The Effectiveness of Psychosocial Interventions for Reducing Psychological Harm in Children and Adolescents who have Experienced Trauma: A Systematic Review and Meta-Analysis

by

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A Thesis
Presented to
The University of Guelph

In partial fulfillment of requirements
for the degree of
Master of Science
in
Family Relations and Human Development

Guelph, Ontario, Canada
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ABSTRACT

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University of Guelph 2013

Traumatic experiences can have a profound and lasting impact on the mental health of children and adolescents. In this meta-analysis, psychosocial interventions for children and adolescents who have been exposed to traumatic experiences were systematically reviewed. Twelve main intervention components were identified. Of the main intervention components, cognitive Behavioural Therapy (CBT) was the most common and the most effective at reducing Post-traumatic Stress Disorder (PTSD) /Post-traumatic Stress Symptoms (PTSS) in children and adolescents. These findings on the effectiveness of CBT add to the findings of previous reviews on intervention effectiveness on alleviating trauma symptoms in children and adolescents.

Components of Cognitive Behavioural Therapy (CBT), Exposure Therapy, Cognitive Processing Therapy (CPT), Eye Movement Desensitization and Reprocessing Therapy (EMDR), Meditation- Relaxation Therapy, Family-Focused Therapy, Psychological Debriefing, Resiliency-Focused Therapy, Sensory Therapy, Psychoeducational Therapy, Time-Limited Dynamic Therapy (TLDP-A), and general unspecific counselling were used in the various treatments. Taking into account methodological quality, there was evidence for effectiveness for school-based and sexual trauma-based interventions in alleviating trauma symptoms. More research is needed to understand the effect of methodological quality on effect sizes based on intervention type. The implications for researchers and clinicians are discussed.
For my parents, Christine and Harvey Sagle, who have always supported my love of learning. I hope I’ve made you proud.
Acknowledgements

I would like to thank the many people who helped me with this project

- My advisor, Michèle Preyde, for her constant support, guidance, and patience. Thank you for the many words of encouragement, direction, and expertise throughout this project. You always make me a priority, and your enthusiasm for the research process is infectious. I could write a whole book on how grateful I am for this opportunity, but it would not be enough. Thank You!

- My committee member, John Dwyer, and my chair of defense, Susan Chuang. This project would not have been complete without your detailed edits.

- My research assistant, Chelsea Crocker. Chelsea’s dedication, attention-to-detail, and hard work helped bring this thesis to life. I will never forget the long hours spent reading and comparing articles with her. I truly value the friendship that grew as a result of those hours.

- My family for their support and never faltering belief in my abilities. I will aim to be someone who will make you proud.

- My closest friends, Boudicca Buteau-Duitshaever, Cantrys Rondeau, Angèle Larocque, Travis Amell, Adrianna Hyde, and Aniko Komaromi, for telling me I’m wrong every time the voice in my head says it’s not good enough. I am very lucky to have you in my life. I consider you to be a part of my family too.

- My peers at the University of Guelph. You helped keep me sane! Thank you for bringing laughter into my life.
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Chapter 1

Introduction

1.1 Purpose

Traumatic exposure can have serious, negative, long-lasting effects on children and adolescents. It is common for survivors of traumatic events to experience either post-traumatic stress symptoms (PTSS) or post-traumatic stress disorder (PTSD; Cuffe et al., 1998; Giaconia et al., 1995; Goenjian et al., 1995; Yule, 2001). There is uncertainty regarding effective psychosocial interventions to reduce psychological symptoms in children and adolescents who have experienced trauma. The purpose of the current study is to conduct a systematic review and meta-analysis on the effectiveness of psychosocial interventions for reducing psychological harm caused by traumatic exposure in children and adolescents.

1.2 Psychosocial Intervention Definition

The term psychosocial intervention has been used to describe many different types of interventions throughout time in various fields (Brooker, 2001). Psychosocial interventions have been used in the treatment of pain (e.g., Whitfill, Haggard, Bierner, Pransky, Hassert, & Gatchel, 2010), work-related musculoskeletal disorders (e.g., Spitzer, LeBlanc, & Dupuis, 1987; Sullivan, Ward, Tripp, French, Adams, & Stanish, 2005), weight loss (e.g., Davis, 2012), psychosis (e.g., Patterson et al., 2005; Waldheter, 2007), stroke (e.g, Carin-Levy, Kendall, Young, & Mead, 2009; Ertel, Glymour, Glass, & Berkman, 2007), cancer (e.g., Kim, 2011; Preyde & Synnott, 2009), ADHD (e.g., Goldstein, 2004; Kaiser & Pfiffner, 2011), bi-polar disorder (e.g., Miklowitz et al., 2007), depression (e.g., Mittelman, Brodaty, Wallen, & Burns, 2008; Mossey, Knott,
Higgins, & Talerico, 1996), and PTSD (e.g., Courtney, 2012; Southwick, Gilmartin, McDonough, & Morrissey, 2006; Taylor & Baker, 2007). The term psychosocial intervention has been used to describe any program that aims to improve the psychosocial well-being of people (The Psychological Working Group, 2003).

Generally, the phrase “psychosocial” is used to emphasize the connection between an individual’s intrapersonal experience (e.g., thoughts, emotions, beliefs, values, attitudes, and behaviour) and the wider social environment (e.g., relationships, traditions, culture). The Scottish Intercolligate Guidelines Network (SIGN; 1998) defines psychosocial intervention as “those interventions for which there exists firm evidence of effectiveness”. This definition may be problematic because it does not clearly outline what qualifies as “firm evidence”. Also, the SIGN definition of psychosocial intervention does not include mention of the individual or the surrounding environment.

An alternate perspective on psychosocial interventions is based on the assumption that there is a “complex interplay between biological, environmental and sociological factors and that ambient stress together with certain life events may trigger an onset or relapse of mental health problems in some people” (Gamble & Hart, 2003, pg ). Both the individual and the surrounding environment are taken into account in the aforementioned mental health perspective. For the purposes of the following systematic review and meta-analysis, psychosocial intervention will refer to non-pharmacological therapeutic techniques that were designed to address the psychological/social aspects of an individual or group.

1.3 Thesis Outline

In the current review psychosocial intervention effectiveness was explored through the conduct of a systematic review and meta-analysis. A thorough search of interventions conducted
over a time span of approximately ten years (2000-September 2011) was performed. Each individual intervention is described. Interventions are both combined and examined separately. Chapter 1 explains the purpose of this study, as well as defines “psychosocial intervention”. The background of this project is explored in Chapter 2. The definition of traumatic events, as well as child and adolescent reactions to traumatic events are explored. PTSD/PTSS is identified as a common psychological effect of experiencing or being a witness to a traumatic event. Possible treatments for children and adolescents who have PSTD/PTSS are identified. Past systematic reviews and their outcomes are explored. Chapter 3 introduces the methods used in this project. What the search characteristics were, how research quality was assessed, and how the meta-analysis was conducted was described. The results of this project are presented in Chapter 4 and the individual interventions are described in more detail in Chapter 5. Implications for clinicians and practitioners are presented in Chapter 6. Limitations are also presented in Chapter 6.

Chapter 2

Background

2.1 Traumatic Events

According to the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000), a traumatic event is one in which both of the following are 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 and (2) the person's response involved intense fear, helplessness, or horror. In children, this may be expressed instead by disorganized or agitated behavior” (p. 463).
A traumatic event may consist of single or repeated events. The event could be natural or man-made (e.g., earthquake or school shooting) and intentional or unintentional (e.g., homicide of a family member or severe illness). The resulting effects of traumatic exposure could be immediate or appear days, weeks, or months later. Sometimes, traumatic exposure results in no psychological symptoms at all. Exposure to trauma may not always lead to impairment and some individuals might even initially display constricted or improved behaviour. Shaw et al. (1995) found an immediate decrease in disruptive behaviour in children who were exposed to a hurricane. Traumatic exposure symptoms may vary over time (Pfferbaum, 1997), decrease (Green et al., 1994), or endure or increase (Goenjian et al, 1995).

It is estimated that 1 in 4 children will experience a significant traumatic event by the time they reach adulthood (Costello, Erkanli, Fairbank, & Angold , 2002). Copeland, Keeler, Angold, and Costello (2007) reported that exposure to at least one traumatic event by the age of 16 years was reported by 68% of youth. The rates of trauma reported vary depending on the population sampled, the type of trauma experienced, and the length of time separating the trauma from the assessment (Pine & Cohen, 2002).

Trauma rates may vary depending on the population being sampled. For example, PTSD and traumatic exposure rates may differ in at risk groups. In a study conducted in New York City, NY after terrorist attacks on the World Trade Center, Hoven et al. (2005) found that the prevalence rate of PTSD among a sample of New York City students (grades 4-12) was approximately 10.6%. Conversely, rates of PTSD in a study conducted in Australia on over 800 children who were exposed to a bush fire were approximately 52.8% at 8-months after the fire (McFarlane, 1987). The sample population in the two studies differed on many variables (e.g., country of origin, traumatic event, rural vs. urban area). At risk groups may report different trauma rates than non at risk groups.
There are many different types of stressors that children and adolescents can be exposed to. The type of trauma exposure may influence trauma rates. For example, of those children and adolescents exposed to an earthquake in 1988, about 90% experienced PTSD-like reactions (Pynoos & Nader, 1993). Conversely, Servan-Schreiber, Le Lin, and Birmaher (1998) found that in a sample of 88 Tibetan refugee children residing in India, about 30% were experiencing PTSD-like symptoms. There is a large variation of reported trauma symptoms depending on the type of traumatic exposure.

Rates of trauma can vary over time. The length of time separating the trauma from the assessment may influence reported trauma rates. Approximately three months after Hurricane Andrew hit the coast of South Florida, it was reported that in a sample of 500 elementary school children 86% experienced PTSD symptoms (Vernberg, La Greca, Silverman, & Prinstein, 1996). Conversely, 18-months after an earthquake in an Armenian city, a PTSD rate of 75% among child survivors was reported. It was reported in a study conducted on over 800 Australian children exposed to a bush fire, that PTSD rates at 8-months was approximately 52.8%, while PTSD rates at 26-months was 57.2% (McFarlane, 1987). This would suggest that without treatment PTSD rates may worsen over time.

