliability of the Index total score is high (Cronbach's alpha = .92; Pearson's r = .84). These studies also reported that the criterion-related validity of the Index total score in diagnosing PTSD was high; sensitivity = .93, specificity = .87. In the current study, the internal consistency reliability of the Index total score was .89 (Cronbach's alpha).

Statistics

Student's t-tests were applied for analyses of gender differences and differences between the two ethnic groups (N=50). Analyses of variance (ANOVA) and Bonferroni post hoc tests were used to examine significant interactions between categories. Associations between exposure variables and outcome variables were explored by Spearman's correlation analyses. Multiple regression analyses was applied to evaluate the contribution of independent variables to the levels of current PTSD. Significance was set at .05 for all analyses.

Results

Eighty-four percent of participants (N = 43) reported exposure to multiple traumatic events during their lives. PTSD assessments were conducted in reference to the traumatic event rated by the youth as currently most upsetting. Trauma types for PTSD assessments were classified as follows: 43% (N = 22) violence witness, 31% (N = 16) learning of a violent death, and 26% (N = 13) violence victim. At the time of the study 32.7 (SD=29.7) months had elapsed since the traumatic event. There were no significant differences between the three trauma type groups for the following variables: age, time since trauma, prior traumatization, peritraumatic fears (A2 fear), and peritraumatic emotional reactions (A2 emotions). T-tests showed no significant gender or ethnic differences for levels of exposure measured by A1 and A2 scores.

The most common peritraumatic physiological reaction reported was increased heart rate, rated by seventy-five percent of the participants. The mean score on the physiological reaction subscale was 7.51 (SD=3.84), Table 1. The level of physiological reactions did not differ significantly between boys and girls, or across the ethnic groups, although significant differences were found in the levels of physiological reactions across the trauma categories (ANOVA, $F=5.20$, $df=2$, $p=0.01$). Violence witnesses reported a significantly higher level of physiological arousal (mean=9.18, SD=3.67) compared with subjects who had learned about a violent death (mean=5.44, SD=4.16, $p=0.01$). No significant differences in physiological arousal were found between victims and the other trauma type groups. The mean intervention thought (IT) subscale score was 4.98 (SD=3.20), and the mean peritraumatic dissociation (PD) subscale score was 7.76 (SD=4.87), Table 1. Fifty-five percent of the adolescents described at least one IT-item as intense or very intense at the time of the trauma, and sixty-four percent reported at

least one peritraumatic dissociative reaction as intense or very intense. Significantly higher levels of peritraumatic dissociative reactions were found among girls (mean=9.50, SD=4.20) compared with boys (mean=6.45, SD=5.00), $p=0.02$, while no significant gender differences were found in level of endorsing intervention thoughts. No significant differences were found in the levels of dissociation and intervention thoughts between ethnic groups or between the three trauma type categories.

The severity of current PTSD symptoms as measured by the PTSD Index total score was 24.67 (SD=14.49). Girls reported a higher level of PTSD symptoms (mean=26.55, SD=14.83) than boys (mean=19.72, SD=11.85), but this difference did not reach statistical significance ($p=0.07$). Trauma type did not account for any significant differences in current level of PTSD and the level of PTSD symptoms did not correlate with the time since occurrence of the traumatic event.

The trauma exposure factors of death/injury (subscale A1), fears for self and others (subscale A2 fear), peritraumatic emotional reactions (subscale A2 emotion), physiological arousal (subscale PA), peritraumatic dissociation (PD) and intervention thoughts (IT) were conceptualized as predictors of PTSD. Table 2 shows that the outcome variable, PTSD reactions, was significantly correlated with the following independent variables; A2 emotions, PA, IT and PD. The outcome variable PTSD severity was regressed on these independent variables. The multiple regression model explained 40% of the variance of current PTSD reactions, table 3. Peritraumatic emotional reactions made the greatest contribution to the variance ($\beta=0.32$, $P=0.02$), followed by peritraumatic dissociation ($\beta=0.23$, $p=0.12$), intervention thoughts ($\beta=0.22$, $p=0.12$), and physiological arousal ($\beta=0.04$, $p=0.79$).

Discussion

To our knowledge, this study is the first to investigate relationships between the objective and subjective features of trauma exposure (A1 and A2), physiological arousal (PA), intervention thoughts (IT), peritraumatic dissociation (PD) and PTSD reactions in adolescents.

Current PTSD reactions were significantly associated with four of these factors; intense emotional reactions, physiological arousal, dissociation and intervention thoughts. Regression analyses indicated that these variables accounted for 40% of the variance in current PTSD reactions.

Intense emotional reactions of anger, guilt, and shame, contributed most to the variance of PTSD reactions. This finding is consistent with reports from studies in adults (Brewin, Andrews & Rose, 2000). Thus, in the current study, peritraumatic emotional reactions of anger, guilt, and shame appeared to be important in PTSD etiology, beyond emotional reactions of fear, horror, helplessness and behavioral agitation. Although not included in the PTSD criteria in DSM-IV (1994), emotional reactions, including anger, guilt and shame need to be considered in evaluations of PTSD in youth.

The association of peritraumatic dissociation (PD) with current PTSD reactions is consistent with studies of PTSD etiology in adults (Holen, 1993; Johnson et al., 2001; Marmar et al., 1999; Koopman et al., 1994), and underscores the need to explore this phenomenon further in research and treatment settings. Also, cognitive peritraumatic reactions, defined as thoughts of intervening or taking protective action, was associated to PTSD. The systematic evaluation of intervention thoughts in this study, confirms earlier findings from clinical reports (Pynoos & Nader, 1989). Thus, cognitive aspects of

adolescents' experiences in the immediate aftermath of traumatic events, should be taken into account in PTSD assessments.

A wide range of different event characteristics and subjective aspects of the traumatic experience was assessed in this study. However, other coexisting constructs not evaluated in the study, may have influenced the development of PTSD. As shown in studies of adults, pre-trauma dissociative tendencies, acute posttraumatic reactions, personality traits, social support, locus of control, initial depression, anxiety, and prior PTSD are constructs with potential impact on posttrauma psychopathology (Engelhard, Van den Hout, Kindt, Arntz & Schouten, 2003; Freedman, Brandes, Peri & Shalev, 1999; Holena & Tarrier, 2001; Marmar et al., 1994; Marmar et al., 1996; Marshall & Schell, 2002; Ursano et al., 1999; Shalev et al., 1998).

Retrospective data are potentially subject to recall bias regarding events that occurred several months prior to the study (King et al., 2002). In a study of emergency personnel, recollections of PD were stable over time (Marmar et al., 1999), but this finding was not supported in a recent prospective study by Marshall et al. (2002).

The small number of participants in the current study limits the generalizability of the findings to other samples. Also, more definite regression analyses of multiple predictive variables have to be conducted in larger samples. Thus, future studies of PTSD etiology in youth must strive for the improvements in research design afforded by large sample size, prospective sampling, and evaluation of peritraumatic reactions immediately after traumatic experiences. However, the heterogeneity of trauma types experienced by study participants and their history of multiple traumatic events and chronic PTSD are factors often found in traumatized adolescents in clinical settings.

The findings in this study indicates that the evaluation of negative emotions, physiological reactions, peritraumatic dissociative responses and preoccupation with intervention thoughts should all be included in the evaluation and treatment of traumatized adolescents.