2.2 Child and Adolescent Reactions to Traumatic Event(s)

Children and adolescents have various reactions to traumatic events. Not everyone who has been exposed to a traumatic event will be affected negatively or in any way whatsoever by the experience. Many children and adolescents show resiliency in response to trauma. Resilience refers to “positive patterns of functioning or development during or following exposure to adversity, or, most simply, to good adaptation in a context of risk” (p. 4, Masten, 2006). There are a variety of factors that influence the response to trauma and affect recovery. The traumatizing event, type of exposure, gender, age, developmental level, previous exposure, prior
conditions, initial response, family influences, socioeconomic status, and cultural influences are factors that may affect the individual’s response to trauma (Pfefferbaum, 1997).

The response to trauma correlates to exposure, measured by both physical and emotional proximity. Physical proximity is measured by the physical distance from the event and being a witness to death or injury (Pfefferbaum, 1997). Emotional proximity is measured by characteristics of the traumatic event that produce emotional involvement (e.g., death or injury of a loved one; Pfefferbaum, 1997). Generally, the closer a child or adolescent is to the traumatic event the more likely they will be to have trauma symptoms. However, intense or prolonged exposure to images and descriptions of trauma through media coverage has also been shown to affect trauma response (Shaw et al., 1995). Thus, it can be concluded that individuals may not always have to experience direct exposure to a traumatic event in order to experience PTSD and PTSD-like symptoms.

Some investigators have also identified gender as a possible contributor to differential trauma response. Generally, studies with large sample sizes have reported that girls are more symptomatic than boys (Giaconia et al., 1995; Shannon, Lonigan, Finch, & Taylor, 1994). Other investigators have reported boys are more symptomatic than girls (Giaconia et al., 1995; Nader, Pynoos, Fairbanks, Al-Ajeel, & Al-Asfour, 1993; Shaw et al., 1995). This influence of gender on trauma symptoms appears to vary according to sample size, type of trauma, and area of traumatic incidence.

The child’s age and developmental level has also been found to influence the child’s exposure, perception, and understanding of the trauma (Realmuto et al., 1992). Schwarz and Kowalski (1991) found that after a school shooting, younger children were more likely to display avoidance symptoms. Conversely, older children were more likely to relive the experience
(Schwarz & Kowalski, 1991). This age related difference to in specific symptoms experienced may have an impact of treatment as well as outcome assessment measures.

Furthermore, pre-existing conditions (e.g., anxiety disorders and depression) and prior exposure to trauma increase the vulnerability of children during times of stress (Pfefferbaum, 1997). For example, in a study conducted by Garrison, Weinrich, Hardin, Weinrich, and Wang (1993) adolescents exposed to a hurricane with a history of early trauma were more likely to develop trauma symptoms. Previous conditions or circumstances may influence trauma response.

The family also has an impact on the response to trauma. Loar et al. (1996) found that parental mental health can predict changes in child trauma symptoms over time. For example, there is a positive association between child and parent symptoms (Laor et al., 1996). Furthermore, in a longitudinal study of over 800 Australian children exposed to a bushfire, McFarlane (1987) found that the mothers’ response to the disaster was a greater predictor of the development of trauma symptoms in the children. The parental response, and specifically the mother’s response, to the traumatic event may influence trauma symptoms in children.

Socioeconomic and cultural factors also affect the way in which an individual responds to trauma. Despite severe trauma, a sample of Bosnian refugee adolescents was reported to have a low rate of PTSD (Weine et al., 1995). It is possible that cultural beliefs may mitigate the effects of trauma exposure. For example, in a study conducted on Cambodian refugee children, those individuals with PTSD did not develop conduct, adjustment, or substance use disorders (Sack et al., 1994). Although research has provided evidence about predictors of trauma recovery and response, there is currently no definitive answer about who will be affected by traumatic exposure.
2.3 Post-Traumatic Stress-Disorder (PTSD)

Even though there are a variety of responses to trauma, being exposed to a traumatic event has been shown to increase the likelihood of developing anxiety disorders, depression, PTSD, substance abuse, self-harm behaviours, externalizing disorders, internalizing disorders, traumatic grief, and academic difficulty (Copeland et al., 2007; Costello et al., 2002; Giaconia et al., 1995; Green, 1994; Pynoos & Nader, 1993). A common reaction to trauma is PTSD. PTSD is characterized by recurrent and intrusive thoughts about the event, persistent avoidance of event-related stimuli, and persistent symptoms of anxiety or increased arousal.

In order to be diagnosed with PTSD, a person must have been exposed to a stressor to which they reacted with fear, helplessness, or horror. The individual must also experience symptoms of hyperarousal as well as persistent flashbacks of the event(s). Another symptom that must be present before a diagnosis of PTSD can be determined is that the individual must experience an avoidance of reminders of the event(s). Symptoms may include: nightmares, flashbacks, insomnia, irritability, impaired concentration, and consistent attempts to avoid people, places, or thoughts that are associated with the traumatic event (American Psychiatric Association, 2000).

Approximately 25% of trauma-exposed children will develop PTSD as a result of their experience (Green et al., 1994). Other estimates suggest that the rate of PTSD among child survivors of specific disasters ranges from 30-60% (Goenjian et al., 1995; Yule, 2001). In the United States, about 40% of high school students have been exposed to violence (Cuffe et al., 1998; Giaconia et al., 1995). Between 3 and 6% of those violence-exposed high school students have PTSD, while many other adolescents display PTSD-like symptoms (Cuffe et al., 1998; Giaconia et al., 1995). Without adequate treatment, PTSD and PTSD-like symptoms may last into adulthood and develop into chronic PTSD (Yule et al., 2000).
Children and adolescents, in particular, are especially at risk for developing psychological symptoms as a result of traumatic experiences. War, natural disasters, community violence, childhood maltreatment, and many other traumatic experiences can all interfere with the healthy development and functioning of a child or adolescent. Children do not respond in the same way as adults to stressful and traumatic experiences. Exposure to dangerous and threatening events affects the body’s response to stress, influencing emotion response and memories (Kaminer, Seedat, & Stein, 2005). Perry, Pollard, Blakley, Baker, and Vigilante (1995) discovered that the “flight or fight” stress response is less adaptive in young children than in older children and adults. When faced with a threatening situation, children are more likely to react with hyperarousal than adults. If the stress continues, the child will often respond by “freezing”, which is then followed by dissociation (Perry et al., 1995). This stress response puts the child at risk for future dissociation during times of stress. Prolonged and severe stress in children increases neurotransmitter activity, which may affect the way the brain develops. Stress’s effect on the brain may be the reason why investigators have found that stress in early life is associated with greater risk for developmental disorders later on in life (Perry, 1994).

Traumatic experiences during childhood and adolescence are associated with problems that last well into adulthood. In a longitudinal study that followed abused and neglected American youth into adulthood, only 22% of those followed met the criteria for resilience across eight domains of functioning (employment, homelessness, education, social activity, psychiatric disorder, substance abuse, and two measures of criminal behaviour; McGloin & Widom, 2001). Macksoud and Aber (1996) found that up to 10 years after exposure to war-related trauma, 43% of Lebanese children still demonstrated PTSD and PTSD-like symptoms (Macksoud & Aber, 1996). In a 10-year longitudinal study, Angold, Costello, Farmer, Burns, and Erkanli (2007) discovered that in a sample of over 300 trauma-exposed youth, 13% reported PTSS. Angold et
al. (2007) also discovered that the lifetime occurrence of anxiety (10%), depressive (12%), and disruptive behaviour disorders (19%) was disproportionately high among youth who have been exposed to trauma. In a study conducted on over 300 individuals, those who have been diagnosed with a lifetime case of PTSD were found to be at increased risk for depression, anxiety, and substance abuse (Giaconia et al., 1995). Moreover, exposure to traumatic events can place extreme stress on the maturation and development of children and adolescents.

2.4. Treatments for Children and Adolescents

There are various treatments available for children and adolescents who have been affected by trauma. Some forms of interventions that are commonly used to treat PTSD in children and adolescents include: pharmacotherapy, CBT, EMDR, family therapy, psychological debriefing, and exposure therapy.

2.4.1 Pharmacotherapy Interventions

The use of medication to treat PTSD and trauma symptoms has become increasingly accepted (Asnis, Kohn, Henderson, & Brown, 2004; Cyr & Farrar, 2000; Marshall & Pierce, 2000; Shalev, Bonne, & Eth, 1996; Ursano et al., 2004). The use of medication as a form of PTSD therapy is justified by the influx of research that has found that PTSD is characterised by specific psychobiological dysfunctions (Carrion et al., 2009; Charney, 2004; McGuire, 2010; Yehuda et al., 2010). It is a possibility that the different symptom clusters of PTSD (i.e., re-experiencing, avoidance, and hyper-arousal) are mediated by different neurobiological mechanisms (Charney, Deutch, Krystal, Southwick, & Davis, 1993).

Specific dysregulations of neurotransmitter systems (e.g., serotonin, noradrenaline, and dopamine) and neuroendocrine systems (e.g., the hypothalamus-pituitary-adrenal axis); as well as structural and functional neuroanatomical abnormalities may lead to the development of PTSD and PTSD-like symptoms (Bremner & Vernetten, 2004; Canive et al., 1997; Charney et
al., 1993; Connor & Davidson, 1998; Hull, 2002; Yehuda et al., 1995). Pharmacological interventions may help stabilize the neurobiological mechanisms that mediate PTSD symptoms.

While SSRI’s and other medications have shown some effectiveness in reducing PTSD symptom severity in an adult population, it is difficult to find drugs that have been tested for a child population. Approximately 70% of drugs prescribed to children have not been studied, are off-label, or unlicensed for the age group (Kemper et al., 2011). The majority of clinical trials are performed in adults, with adjustments being made for children and adolescents (Kemper et al., 2011). Until medication has been properly assessed in children and adolescents the effects of drug treatment in a child and adolescent population will remain unknown. Pharmacotherapy and similar type interventions were not included in the current review because the pharmacological effect and safety of new medicines in children has yet to be thoroughly examined by medical professionals.

2.4.2 Exposure Therapy/Cognitive Behavioural Therapy (CBT)

Exposure therapy has demonstrated some effectiveness as a treatment for PTSD. During exposure therapy, a trauma-affected individual will focus on, describe, and recall details of a traumatic experience until the individual begins to feel less anxiety about the traumatic event. In some cases, the therapist will prompt the client for omitted details (Rothbaum & Schwartz, 2002). The goal of exposure therapy is habituation, or “decreased responding to the same stimulus when presented repeatedly over time” (Rothbaum & Schwartz, 2002; p. 66). The most common type of exposure therapy is CBT. For the purposes of this review CBT is analyzed separately from other types of exposure therapy.