References

1. American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders 4th Edition*. Washington, DC: American Psychiatric Association.
2. Brewin, C.R., Andrews, B., & Rose, S. (2000). Fear, helplessness, and horror in Posttraumatic Stress Disorder: Investigating DSM-IV Criterion A2 in victims of violent crime. *Journal of Traumatic Stress*, *13*, 499-509.
3. Briere, J., Johnson, K., Bissada, A., Damon, L., Crouch, J., Gil, E., Hanson, R., & Ernst, V. (2001). The Trauma Symptom Checklist for Young Children (TSCYC): reliability and association with abuse exposure in a multi-site study. *Child Abuse and Neglect*, *25*, 1001-1014.
4. Ehlers, A., Mayou, R.A., & Bryant, B. (2003). Cognitive predictors of posttraumatic stress disorder in children: results of a prospective longitudinal study. *Behaviour Research and Therapy*, *41*, 1-10.
5. Engelhard, I.M., Van den Hout, M.A., Kindt, M., Arntz, A., & Schouten, E. (2003). Peritraumatic dissociation and posttraumatic stress after pregnancy loss: a prospective study. *Behaviour Research and Therapy*, *41*, 67-78.
6. Fein, J.A., Kassam-Adams, N., Vu, T., & Datner, E.M. (2001). Emergency department evaluation of acute stress disorder symptoms in violently injured youths. *Annals of Emergency Medicine*, *38*, 391-396.
7. Foy, D.W., Madvig, B.T., Pynoos, R.S., & Camilleri, A.J. (1996). Etiological factors in the development of posttraumatic stress disorder in children and adolescents. *Journal of School Psychology*, *34*, 133-145.
8. Freedman, S.A., Brandes, D., Peri, T., & Shalev, A. (1999). Predictors of chronic post-traumatic stress disorder. *British Journal of Psychiatry*, *174*, 353-359.
9. Goenjian, A.K., Molina, L., Steinberg, A.M., Fairbanks, L.A., Alvarez, M.L., Goenjian, H.A., & Pynoos, R.S. (2001). Posttraumatic stress and depressive reactions among Nicaraguan adolescents after hurricane Mitch. *American Journal of Psychiatry*, *158*, 788-794.
10. Green, B.L., Korol, M., Grace, M.C., Vary, M.J., Leonard, A.C., Gleser, G.C., & Smitson-Cohen S. (1991). Children and disaster: age, gender, and parental effects on PTSD symptoms. *Journal of American Academy of Child and Adolescent Psychiatry*, *30*, 945-51.

11. Holen, A. (1993). The North Sea oil rig disaster. In J. P. Wilson & B. Raphael (Eds.), *International handbook of traumatic stress syndromes* (pp.405-525). New York: Plenum.
12. Holeva, V., & Tarrier, N. (2001). Personality and peritraumatic dissociation in the prediction of PTSD in victims of road traffic accidents. *Journal of Psychosomatic Research, 51*, 687-692.
13. Johnson, D. M., Pike, J. L., & Chard, K.M (2001). Factors predicting PTSD, depression, and dissociative severity in female treatment-seeking childhood sexual abuse survivors. *Child Abuse & Neglect, 25*, 179-198.
14. King, L.A., King, D.W., Erickson, D.J., Huang, M.T., Sharkansky, E.J., & Wolfe, J. (2002). Posttraumatic stress disorder and retrospectively reported stressor exposure: A longitudinal prediction model. *Journal of Abnormal Psychology, 109*, 624-633.
15. Kisiel, C.L., & Lyons, J.S. (2001). Dissociation as a mediator of psychopathology among sexually abused children and adolescents. *American Journal of Psychiatry, 158*, 1034-1039.
16. Koopman, C., Classen, C., & Spiegel, D. (1994). Predictors of posttraumatic stress symptoms among survivors of the Oakland/Berkeley, Calif., Firestorm. *American Journal of Psychiatry, 151*, 888-894.
17. Lansford J.E., Dodge, K.A., Pettit, G.S., Bates, J.E., Crozier, J., & Kaplow, J. (2002). A 12-year prospective study of the long-term effects of early child physical maltreatment on psychological, behavioral, and academic problems in adolescence. *Archives of Pediatric Adolescent Medicine, 156*, 824-830.
18. Marshall, G.N., & Schell, T.L. (2002). Reappraising the link between peritraumatic dissociation and PTSD symptom severity: Evidence from a longitudinal study of community violence survivors. *Journal of Abnormal Psychology, 111*, 626-636.
19. Marmar, C.R., Weiss, D.S., Metzler, T.J., Delucchi, K., Best, S.R., & Wentworth, K.A. (1999). Longitudinal course and predictors of continuing distress following critical incident exposure in emergency services personell. *Journal of Nervous and Mental Disease, 187*, 15-22.
20. Marmar, C.R., Weiss, D.S., Metzler, T.J., Ronfeldt, H.M., & Foreman, C. (1996). Stress responses of emergency service personell to the Loma Priets earthquake Interstate 880 freeway collapse and control traumatic incidents. *Journal of Traumatic Stress, 9*, 63-85.

21. Marmar, C.R., Weiss, D.S., Schlenger, W.E., Fairbank, J.A., Jordan, K., Kulka, R.A., & Hough, R.L. (1994). Peritraumatic dissociation and posttraumatic stress in male Vietnam theater veterans. *American Journal of Psychiatry*, *151*, 902-907.
22. Nixon, R.D.V., Resick, P.A., & Griffin, M.G. (2002). Panic following trauma: the etiology of acute posttraumatic arousal. *Anxiety Disorders*, *18*, 193-210.
23. Pfefferbaum, B., Nixon, S.J., Krug, R.S., Tivis, R.D., Moore, V.L., Brown, J.M., Pynoos, R.S., Foy, D., & Gurwitch, R.H. (1999). Clinical needs assessment of middle and high school students following the 1995 Oklahoma city bombing. *American Journal of Psychiatry*, *156*, 1069-1074.
24. Putnam, F. W. (1985). Dissociation as a response to extreme trauma. In R. P. Kluft (Ed.), *Childhood antecedents of multiple personality* (pp. 65-97). Washington DC: American Psychiatric Press.
25. Putnam, F.W. (1993). Dissociative disorders in children: Behavioral profiles and problems. *Child Abuse and Neglect*, *17*, 39-45.
26. Pynoos, R.S., & Nader, K. (1989). Children's memory and proximity to violence. *Journal of the American Academy of Child and Adolescent Psychiatry*, *28*, 235-241.
27. Pynoos, R.S., Frederick, C., Nader, K., Arroyo, W., Steinberg, A., Eth, S., Nunez, F., & Fairbanks, L.(1987). Life threat and posttraumatic stress in school-age children. *Archives of General Psychiatry* , *44*, 1057-1063.
28. Pynoos, R.S., Goenjian, A., Tashjian, M., Karakashian, M., Manjikian, R., & Manoukian, G. (1993). Post-traumatic stress reactions in children after the 1988 Armenian earthquake. *British Journal of Psychiatry* , *163*, 239-247.
29. Pynoos, R. S., Steinberg, A.M., & Aronsen, L. (1997). Traumatic experiences: The early organization of memory in school-age children and adolescents. In P. Appelbaum, M. Elin, & L. Ueyhara (Eds.), *Trauma and memory: Clinical and legal controversies* (pp. 272-289). New York: Oxford University Press.
30. Richters, J.E., & Saltzman, W.R. (1989). Survey of children's exposure to community violence. Bethesda, MD: National Institute of Mental Health.
31. Rodriguez, N., Steinberg, A. M., Saltzman, W. S., & Pynoos, R. S. (2001). PTSD Index: Psychometric analysis of the Adolescent Version. In N. Rodriguez (Chair), *Youth PTSD assessment: Psychometric investigation of PTSD self-report instruments*. Symposium conducted at the Annual Meeting of the International Society for Traumatic Stress Studies, New Orleans, LA.