CBT is a form of psychotherapy in which the aim is to change an individual’s thoughts, or “cognitions”, in an attempt to influence how a person acts, or “behaves” (Westbrook, Kennerley, & Kirk, 2007). The meanings that we assign to a situation influences how we feel
and act. It is not the situation that influences our behaviour and emotions, rather it is the meanings we attach to the situation. Unfortunately, the meanings we assign to situations are not always accurate, realistic, or beneficial. Negative thoughts may lead to adverse behaviour (e.g., avoidance), which in turn reinforces our negative thoughts. This interaction between thoughts, feelings, and behaviour may create a cycle that is difficult to break. The goal of CBT is to change the way an individual thinks about and attaches meaning to certain situations/individuals (Westbrook, Kennerley, & Kirk, 2007).

In comparison to treatment studies on adult PTSD, relatively few PTSD treatment studies have been conducted with children and adolescents (Glannoupoulou, Dikalakou, & Yule, 2006). It is possible that not receiving treatment may be harmful, and the possible harms of not receiving treatment must be investigated further. Further research comparing CBT to alternate therapies should be conducted to determine the effectiveness of CBT for children and adolescents.

2.4.3 Eye Movement Desensitization and Reprocessing (EMDR)

EMDR is becoming an increasingly common treatment for PTSD and trauma symptoms in children and adolescents. EMDR generally involves the use of eye movements (or in the case of young children finger taps) during trauma recall. It is suspected that the eye movements trigger a physiological mechanism that activates the information processing system in the brain (Tufnell, 2005). Brewin (2003) suggests that that EMDR enables memories shared in a safe new context to be reprocessed with the addition of previously missing contextual information. These new memories are more likely to be recalled in response to memory triggers. Professionals remain uncertain about EMDR as a treatment for PTSD. Due to the increasing popularity of this form of therapy, as well as its possible long-term benefits, it might be beneficial to further examine EMDR.
2.4.4 Family Therapy

As previously stated, the family has been shown to influence the child’s response to trauma (Loar et al., 1996). Caregivers and parents often play a role in the development and maintenance of child anxiety disorders (Kenardy, Cobham, Nixon, McDermott, & March, 2010). Perhaps due to influence of the family on the development and maintenance of trauma symptoms in children and adolescents, family interventions have shown some promise in alleviating trauma symptoms in children and adolescents (Cobham, Dadds, Spence, & McDermott, 2010; Loar et al., 1996; Pfferbaum, 1997). Further evidence and analysis of research is needed to determine the effectiveness of family therapy.

2.4.5 Psychological Debriefing

Psychological debriefing is defined as “single-session individual psychological intervention that involves reworking, reliving or recollection of the trauma and subsequent emotional reactions” (Rose, Bisson, Churchill, & Wessely, 2002). Critical Incident Stress Management (CISM) and Critical Incident Stress Debriefing (CISD) are psychological debriefing techniques commonly used following a traumatic event (Szumilas, Wei, & Kutcher, 2010). Early research on psychological debriefing found the brief therapy technique to be beneficial for those who have experienced trauma (Everly & Boyle, 1999; Everly, Flannery, & Eyler, 2002). Most recently, however, research suggests that psychological debriefing interventions are ineffective and may be harmful (Litz, Gray, Bryant, & Adler, 2002; Roberts, Kitchiner, Kenardy, & Bisson, 2009; Rose et al., 2002). Some researchers have found psychological debriefing to increase PTSD/PTSS (Lilienfeld, 2007; Litz et al., 2002). Given that psychological debriefing may be ineffective and potentially harmful in adults, it may be necessary to examine closely the effects of these techniques on children and adolescents.
2.5 Evidence-Based Treatments

In the past three decades, there have been many advances in the development and evaluation of psychological treatments and interventions for a multitude of child and adolescent problems (La Greca, Silverman, & Lochman, 2009). In a survey conducted in 1998-1999 by the American Academy of Child and Adolescent Psychiatry and the International Society for Traumatic Stress Studies, the majority of psychiatrists preferred pharmacotherapy (20.4%; Cohen et al., 2001). For the other psychiatrists, Cognitive Behavioural Therapy (CBT) was preferred (22.6%; Cohen, Mannarino, & Rogal, 2001). Trauma-focused treatments have been developed to allow for children and adolescents to review the trauma in a safe secure environment guided by a trained professional. CBT and other trauma-focused methods have been reported to assist with the reduction of traumatic reactions (such as PTSD and behavioural issues) and aid in the development of a deeper understanding and healthier perceptions of the trauma (American Psychological Association Presidential Task Force on Posttraumatic Stress Disorder and Trauma in Children and Adolescents, 2008). Unfortunately, many of the treatments and services available for children and adolescents who have been exposed to trauma have not been empirically studied and thus the evidence of effectiveness is not known (American Psychological Association Presidential Task Force on Posttraumatic Stress Disorder and Trauma in Children and Adolescents, 2008; La Greca, Silverman, & Lochman, 2009).

Treatments that are not thoroughly researched could be helpful or they could pose a risk for those who receive them (American Psychological Association Presidential Task Force on Posttraumatic Stress Disorder and Trauma in Children and Adolescents, 2008). It is important that mental health professionals become informed on the advances in assessment and treatment methods, as well as receive ongoing training in new intervention methods. The American Psychological Association Presidential Task Force on Posttraumatic Stress Disorder and Trauma
in Children and Adolescents (2008) declared that “mental health professionals must advocate for trauma-informed treatment programs and techniques that have been studied, have empirical support, and can be implemented with children and families from diverse backgrounds and cultural experiences” (p. 5). Many people use the term “evidence based” and “empirically supported” when there is not sufficient evidence to warrant using such a phrase. However, it has increasingly become important that mental health professionals utilize evidence-based therapies that have been shown to be effective. A systematic review and meta-analysis on the effectiveness of psychosocial interventions aimed at reducing psychological harm caused by traumatic exposure in children and adolescents may provide evidence that may be useful to mental health professionals and affected others.

2.6. A Review of Reviews

Reviews on relationships, risk factors, and available therapy options for children and youth affected by traumatic exposure (e.g., Feeny, Foa, Treadwell, & March, 2004; Pfefferbaum, 1997) have been conducted. A number of researchers have also explored available psychosocial interventions for negating the effects of abuse and child maltreatment (e.g., Chaffin & Freidrich, 2004; Shipman & Taussig, 2009). For example, in a meta-analysis on the effectiveness of psychological treatments for child maltreatment, an effect size of .54, with 71% of treated participants having lower trauma than those in control conditions after intervention was reported (Skowron & Reinemann, 2005). There have also been several non-systematic reviews focusing on psychosocial treatment for PTSD and other similar trauma-related symptoms as a result of exposure to terrorism (e.g., Comer & Kendall, 2007), natural disasters (e.g., La Greca & Silverman, 2009), and war and organized violence (e.g., Ehntholt & Yule, 2006). Although these reviews may enhance understanding of trauma in children and youth, they were not
systematically conducted and were not intended to examine evidence on effectiveness of various types of intervention.

A number of investigators have studied the impact of psychosocial interventions on those who have experienced trauma. Van Emmerik et al. (2002) conducted a meta-analysis on single-session psychological debriefing and found that Critical Incident Stress Debriefing (CISD) was not effective in reducing symptoms of PTSD and other trauma-related symptoms. Van Emmerik et al. (2002) examined studies in which only one intervention session was completed by adults. The ethical and practical difficulties of conducting research after traumatic events and the lack of studies that fit the investigators’ inclusion criteria required Van Emmerik et al. (2002) to include studies that fell short of the highest methodological standards in the review. For example, psychosocial intervention studies where non-randomization was used to assign participants to intervention and control groups were included in the review. The single-session debriefing was found to be an ineffective form of intervention for those who had experienced trauma. In some cases, the single-session psychological debriefing was found to make trauma-related symptoms worse (Van Emmerik et al., 2002). This finding suggests that systematically reviewing the literature and reporting risk of harm as well as benefits is important.

Van Emmerik et al. (2002) suggest that a reason why the single-session debriefing was found to be ineffective was a result of only including interventions where single-session debriefing had been done in one month after trauma. It has been found that reactions to trauma may appear months or even years after an initial traumatic occurrence has taken place (Silverman, Ortiz, & Viswesvaran et al., 2008; American Psychiatric Association, 2000). According to the American Psychiatric Association (2000), psychological symptoms as a result of trauma usually begin within 3 months after the stressor, but symptoms could be delayed for months or even years. Thus, focusing solely on interventions that occur within a month after a
traumatic event is problematic in cases of repeated trauma as well as in cases where psychological symptoms are not apparent until months after the initial traumatic event.

There were three systematic reviews (two of which also included a meta-analysis) of psychosocial interventions that were aimed at reducing psychological symptoms in children and adolescents who have been exposed to trauma (Taylor & Chemtob, 2004; Wethington et al., 2008; Silverman et al., 2008). Taylor and Chemtob (2004) examined the efficacy of pharmacotherapy, psychotherapy, and cognitive-behavioural therapy for children and adolescents with PTSD and PTSD symptoms. The databases used in the search were MEDLINE, PILOTS, and Psychlit (1970-2003). Investigators used the following keywords in their search: “traumatic stress”, “treatment”, “psychotherapy”, “flooding”, “exposure”, “PTSD”, “behavior therapy”, “pharmacotherapy”, “drugs”, “cognitive therapy”, “randomized clinical trial”, “sexual abuse”, “physical abuse”, “natural disaster”, “death”, “illness”, “bereavement”, “community violence”, and “witness to violence”. A manual search of several key journals and the abstracts from the International Society of Traumatic Stress Studies annual meetings (1990-2000) was also conducted. Taylor and Chemtob (2004) also contacted prominent PTSD investigators to obtain information on treatment studies under investigation. Studies included in the review met the following criteria: (1) randomization of participants to an alternative treatment comparison group or a no treatment/wait-list group, (2) publication in a peer-reviewed journal, (3) exposure to a traumatic event by a child or adolescent and (4) use of trauma symptoms as at least one outcome measure. Taylor and Chemtob (2004) identified 102 published reports, of which only eight were included. One of the review authors, Chemtob, co-authored two of the eight studies included (i.e., 25%), thus, bias might have played a major role in the results of the review. Although the author bias is a difficult issue when conducting any research, Chemtob’s previous involvement with many of the reviewed articles could have influenced the way in which the review was
conducted. It was not explained how, or if, the reviewers took any measures to prevent reviewer bias.


There was no rationale provided for using this tool. Also, it was not explained how Taylor and Chemtob (2004) used the “gold standards” to assess methodology. Taylor and Chemtob (2004) included a chart in their review detailing the articles. Within the chart, articles were organized to be either a “yes” or a “no” for each of the seven components. Taylor and Chemtob (2004) did not explain how it was determined how each article was organized into either the “yes” or “no” category. There was no explanation provided for how the methodological quality of each study was determined. Risk of bias was not assessed. The reliability or the validity of the methodological assessment was not discussed or analyzed. While Taylor and Chemtob (2004) used a tool to measure methodological quality, they did not appear to take methodological quality or risk of bias into account when presenting their findings.

There were very few studies that met the inclusion criteria. As a result of the small sample size, a meta-analysis was not conducted. Without taking into account methodological quality or risk of bias, Taylor and Chemtob (2004) concluded that treatment for traumatic stress led to more improvement than either no treatment or routine community care. Taylor and Chemtob (2004) also determined that there was no convincing evidence found to support the efficacy of any specific treatment. Their search ended in 2000, presumably many primary studies have been published since that time. A systematic review examining current interventions using
more reliable methodological standards could demonstrate sufficient evidence for the effectiveness of psychosocial treatments.

Wethington et al. (2008) conducted a systematic review on the effectiveness of interventions to reduce psychological harm in children and adolescents who have experienced traumatic events. The effectiveness of individual cognitive-behavioural therapy, group cognitive behavioural therapy, play therapy, art therapy, psychodynamic therapy, and pharmacologic therapy for symptomatic children and adolescents and psychological debriefing, regardless of symptoms, was examined. The search was conducted in 2007, only included interventions conducted in countries with high economic status, and included participants who were 21 years and younger. The databases used in the search were: MEDLINE, EMBASE, ERIC, NTIS (National Technical Information Service), PsychINFO, Social Sciences Abstracts, and NCJRS (National Criminal Justice Reference Service). Investigators also searched reference lists and consulted with experts for other studies. Search terms used included generic and specific terms for treatments and different forms of trauma, as well as terms such as evaluate, effective, and outcome.

Wethington et al. (2008) overlooked the Published International Literature on Traumatic Stress (PILOTS) database. PILOTS is a database that covers all available literature from across the world on PTSD and other mental health consequences of traumatic exposure (Bedard, Greif, & Buckley, 2004). The search of this database could have allowed investigators to explore different and perhaps more relevant studies. No reason was provided for the exclusion of this very important database within the search.

After identifying studies that met the inclusion criteria, two separate investigators assessed the study design quality of the articles by using the Data Collection Instrument and Procedure for Systematic Reviews in the Guide to Community Preventive Services (Zaza et al.,
and the *Guide to Community Preventive Services: Systematic Reviews and Evidence-Based Recommendations* (Zaza et al., 2000). “The guide” dictates that the general methods for conducting systematic reviews are as follows: (1) form a systematic review development team, (2) develop a conceptual approach to organizing, grouping, and selecting interventions to evaluate, (3) search for and retrieve evidence, (4) assess the quality of and abstract information from each study, (4) assess quality of and draw conclusions about the body of evidence of effectiveness, and (5) translate the evidence of effectiveness into recommendations. An advantage of using “the guide” is that it was created for use within the public health system and consequently is aimed towards community health interventions. However, because this procedure was created for use with community interventions, evaluating clinical evidence based upon “the guide” could be problematic. As “the guide” was developed for use within community interventions, “the guide” may not be transferrable to other treatment settings.

After independently assessing the articles, two reviewers compared results. Disagreements were settled by consensus among team members. Each reviewer used “the guide” data collection form to record information from the studies. Studies were classified by design and execution. Studies classified as having the best design were those in which data were collected prospectively. Studies in which there were many measurements taken before and after treatment, or where data were collected before testing were classified as having moderate design suitability. Those studies that had no comparison group and only one single pre-post test measurement were classified as having the least desirable suitability. Studies with no comparison group were not included in the analysis.

Study execution was assessed using a penalty system. Penalties were given for limitations in population description, intervention description, sampling, exposure/outcome measurement, analytic approach, control of confounding factors, completeness, length of follow-up, and other
biases. Studies with less than one penalty were characterized as good, studies with two to four penalties were classified as fair, and studies with greater than four penalties were characterized as limited and were excluded from the review. There were no examples or explanations provided for what a limitation might be for any of the study execution components assessed. It was not explained how the reviewers determined penalties. There was no mention of other important features of study quality, such as blind or outcome reporting, being assessed. Reviewers identified 11 studies that met the quality assessment standards and specific inclusion criteria.

Reviewers used Hedges adjusted $g$ to estimate intervention effects. Hedges adjusted $g$ expresses changes in the intervention and comparison groups as standardized mean differences (SMDs; Cooper & Hedges, 1994). Unfortunately, there were some studies included within the analysis in which Hedges adjusted $g$ could not be calculated. These studies were not identified by the authors within the article. It was also explained that such studies “were represented as a point estimate of the relative change in the outcome of interest associated with the intervention, compared to the control” (Wethington et al., 2008, p.290). This could potentially be problematic when attempting the meta-analysis. For the meta-analyses, weighted summary effect sizes, 95% confidence intervals (CIs), and p-values were calculated for both fixed-effects and random-effects models. Homogeneity of effect sizes was assessed using the $Q$ statistic and then quantified with the $I^2$ statistic. The “file-drawer” or “fail-safe” number was calculated to determine whether unpublished material would overturn the study’s findings. The $Q$ statistic, $I^2$ statistic, and the “file drawer” number was calculated only for studies where the necessary information was available.

According to the Community Guide, reviews assess intervention applicability in different settings, people, and circumstances (Carande-Kulis, Maciosek, Briss, et al., 2000). However, the quality assessment measurements used by Wethington et al. (2008) were created for the specific
needs of “the guide” review processes. As previously mentioned “the guide” was specifically designed for community interventions only. As a result of the community intervention focus of “the guide” the quality assessment measurements used by Wethington et al. (2008) might not be useful in different settings.

Investigators only found evidence for effectiveness in individual and group cognitive behavioural therapy was examined. The authors explained and analyzed other types of therapies, but without a larger sample size, statistical analysis on those therapies was not possible. The standardized mean difference effect (Hedge’s adjusted g) was calculated for the therapies. Wethington et al. (2008) found that only individual cognitive behavioural therapy (with a random-effect Standardized Mean Difference effect ranging from 0.06 to 0.34 on all outcome measures) and group cognitive behavioural therapy (with a random-effect Standardized Mean Difference that ranged from 0.37 to 0.56 on all outcome measures), were effective for reducing the psychological harm in children and adolescents who have been exposed to trauma. However, since there was not enough evidence to determine the effectiveness of the other types of therapies it cannot be determined if CBT was more effective than other forms of therapies.

A similar meta-analysis and narrative review was conducted by Silverman et al. (2008) on psychosocial treatments for children and adolescents exposed to a range of traumatic events. Databases that were searched were: PsychINFO, Medline, and PILOTS. Reference lists of articles were also searched. A manual search of the following journals was also conducted: Journal of Consulting and Clinical Psychology, Journal of the American Academy of Child and Adolescent Psychiatry, Journal of Clinical Child and Adolescent Psychology, Journal of Child Psychology and Psychiatry, Journal of Traumatic Stress, and Child Maltreatment, and Child Abuse and Neglect. Treatment literature included in the review was published between the years of 1993 and 2007. Keywords used to conduct the search were: trauma, abuse, exposure, disaster,
earthquake, flood, hurricane, tornado, shooting, violence, accident, posttraumatic stress, PTSD, child, adolescent, infant, efficacy, effectiveness, clinical trial, randomized clinical trial, therapy, intervention, and treatment.

Silverman et al. (2008) chose to use two classification systems to examine the efficacy of three categories of treatment groups: trauma-focused cognitive behavioural treatment, school-based group cognitive behavioural therapy, and “all other treatment groups”. Three separate investigators reviewed each article using two separate quality assessment systems. The first quality assessment system used was developed by Nathan and Gorman (2002). Studies in this classification system are categorized along a continuum ranging from Type 1 (those studies of the highest methodological quality) to Type 6 (those studies of the lower methodological quality). Studies classified as type 1 must have randomly assigned comparison groups, blinded assessments, clear presentation of the inclusion/exclusion criteria, high quality diagnostic methods, an adequate sample size, and well explained statistical methods. Type 2 studies are those studies that lack one aspect of a type 1 study. The majority of studies analyzed in the review were type 1 studies, with a few being type 2. Nathan and Gorman (2002) do not explain how they developed with the continuum or the rationale behind it.

The second quality assessment system was established by Chambless et al. (1996) and Chambless and Hollon (1998). Reviewers used the classification system by Chambless et al. (1996) and Chambless and Hollon (1998) for the narrative evaluative summaries. Treatments were categorized by investigators into four groups: well-established treatments, probably efficacious treatments, possibly efficacious treatments, and experimental treatments. Trauma-focused cognitive behavioural therapy was classified as well-established, school-based group cognitive behavioural therapy was classified as probably efficacious, and “all other treatments” were classified as possibly efficacious or experimental. The authors define experimental studies
as those studies in which the effectiveness of the intervention is still not yet known (Silverman et al., 2008). This classification system is primarily used for exploratory analysis and assisted the researchers with classification. Neither of the systems address selective reporting bias or allocation concealment. There may be bias if participants realized that they were assigned to the control group or to the intervention group.

After quality assessment, a meta-analysis was conducted on each type of therapy. It was not explained if methodological quality played a part in the choosing of studies for the meta-analysis. The authors did not explain which study they classified as Type 1 or Type 2. The lack of evidence available necessitated the aggregation of studies according to whether the treatment approach evaluated CBT or not CBT. Four treatment outcomes (posttraumatic stress, depressive symptoms, anxiety symptoms, and externalizing behaviour problems) were examined through the meta-analysis. All treatment groups, when compared to the control condition, were reported to have a positive and moderate effect on all four treatment outcomes. There were statistically significant treatment effects for PTSS for CBT interventions with a moderate effect size \(d = .50\) and for the sexual abuse interventions \(d = .46\).

Reviewers identified 21 studies that met the quality assessment standards and specific inclusion criteria. Out of the 21 interventions examined, 11 of those targeted children and adolescents who were survivors of sexual abuse. Three of the studies targeted child and adolescents who were physically abused, three targeted those who were exposed to community violence, one targeted those exposed to a major hurricane, one targeted exposure to marital violence, one targeted any single incident trauma event (e.g., motor vehicle accident, community violence, etc.) and one looked at interventions on children and adolescents who have been involved in a motor vehicle accident.
The three aforementioned systematic reviews conducted by Silverman et al. (2008), Taylor and Chemtob (2004), and Wethington et al. (2008) did not adequately evaluate methodological quality and integrate the findings into their assessment of effectiveness. For example, the tools (if any) used by previous reviewers to assess the quality of the studies did not appear to adequately assess methodological quality. The tools neglected to adequately explore many areas of bias, such as blinding and selective outcome reporting. In order to make suggestions to practitioners on the best evidence available, it is necessary for the methodological quality of the studies to be taken into account before assessing the effect sizes of the intervention. Conclusions cannot be made about an intervention before the quality of the methodological features is taken into consideration.