32. Rodriguez, N. (2004). *The validation of the Youth Peritraumatic Reactions Questionnaire*. Paper presented at the International Research Conference of the Family Research Laboratory, Portsmouth, NH.
33. Saltzman, W.R., Layne, C.M., & Steinberg, A.M. (1998) *Community Violence Exposure Survey (CVES)*, unpublished psychological test, University of California, Los Angeles.
34. Salmon, K., & Bryant, R.A. (2002). Posttraumatic stress disorder in children: The influence of developmental factors. *Clinical Psychology Review, 22*, 163-188.
35. Shalev, D.Y., Freedman, S., Peri, T., Brandes, D., Sahar, T., Orr, S.P., & Pitman, R.K.(1998). Prospective study of posttraumatic stress disorder and depression following trauma. *American Journal of Psychiatry, 155*, 630-637.
36. Spiegel, D. (1984). Multiple personality disorder as a post-traumatic stress disorder. *Psychiatric Clinics of North America, 7*, 101-110.
37. Steinberg, A.M., Brymer, M., Decker, K., & Pynoos, R.S. (2004). The UCLA PTSD Reaction Index. *Current Psychiatry Reports, 6*, 96-100.
38. Tichenor, V., Marmar, C.R., Weiss, D.S., Metzler, T.J., & Ronfeldt, H.M. (1996). The relationship of peritraumatic dissociation and posttraumatic stress: Findings in female vietnam theater veterans. *Journal of Consulting and Clinical Psychology, 64*, 1054-1059.
39. Ursano, R.J., Fullerton, C.S., Epstein, R.S., Crowley, B., Vance, K., Kao, T.C., & Baum, A. (1999). Peritraumatic dissociation and posttraumatic stress disorder following motor vehicle accidents. *American Journal of Psychiatry, 156*, 1808-1810.

Table 1

Mean scores of subscale items of physiological arousal, peritraumatic dissociation and intervention thoughts (0=none, 1=a little, 2=some, 3=a lot, 4=a whole lot).

Subscale Items	Mean (SD)
<u>Physiological Arousal</u>	
Heart beating fast	2.69 (3.84)
Breathing fast	1.92 (1.45)
Felt sweaty	1.08 (1.34)
<u>Peritraumatic Dissociation</u>	
Event seemed unreal	2.00 (1.40)
Felt disconnected from the body	1.80 (1.40)
Out- of- body reaction	1.49 (1.49)
Time slowed down	1.16 (1.33)
Lost track of time or place	1.31 (1.42)
<u>Intervention thoughts</u>	
Interrupt traumatic action	1.49 (1.42)
Others interrupting traumatic action	1.73 (1.42)
Escape trauma	1.76 (1.39)

Table 2

Nonparametric univariate correlations (Spearman's rho) between trauma exposure variables, physiological arousal, peritraumatic dissociation, intervention thoughts and posttraumatic stress disorder reactions.

	PTSD Total	Death/ Injury (A1)	Fear reactions (A2)	Emotional reactions (A2)	Physiological arousal (PA)	Peritraumatic dissociation (PD)	Intervention thoughts (IT)
PTSD	-	0.07	0.24	0.40**	0.40**	0.48**	0.44**
A1		-	-0.13	0.07	-0.28*	-0.11	-0.23
A2 fear			-	0.32*	0.48**	0.53**	0.29*
A2 emotions				-	0.43**	0.41**	0.37**
PA					-	0.45**	0.42**
PD						-	0.48**

*p<0.05, **p<0.01

Table 3

Summary of multiple regression analysis for variables significantly correlated to current posttraumatic stress reactions (N=51).

Variable	B	SE B	β	p
A2 emotions	3.90	1.62	0.32	0.02
Physiological arousal (PA)	0.14	0.53	0.04	0.79
Peritraumatic dissociation (PD)	0.69	0.43	0.23	0.12
Intervention thoughts (IT)	0.99	0.62	0.22	0.12

$R^2 = 0.39$, $p = 0.001$.

Paper IV

Paper IV is not included due to copyright restrictions