The search of the previous meta-analyses ended in 2007, and it is possible that studies of high methodological quality have been published since that time. A recent all-inclusive systematic review on interventions to reduce psychological harm from traumatic experiences in children and adolescents may advance understanding of intervention effectiveness. The advances in the development of psychosocial treatments available for trauma exposed children and adolescents has made it possible to conduct a current systematic review on the effectiveness of psychosocial intervention in reducing psychological harm in trauma-exposed children and youth.

The purpose of the following systematic review and meta-analysis is to examine the effectiveness of psychosocial intervention on children and adolescents who have been exposed to any type of trauma for reducing psychological symptoms. The study adds to previous reviews on psychosocial interventions to support the facilitation of evidence-based practice. Furthermore, the following systematic review and meta-analysis will be the first review where the quality of
methodological features (e.g., such as the method of randomization) is taken into consideration when interpreting intervention effectiveness.

Chapter 3

Method

3.1 Search Characteristics

The effectiveness of psychosocial interventions on reducing psychological harm in young children and adolescents (≤18 years of age) that have been exposed to trauma was examined through a systematic search. The search included studies published in the English language from January 1st, 2000 until August 2011. A librarian was consulted to assist with the development of search terms. The keywords for the search were: Trauma*, and Child* OR teen* OR youth OR adol*, treat* OR therap* OR interven* OR program, and depress* OR anxiety OR externalizing, and efficac* OR effect* OR evaluat*. Interventions were included based upon on the following criteria: (a) child/youth (≤18 years) population, (b) any psychosocial intervention delivered by a trained professional or paraprofessional (c) randomized controlled trial or quasi-experimental trial (i.e., design included a control or comparison group), and (d) measures of psychological symptoms, such as trauma, anxiety, depression, internalising behaviour, externalizing behaviour, and PTSD. The age of 18 years old was chosen by the researchers because it was determined through a literature search on trauma interventions, that the age of 18 years was a common age cut-off for adulthood.

Two reviewers independently conducted a simultaneous search for articles fitting the inclusion criteria in the following electronic databases: ERIC (Education Resources Information Center), PILOTS (Published International Literature on Traumatic Stress), ProQuest Nursing & Applied Health Source, PsycINFO, and Social Services Abstracts. The titles of the articles were
examined by two independent researchers and the articles clearly unrelated to the search criteria were excluded. All abstracts from the included studies were reviewed independently; those that were judged to be unsuitable were excluded. The remaining full articles were judged for inclusion criteria suitability. All searches were conducted by the two independent reviewers, percent agreement was calculated, and discrepancies were discussed and resolved through consensus.

A search between January 2000 until September 2011 was also conducted on the following specific trauma-focused journals: Journal of Child and Adolescent Trauma, Journal of Trauma and Dissociation, Journal of Psychological Trauma, Journal of Traumatic Stress, Psychology Trauma: Theory Research Practice and Policy, Trauma Violence & Abuse, European Journal of Psychotraumatology, Australasian Journal of Disaster and Trauma Studies, Traumatology, Journal of Aggression, Maltreatment, & Trauma, and Journal of Loss and Trauma. As this systematic review and meta-analysis is an extension of past research conducted in the area of traumatic stress, studies that were judged by the author to be of acceptable methodological quality and reported in the previous reviews conducted by Silverman et al. (2008), Taylor and Chemtob (2004), and Wethington et al. (2008) were also included in the systematic review and meta-analysis. All reference lists of studies that were included in these reviews were also examined for any relevant studies. Study characteristics, participant characteristics, a description of the intervention and comparison conditions, outcomes, study information, and results were statistically analyzed.

3.2 Quality Assessment

Two reviewers independently assessed the methodological quality of the studies using the Cochrane Collaboration’s tool for assessing risk of bias (Higgins & Green, 2008). Percent agreement was calculated, and disagreements were settled through consensus. The generation of
allocation sequence (the procedure used to obtain the sequence for assigning participants to intervention and control/comparison conditions), allocation concealment, blinding, incomplete outcome data, selective outcome reporting, and other threats to validity are assessed with the Cochrane collaboration tool for assessing risk of bias. Two reviewers independently labelled the six criteria with either a “yes” (indicating low risk of bias), “no” (indicating a high risk of bias), or “unclear” (indicating an uncertain risk of bias). A low risk of bias was interpreted as “plausible bias unlikely to seriously alter the results”, an unclear risk of bias was interpreted as “plausible bias that raises some doubt about the results”, and a high risk of bias was interpreted as “plausible bias that seriously weakens confidence in the results”. A study was labelled as “low risk of bias” on sequence generation if the investigators adequately describe randomization in the sequence generation process. A study was labelled as “low risk of bias” on allocation concealment if both participants and investigators enrolling participants could not predict assignment. A study was labelled as “low risk of bias” on blinding of participants, personnel, and outcome assessors if blinding was used on both participants and study personnel or the outcome measurements are assessed to not be influenced by lack of blinding. A study was labelled as “low risk of bias” on outcome data if there were no missing outcome data, the missing outcome data was unlikely to affect true outcome data, the missing data was balanced across intervention groups, the missing data did not have a clinically relevant impact on intervention effects, or appropriate methods were used to impute missing data. A study was labelled as having “low risk of bias” for selective outcome reporting if all previously mentioned expected outcomes are reported in the pre-specified way. A study was labelled as “low risk of bias” on other potential threats to validity if the study appears to free from other sources of bias. Results from the independent reviewers were synthesized and presented based on ratings of methodological quality.
The tool was adapted into a checklist by the author for the purposes of this study. Each domain was scored based on evidence provided in the study. A score of 0 was assigned to those domains that had a high risk of bias, a score of 1 was assigned to those domains that had an unclear risk of bias, and a score of 2 was assigned to those domains that had a low risk of bias in accordance with the criteria established by Higgins and Green (2008). Total scores can range from 0 (high risk of bias) to 12 (low risk of bias). For the purposes of this meta-analysis, a score of less than eight was considered low quality, a score from eight to nine was considered to be of moderate quality, and any score from ten to 12 was considered high quality. A summary score was calculated independently by two separate investigators. Results of the summary score were synthesized and the agreed upon total was presented. As the Cochrane tool of assessing risk of bias is a domain-based assessment tool, relevant methodological aspects of the studies were assessed and presented individually in relation to the effect size of each intervention. The Cochrane tool for assessing risk is an important tool, which is utilized by many reviewers.

3.3 Meta-Analysis

In the exploratory meta-analysis, intervention effects were examined. After the systematic search was completed and the articles were assessed for quality, the articles were grouped based on the type of study design, type of intervention, and methodological rigour. Interventions were grouped into the following categories: School-based interventions, sexual-abuse related trauma interventions, single-incident trauma interventions, family violence interventions, general trauma interventions, and war-related trauma interventions were examined.

In a meta-analysis, a common metric is used to calculate effect size (Field & Wright, 2006). If there is homogeneity, it may be possible to combine some results to create an average effect size (Field & Wright, 2006). A meta-analysis is frequently used to examine central tendency (the expected magnitude of effect across studies), variability (the difference between
effect sizes across many studies), and prediction (to explain the variability in effect sizes across studies in terms of moderator variables) (Field & Wright, 2006).

Effect sizes were calculated using Cohen’s $d$. When calculating Cohen’s $d$, the mean of the first group (the treatment condition) is subtracted from the mean of the second group (the comparison/control condition) and then divided by the pooled standard deviation (Cohen, 1977). Specifically, Cohen’s $d$ is calculated using the following formula:

\[
d = \frac{\bar{x}_1 - \bar{x}_2}{s_{pooled}}
\]

where

\[
s_{pooled} = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}
\]

The $d$-index is appealing because it can be computed from a number of test statistics (Cooper, 1998). Cohen (1977) categorized effect size values as small (0.2 – 0.5), moderate (0.5 – 0.8), and large ( > 0.8). As previously stated, for the purposes of this review, only studies that utilized either a control or comparison group were included in the review, thus only the effect sizes of the study group and the control/comparison group will be calculated and compared. In studies in which data necessary to compute an effect size were not provided, an effect size was not computed. The relationship between intervention quality and effect size was analyzed through a correlation.

Chapter 4

Results

4.1 Search Results
The results of the search are presented in Figure 1. A total of 1,499 titles were located through the search: seven articles were from ERIC, 234 articles were from PILOTS, 628 articles came from ProQuest Nursing and Allied Health Source, 609 articles came from PsychINFO, and 21 articles came from Social Services Abstracts. Twenty-four of those articles were excluded because they were not in English. Two reviewers independently assessed the suitability of the remaining 1475 interventions for inclusion by first reviewing the title of the articles. One-hundred and sixty-one interventions fit the inclusion criteria. Percentage of agreement between reviewers was 89%. Of the 161 abstracts screened, only 93 were found to meet the inclusion criteria. The reasons for exclusion were as follows: not primary research (27 articles), no intervention (15 articles), adult population (12 articles), not related to intervention (i.e., explanation of the intervention but no actual data collected; nine articles), and not a relevant outcome (five articles). Percentage of agreement between reviewers was 86%. There were 93 full articles that were screened for inclusion suitability. Fifty articles were found to fit the pre-defined search criteria. Full articles were excluded for the following reasons: not child focused (one article), age (13 articles), no intervention (one article), not primary research (seven articles), not a relevant outcome (three articles), not related to intervention (five articles), non peer-reviewed (e.g., dissertations, presentations; 13 articles). Percentage of agreement was 84%.

Journals were searched manually for any articles that may have been missed in the search and the reference lists of studies that were included in this review were also searched for any relevant studies. There were 14 interventions found in the manual search that met the inclusion criteria. Articles were then excluded based upon research design. Only those interventions that had a randomized control trial design (those interventions that were compared with a wait-list control group) or a randomized clinical design (those interventions that were compared with an alternate intervention) were included. Including the electronic search, the
manual journal search, and the search of the reference lists, a total of 35 articles were identified. Two of those articles were follow-up studies. Thirty-three interventions in total were identified through the search.

4.2 Study Characteristics

The randomized control trials and randomized clinical trials were separated. There were a total of 33 studies in which a research design was used that included either a control or comparison group. Study characteristics, results, quality rating, and effect sizes are presented in Table 1. The majority of studies had a methodological quality rating that was equal to or greater than eight (78%). There were seven studies included that had a quality rating less than eight (21%). The average quality of the included studies is presented in Table 2. Correlational analysis revealed a statistically non-significant correlation between effect size and methodological quality ($r = -.02, ns$). The quality of each individual article is explored further in the results section.

The sample sizes of the studies ranged from small ($n = 14; \text{Jaberhgaderi, Greenwald, Rubin, Zand, & Dolatabadi, 2004}$) to large ($n = 495; \text{Tol, Komproe, Susanty, et al., 2008}$). All included studies contained a component of randomization but approximately half reported the randomization process used in the study ($n = 16$). In some of the articles, randomization was stated but not consistently used. For example, Basu et al. (2009) initially started with a randomized control trial design, but upon completion of the study the researchers split the intervention group into completers and those who attended four sessions for the purposes of analysis. Attrition was adequately reported in the majority of the studies. Attrition varied in the studies. Intention to treat analysis was conducted on 12 (36%) of the studies. The most common method of intention to treat analysis was reported to be “last observation carried forward”. Given
the potential usefulness of the interventions, improvements can be suggested accounting for drop-outs in the studies.

The assessed studies were conducted in many countries throughout the world. There were interventions conducted in 13 countries (Australia, Bosnia, Canada, Germany, Indonesia, Iran, Israel, Nepal, The Netherlands, Sri Lanka, Sweden, the United Kingdom, the United States of America (USA)). The majority of the studies were conducted in the USA (n = 17). The second most common intervention location was Israel (n = 3). The majority of the studies were conducted in the USA; hence comparisons between countries was not made.

There were 12 different types of main intervention components used: exposure therapy, Eye Movement Desensitization and Reprocessing (EMDR), Cognitive Behavioural Therapy (CBT), Cognitive Processing Therapy (CPT), psychoeducational, psychological debriefing, family therapy, meditation/relaxation therapy, time limited dynamic therapy, resiliency focused, sensory/art therapy, and general counselling (either group or individual). The average effect size of each intervention type and study quality is presented in Table 3. Many of the researchers used multiple intervention components to develop an intervention that was suitable for the target population. The majority of the researchers reported using a component of CBT in the intervention (n = 16). The second most commonly used intervention component was EMDR (n = 6).

4.3 Effect Sizes

Effect sizes were calculated when a statistically significant result was reported. Effect sizes were only calculated when there was enough information reported to compute an effect size. There was only one study that did not report enough information to calculate an effect size (See Raider, Steele, Delillo-Storey, Jacobs, & Kuban, 2008). Since the study was a pilot study, Raider et al. (2008) only ran a correlation statistical analysis between two different post-
traumatic stress measures. There were no reported means, standard deviations, standard errors or any other test statistics reported. Of the 33 identified studies, two studies contained a three-group research design with two experimental conditions and a wait-list control comparison (Chemtob, Nakashina, & Hamada, 2002; King et al., 2000). There was no statistically significant difference between the two experimental conditions in both studies. However, there was a statistically significant difference between the two experimental conditions and the wait-list control group in both studies.

There were 19 interventions that were compared against a no intervention wait-list control (Randomized Control Trial). Of the randomized control trial interventions that were statistically significant, the mean effect size of the interventions where a no intervention wait-list control \( n = 16 \) was used was \( d = 0.88 \), indicating a high effect size. Of the 16 randomized control trials, eight were of high quality. The study conducted by Raider et al. (2008) was a randomized control trial but the study did not contain enough information to calculate a Cohen’s \( d \) effect size could not be calculated and thus is excluded from the previous statistic. The two remaining two interventions did not have a statistically significant result.

Regarding randomized controlled trials, there were two studies in which the intervention group did not differ significantly from the wait-list control group (Basu, Malone, Levendosky, & Dubay, 2009; Jordans, Komproe, Tol, Kohrt, Luitel, et al., 2010). In Basu et al.’s (2009) study, both the mother and child participated in separate interventions. The intervention did have some positive effects on the mother, but as the mother was not the focus of the present analysis, those data were not analyzed. Furthermore, there was high attrition in the study, which may have had an impact on the results of the study. In the study conducted by Jordans et al. (2010), PTSD symptoms improved in both the intervention and wait-list control group over time. There were, however, positive results on other non-PTSD/PTSS measures. There were significant reductions
in psychological difficulties and aggression in boys, increased pro-social behaviour among girls, and increased hope for older children. However, these outcomes were not the focus of the present study and thus were not analyzed. There were no negative effects of any of the interventions reported in any of the studies. With the exception of the aforementioned two studies, the results of the analysis of randomized control trials indicate that any variation of treatment is more effective for PTSS and PTSD symptoms than a no treatment wait-list control.

There were 16 studies in which two interventions were compared (randomized clinical trial); of these, seven were reported to have statistically significant differences between the treatment group and the comparison group after completion of the intervention, and their quality rating was moderate (9.1). Of the statistically significant interventions randomized clinical trials (n = 7), the mean effect size for studies in which comparison between two interventions was made was $d = 0.62$, signifying a medium effect size. Two of the statistically significant interventions were compared against a routine care condition (See Cohen & Mannarino, 1998; Cohen, Mannarino, & Knudsen, 2005; Farkas et al., 2010). In both instances, the therapy was statistically significantly more effective than the routine care option. The therapies that were statistically significantly more effective were directed towards sexual abuse survivors (CBT) and youth in protective services (EMDR). Four of the identified statistically significant therapies directed towards sexual abuse survivors contained components of CBT (See Cohen, Deblinger, Mannarino, and Steer, 2004; Cohen & Mannarino, 1998; Cohen, Mannarino, Iyengar, 2011; Cohen, Mannarino, & Knudsen, 2005; Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011; Deblinger, Mannarino, Cohen, & Steer, 2006).

The remaining six interventions did not differ statistically significantly from the comparison group. One of the statistically non-significant studies had a treatment as usual component (See Deblinger et al., 2001). The CBT treatment was designed to alleviated PTSD
symptoms in sexual abuse survivors. Overall, there were a wide range of intervention and comparison groups consisting of multiple components. In some cases, the comparison group only differed from the intervention group on one component. For example, in the case of the study conducted by researchers Layne et al. (2008), the only difference between the intervention and comparison group is the addition of a trauma-grief therapy component to the intervention group. One study that was conducted before the year 2000 was included in the review and was included because a follow-up study was published after the year 2000 (See Cohen & Deblinger, 1998 & Cohen et al., 2005).

4.4 Methodological Quality and Effect Size

Previous meta-analysis on interventions directed at alleviating PTSD/PTSS symptoms in children and adolescents did not take the quality of the studies into account. Only approximately half (51%) of all identified studies were found to be of high quality. A summary of the moderate and high quality studies is presented in Table 3. There was a wide range of research methodological quality in this study. The relationship between methodological quality and effect size is demonstrated in Table 4. There were seven studies with a quality rating less than eight, 13 studies with a quality rating of seven to nine, and 16 studies with a quality rating from ten to 12. Methodological quality of the studies ranged from low (5) to high (12). On average, studies rated less than six for quality were more likely to report interventions with a high effect size. Visually, studies that were rated from a ten to 12 for quality were less likely to report interventions that have a high effect size.

When taking into account the quality of the research, the interventions with the strongest evidence for effectiveness were variations of CBT. CBT was the most commonly studied intervention. Sixteen interventions included elements of CBT (See Berger et al., 2007; Cohen & Mannarino, 1998; Cohen et al., 2004; Cohen et al., 2005; Cohen et al., 2011; Deblinger et al.,
CBT was shown to be more effective than an alternate therapy in four of the studies (See Cohen & Mannarino, 1998; Cohen et al., 2004; Cohen et al., 2005; Cohen et al., 2011; Deblinger et al., 2006; Gilboa-Schechtman et al., 2010). CBT was found to be more effective than CCT, non directive supportive therapy (NST), and time-limited dynamic therapy (TL-DT). The methodological quality of the studies was high (11.5). The mean effect size of the interventions, however, was small \( (d = 0.37) \). Since there was relatively few studies comparing CBT against other types of therapies, evidence of effectiveness for CBT compared to an alternate therapy is inconclusive.

There were three studies in which CBT was not more effective than the alternate therapy (See Deblinger et al., 2001; de Roos et al., 2011; Jaberghaderi et al., 2004). CBT was not more effective than general supportive treatment and EMDR in the trials. CBT was examined against a wait-list control in seven of the studies. The overall quality of these studies was moderate (8.8), however, the effect size of treatment was large \( (d = 0.97) \). In three of the studies, therapy containing a component of CBT was compared to another therapy containing a different component of CBT (See Deblinger et al., 2011, Jaycox et al., 2010; King et al., 2000). School-based CBT was compared to TF-CBT (See Jaycox et al., 2010), child-alone CBT was compared to family-based CBT (See King et al., 2000), and TF-CBT plus trauma narrative was compared to TF-CBT without trauma narrative (both at eight-weeks and 16-weeks; See Deblinger et al., 2011). There was only one reported significant difference found between one type of therapy containing CBT components and another type of therapy containing CBT components (Deblinger et al., 2011). In one study, CBT with trauma narrative and CBT without trauma narrative were examined. Length of treatment (therapy for eight weeks or 16 weeks) was also
assessed in the study. The longer therapy produced less PTSD symptoms than the shorter therapy, but there were no found significant differences between CBT with and without trauma narrative. The quality of the study was moderate (7), and the effect size of therapy length was small ($d = 0.44$). In another one of the studies, individual community-based CBT was compared to a school-based CBT (Jaycox et al., 2010). The quality of the study was moderate (9) and there was no significant difference between the two therapies. The third study compared child alone CBT, family CBT, and a wait-list. The quality of the study was moderate (8), and there was no significant difference between child alone and family CBT.

The next most commonly studied therapy, EMDR, also demonstrated some evidence for effectiveness. There were six interventions that utilized components of EMDR (See Ahmad et al., 2007; Chemtob et al., 2002; de Roos et al., 2011; Farkas et al., 2010; Jaberghaderi et al., 2004; Kemp et al., 2009). Of those five studies, EMDR was more effective than a wait-list control in three of the studies (See Ahmad et al., 2007; Chemtob et al., 2002; Kemp et al., 2009). The average quality of the studies with a wait-list control group was high (10.6), and the effect size was medium ($d = 0.67$). There were three studies in which EMDR was compared to an alternate treatment (See de Roos et al., 2011; Farkas et al., 2010; Jaberghaderi et al., 2004). In two of the studies, EMDR was compared to variations of CBT (See de Roos et al., 2011 & Jaberghaderi et al., 2004). EMDR was not significantly different from CBT in either of the studies. The average quality of the two studies was high (11). EMDR was also compared against a routine treatment condition. EMDR was more effective than the routine treatment condition. The quality of the study was high (10) and the effect size at post-test was small ($d = 0.42$). The effect was still significant at follow-up. The effect size at the three month follow-up test was small ($d = 0.37$).
There was not enough evidence available to determine the strength of the other types of interventions and therapies. Given the varying quality of the studies and lack of reporting, it is difficult to determine the full extent of the effectiveness of the studied therapies. The higher the quality of the study, the more reliable the results of the study are. From this review, there were 17 out 33 (51%) of studies that were rated as being of high quality (a quality rating of 10-12). Of these 17 studies, 13 of the interventions demonstrated a significant effect size (Cohen’s \(d\)). All of the high quality studies that compared an intervention against a wait-list control (\(n = 9\)) were significant. The average effect size of the significant high quality studies that compared an intervention with a wait-list control was high (\(d = 0.85\)). The effect size may suggest that therapy, regardless of type, was more effective than not receiving therapy or treatment (i.e., wait-list) in reducing psychological harm in children and adolescents who have been exposed to trauma. However, as this is only approximately half of the studies, any conclusions made concerning efficacy should be taken with caution. The remaining interventions that were assigned a high quality rating compared one treatment with a different treatment. Only four out of the eight (50%) of the high quality interventions that compared one treatment with a different treatment were significant. The average effect size of the significant high quality interventions comparing one intervention with another intervention (\(n = 4\)) was small (\(d = 0.38\)).

Chapter 5

Individual Interventions

As a result of there being multiple variations of interventions used, and in order to gain a greater understanding of the interventions, the articles were grouped and are presented in the following categories: school-based interventions, sexual-abuse related trauma interventions, single-incident trauma interventions, family violence interventions, general trauma interventions, and war-related trauma interventions.
5.1 School-Based Interventions

School-based interventions were the most commonly used intervention. Twelve studies were focused on interventions delivered in a school setting. In 10 of the studies, a wait-list control was used, and in two studies a was used. The average methodological quality of the studies that were compared to a wait-list control was moderate (9.9). A statistically significant reduction in PTSS/PTSD symptoms compared to a wait-list group was reported in nine of the studies. The mean effect size for the significant interventions using a wait-list control was 0.63 ($d$), indicating moderate effectiveness. In two of the school-based interventions, a comparison group was used. The average methodological quality of the randomized clinical trial studies was moderate (8.5). There were no significant effects found in the studies with an alternate treatment. No harmful intervention effects were reported in any of the studies.

Berger and Gelkopf (2009) compared a school-based intervention (ERASE-Stress) for the treatment of tsunami-related distress in children with a wait-list religion class control. ERASE-Stress consists of psycho-educational material, skill training with meditative practices, and narrative techniques, to enhance resiliency among students experiencing stress (ERASE-Stress). Treatment took place in Sri Lanka. One-hundred and sixty-six children (aged 9-15) participated in the study. As treatment took place in the school, Berger and Gelkopf (2009) used a cluster design. Within a randomized cluster design, groups, as opposed to individuals, were randomly assigned to treatment conditions. Six classes in the current school year were randomly assigned to the ERASE-Stress intervention group and six classes from the following school year were randomly assigned to the wait-list religion class (regular study) control group. Local trained volunteers blinded to the treatment groups administered the questionnaires to the classes. Treatment consisted of twelve 90-minute sessions one a week for twelve weeks. Participants were randomized by class per age group and through a coin-toss. There were no participants who
dropped out of the study and all participants received treatment or no-treatment as assigned. Compared to the wait-list control group, the Sri Lankan children in the resiliency-focused intervention group reported a statistically significant reduction in the severity of PTSD symptoms. No follow-up tests were conducted. The quality of the study was high (10) and the effect size of the intervention was large ($d = 1.28$).

Gelkopf and Berger (2009) studied the effect of the same resiliency-focused intervention, ERASE-Stress, on reducing terror-related distress in Israeli children. One-hundred and fourteen seventh and eighth grade students participated in the study. ERASE-Stress was compared to a wait-list control group. The intervention was delivered by the student’s homeroom teacher. Treatment consisted of twelve 90-minute sessions once a week for 12 weeks. One hundred and fourteen seventh and eighth graders attending an all-male religious school were randomly assigned to either the ERASE-Stress intervention or to a wait-list control group. The method of randomization was adequately described. As the ERASE-Stress intervention took place in a school setting, Gelkopf and Berger (2009) used a cluster designed. Random assignment was generated through a coin toss. One seventh grade class was randomly assigned to receive the ERASE-Stress intervention and one seventh grade class was randomly assigned to the wait-list control group. Two eighth grade classes were randomly assigned to receive the ERASE-Stress intervention and one eighth grade class was randomly assigned to the wait-list control group. Those in the wait-list control group would receive the intervention the following school year. Since the participants all attended the same school, it is possible that some contamination between groups occurred. There were 114 students whose parents consented for the assessment, but only 107 students were actually assessed. There was no explanation given for the missing seven students’ assessments. Intent-to-treat analysis or attrition was not mentioned. After 12 weeks of the intervention, those children who received ERASE-Stress statistically significantly
reported less trauma symptoms than those children who did not receive the intervention. No follow up tests were conducted. Thus it was not possible to determine if intervention gains were maintained. The quality of the study was high (11) and the effect size of the intervention was moderate \( (d = 0.69) \).

Berger, Pat-Horenczyk, and Gelkopf (2007) conducted on a similar population of terror-related distressed Israeli children was conducted by The school that the study participants attended in Israel, was located 25 meters from the site of two recent suicide bombings. One hundred and forty-two students from ten classes (grades 3 to 6) participated in the study. The school-based intervention, “Overshadowing the Threat of Terrorism” (OTT), was compared with a wait list control. OTT is an intervention mainly consisting of cognitive–behavioral components with elements of art therapy, body-oriented strategies, and narrative approaches. The goal of the intervention is to decrease trauma symptoms in the children and enhance resiliency to the threat of ongoing terrorism. The intervention was delivered by teachers trained in the delivery of the program. OTT consists of eight 90 minute sessions. Participants were randomized through a cluster design. Five classes were randomly chosen to receive the intervention and five classes were randomly chosen to be the wait-list control. The method of randomization was not identified. Since both groups of students attended the same school, it is possible that there was some carryover effect of the intervention to the control group. Questionnaires were administered by a clinician blind to the treatment groups. No missing data were reported. Intent to treat analysis or attrition was not mentioned. Compared to the wait-list control group, the terrorism exposed children reported a reduction in trauma symptoms. The quality of the study was high (10) and the effect size of the study was large \( (d = 0.99) \).

Chemtob, Nakashima, and Hamada (2002) compared a school-based psychosocial intervention for post-disaster (two years after Hurricane Iniki in Hawaii, USA) trauma symptoms
to a wait-list control. A school-based screening was performed to identify those children (aged 6-12) who were experiencing the highest level of PTSD symptoms two years after a hurricane. Two hundred and forty-eight children (grades 2 to 6) who were identified as having high levels of PTSD were randomized into one of three treatment groups: individual, group, or wait-list control. Four trained therapists delivered therapy four times a week. Researchers developed treatment. The core components of the treatments were as follows: restoring a sense of safety, grieving losses, renewing attachments, expressing disaster-related anger, and achieving closure. Children were randomized using a random number generator in the statistically software program SPSS (Statistical Package for the Social Sciences, SPSS Inc, Chicago, Ill). There were no statistically significant differences between individual and group treatment. Treatment attrition between groups was examined. It was found that children were statistically significantly more likely to drop-out of the individual treatment than they were to drop out of the group treatment. There was no mention of intention-to-treat analysis being performed to account for the drop-outs. Overall, children in the treatment groups statistically significantly reported less trauma-related symptoms in comparison to the waitlist control. School-based psychosocial intervention was reported to effectively reduce children’s self-reported disaster-related trauma symptoms. The quality of the study was high (11) and the effect size of the intervention was large ($d = 0.76$).

At the one-year follow up of the aforementioned study, some untreated children were experiencing significant trauma associated with the disaster (Hurricane Iniki). In a field study directed towards those previously untreated trauma affected school children, Chemtob, Nakashina, and Carlson (2002) compared three sessions of EMDR to a wait-list control. In EMDR therapy, participants are asked to recall images, thoughts, and sensations. During recall, participants are directed to move their eyes (usually back and forth) by the clinician while
concentrating on the memories. EMDR was delivered by four doctoral level clinicians. For very young children, hand tapping may be substituted for eye movements. Thirty-two children (aged 6 to 12 years) were randomized into the two groups. The exact process of randomization was not described. Blinding of personnel, participants, and any other relevant individuals was not mentioned. Attrition was not addressed and intent-to-treat analysis was not mentioned.

Compared to the wait-list control group, the EMDR intervention group demonstrated a statistically significant decrease in PTSS/PTSD symptoms. The effect size of the intervention at post-test was small ($d = 0.36$). The reduction in PTSS/PTSD symptoms was maintained at the one-year follow up. The difference between the EMDR intervention group and the wait-list control group was even more pronounced at the follow up. The effect size of the EMDR group at the one year follow up was moderate ($d = 0.55$). The quality of the study was high (10).

Jaycox et al. (2009) studied the effect of a CBT-based intervention (Support for Students Exposed to Trauma or SSET) on trauma-affected children. SSET was adapted from the Cognitive-Behavioral Intervention for Trauma in Schools (CBITS). SSET consists of ten lessons approximately 45 minutes in length. The program is comprised of primarily CBT components and was compared against a wait-list control group. The pilot study was designed to examine the feasibility and applicability of the new SSET intervention. The intervention took place in urban Los Angeles (California, USA). Approximately 80% of the student population from both participating schools were eligible for free or reduced-fee lunch programs. Once parental consent was obtained, 383 students (grades 6 to 8) were screened for exposure to violence and PTSD symptoms. Children who had indicated experiencing severe violence in the past year and who had PTSD symptoms of moderate severity where included in the study. One hundred and ninety-nine students were eligible to participate in the study. A second parental consent form was sent from school to home with the children. After gaining parental consent, 78 children from two
different middle schools were randomly assigned to groups stratified by gender. The method of randomization was not adequately described. The intervention was delivered by three teachers and a school counselor. Attrition was addressed and intent-to-treat analysis was conducted. All missing values were imputed using predictive mean matching (for continuous variables) and logistic regression (for dichotomous variables) through the statistical software (Proc MI in SAS Version 9). Small reductions in trauma symptoms were statistically significantly reported among the students who were assigned to SSET. The effect size of the study at post-test was small ($d=0.46$). The statistically significant reduction of trauma symptoms in the intervention group was maintained at the six month follow up, demonstrating a small effect size ($d=0.39$). The quality of the study was moderate (9).

Jaycox et al. (2010) examined the effectiveness of individual Trauma-Focused Cognitive Behavioural Therapy (TF-CBT) compared with a group CBT school-based intervention, CBITS. TF-CBT is comprised of 12-session individual or conjoint intervention that includes child and parent. The intervention is delivered through clinics. CBITS is a 10-group session and 1–3 individual session intervention. In this field trial, 118 hurricane (Hurricane Katrina, New Orleans, Louisiana, USA) exposed children (grades 4 to 8) screened for PTSD were randomized into either a group intervention at school (CBITS) or an individual intervention at a mental health clinic (TF-CBT). The two interventions were delivered by trained therapists. Sixty participants from three different schools were allocated to the TF-CBT group and 58 participants were allocated to CBITS. The method of randomization was not described. Due to lack of parental consent and PTSD symptomology (established through the screening process) across schools, the number of participants randomized in each group across schools was uneven. Participant uptake of mental health care was also uneven across groups. Of the randomized participants, 98% began the school-based CBITS, but only 37% began the clinic-based TF-CBT.
There was differential attrition between the two treatment groups. At the time of analysis, there were 57 participants in the CBITS group but only 14 participants in the TF-CBT group. Intention to treat analysis was not mentioned. While children in both treatment groups reported significant reductions in PTSD symptoms, there was no statistically significant difference between the treatment groups. The uneven numbers of participants in each group may have resulted in the statistically insignificant difference between treatment group outcomes. In terms of feasibility and parental ease, Jaycox et al. (2010) concluded that the CBITS intervention was more accessible to families. Furthermore, the findings may have economic implications. The group treatment was found to be statistically significantly effective as the individual therapy. If group treatment can be delivered more economically than individual treatment, than it may be more feasible in economically disadvantaged areas. The quality of the study was moderate (9).

In a study conducted by Jordans et al. (2010), a classroom-based psychosocial intervention, CBI, was tested in conflict-affected Nepal. The intervention was compared to a wait-list control group. CBI is made up of components from creative-expressive therapy, experiential therapy, cooperative play, and cognitive behavioral therapy. CBI consists of fifteen 60-minute sessions for duration of five weeks. Eight schools were randomized into the two different groups (grades 2 to 8), but the randomization process was not described. As a result of using cluster sampling, blinding was not possible. The assessors went to the different schools to administer and collect the assessments and thus were aware of treatment condition. Characteristics and assessment scores of those who left the study were not addressed. Intention-to-treat analysis was not performed. No statistically significant evidence for treatment effectiveness on PTSD psychiatric variables was found. However, statistically significant treatment gains were reported for secondary intervention outcomes. An improvement of psychological difficulties, a decrease in aggression in boys, an increase in pro-social behavioural
among girls, and an increased hope for older children were found. The quality of the study was moderate (8).

Kataoka et al. (2003) examined the effects a CBT school-based mental health program on Latino immigrant children exposed to community violence. The pilot study took place in Los Angeles, California, USA. The eight-session CBT group intervention was based on Cognitive-Behavioral Intervention for Trauma in Schools (CBITS). The intervention was compared to a wait-list control group. The pilot test was conducted in Spanish and delivered by bilingual, bicultural school social workers. A total of nine schools participated in the study. Students from the nine schools were screened for community violence exposure and clinically significant symptoms of PTSD/depression at the beginning of the school year. One-hundred and ninety-eight adolescents (grades 3 to 8) were randomly assigned to either the intervention group or the wait-list control group. Sixty-seven participants received the intervention immediately and 46 students were randomized to the wait-list control group. The method of randomization was unclear. However, to ensure that students who needed mental health services received them, 85 students later in the school year were assigned to the intervention group. There were 152 participants in the intervention group and 46 participants in the wait-list control group. There were no statistically significant differences between completers and non-completers on what measure, demographic information? Outcomes? Students in the intervention group reported a statistically significant decrease in PTSD symptoms compared to those in the wait-list at the three month follow up. The quality of the CBT-based study was high (11) and the effect size of the intervention was small ($d = 0.29$).

Layne et al. (2008) compared the effectiveness of a psychoeducational school- based trauma-grief focused therapy with psychoeducational therapy. One-hundred and twenty-seven war-exposed predominantly ethnic Muslim children (aged 13 to 18 years) from Bosnia with
PTSD were assigned to either a classroom-based psychoeducation and skills intervention group with a grief focused therapy component or a treatment condition consisting of just the classroom-based psychoeducation intervention. Ten schools participated in the study. Seventeen to 20 weekly group sessions 60-90 minutes long were held at each school throughout the school year. Students reporting severe PTSD were referred to a community mental health center for more intensive treatment. The randomization process was adequately reported. The school counselors drew names of eligible students out of a box. There was no blinding of personnel, participants, or relevant others. Intent-to-treat analysis was not performed. There were no statistically significant differences between completers and non-completers on PTSD symptoms. The students who participated in the intervention group consisting of the psychoeducation intervention plus the trauma-grief focused therapy did not statistically significantly differ on symptoms of PTSD than the intervention group that received just the psychoeducation intervention. The quality of the study was moderate (8).

Stein et al. (2008) tested the effectiveness of CBT school-based mental health intervention, CBITS, for children who reported exposure to community violence. The CBT school-based mental health intervention was compared to a wait-list control group. The CBT-based intervention is composed of ten sessions delivered once a week for ten weeks. One hundred and twenty six sixth-grade students from two different schools were randomly assigned to one of two groups. Participants were randomly assigned to the groups using random numbers generated by the computer software Microsoft Excel 2001. There was no reported blinding of participants. Evaluators were also not blind to the groups. Attrition was addressed, but intention to treat analysis was not performed to account for the drop-outs. From the start of the intervention to the three-month follow-up, only seven students (out of 61 participants) dropped out of the intervention group and two students (out of 65 participants) dropped out of the wait-
list control group. Compared to the wait-list control group, children in the CBT-based intervention group reported statistically significantly less PTSD symptoms after three months of the intervention. The quality of the studies was low (7) and the effect size of the intervention was high ($d = 1.08$).

Tol et al. (2008) compared a school-based mental health group intervention for children (aged 7 to 15 years) affected by political violence in Indonesia to a wait-list control group. The intervention was comprised of 15 sessions over five weeks of trauma-processing activities, cooperative play, and creative expressive components. Given the low-income setting, the intervention was adopted as a financially feasible and accessible method of improving the mental health of children involved in complex emergencies. Through cluster sampling, seven schools were randomized to the intervention group and seven schools were randomized to the control group. Schools were randomized using the “select exact amount of cases randomization” function of SPSS version 15.0. Assessors were not blind to the treatment conditions. Blinding of assessors was not possible because assessors had to visit the schools in order to collect the assessments, which is where parents and child interviews also took place. Attrition was addressed and intent-to-treat analysis was conducted with the last observation being carried forward to represent missing outcome data. Children who took part in the group intervention reported statistically significantly fewer PTSS than children in the wait-list control group. The quality of the study was high (12) and the effect size of the intervention at one week post-test was low ($d = 0.45$). The effect size of the intervention at six weeks post-test was low ($d = 0.44$).

5.2 Sexual-Abuse Related Trauma Interventions

Interventions focused on reducing the psychological harm of sexual abuse was the second most commonly studied type of intervention. Six studies were found to focus on sexual abuse trauma interventions for children and adolescents. All six of the studies were randomized clinical
trials. The average quality of the studies was moderate (9.1). When compared against an alternate therapy, there was a statistically significant reduction in PTSS/PTSD symptoms in two of the studies. The mean effect size for the significant randomized clinical trials was moderate ($d=0.56$). In one of the studies, conducted by King et al. (2000), a three group design with two interventions and a wait-list control group was used. The intervention groups demonstrated a statistically significant reduction in PTSS/PTSD compared to a wait-list (King et al, 2000). There were no statistically significant differences between the two intervention groups. The quality of the study was moderate (8), and the mean effect size was large ($d = 0.99$). No harmful intervention effects were reported in any of the studies.

Cohen, Deblinger, Mannarino, and Steer (2004) compared TF-CBT to Child Centered Therapy (CCT) for PTSD in sexually abused children. The study took place in the US. Two hundred and ninety-nine children (aged 8-14 years) were recruited from two clinical treatment programs for abused and traumatized children. CCT is a client/parent model that emphasizes the development of trust between the client and therapist. More than 90% of the children experienced a traumatic event separate from the sexual abuse. Trained therapists delivered the intervention. Sessions were 45-minutes long and lasted for 12-weeks. The children were randomized into the two intervention groups. The randomization process was unclear. Treatment assessors were blind to the treatment conditions. Eighty-nine children who attended three TF-CBT treatment sessions completed the post-test assessment. Ninety-one children who attended at least three of the CCT treatment sessions completed the post-test assessment. There was no statistically significant different between treatment completers and non-completers. Intent to treat analysis was conducted. Pre-test variables were used to replace missing values in the post-test and follow-up scores. The children in the TF-CBT intervention group displayed statistically significantly fewer PTSD symptoms than the CCT intervention group at post-test. The effect size
of the intervention was moderate \((d=0.53)\). A follow-up study conducted by Deblinger, Mannarino, Cohen, and Steer (2006) on 183 children found that the children in the TF-CBT group had statistically significantly fewer symptoms of PTSD than the children in the CCT group at both the six-month and twelve-month follow-up. The effect size of the intervention at the six-month follow-up was small \((d = 0.33)\). The effect size of the intervention at the twelve-month follow-up was small \((d = 0.28)\). The quality of the study was high \((10)\).

Cohen and Mannarino (1998) compared Sexual Abuse-Specific CBT (SAS-CBT) to non-directive supportive therapy (NST) for sexually abused children. The study took place in the US. Eighty-two children (aged 8-15 years) were randomly assigned to either one of the two therapies. Therapy consisted of 12 sessions 45 minutes in duration. Randomization was adequately described. Children were randomized using a random number series generated through a computer. Evaluators were blind to treatment condition. There was differential attrition among groups. Thirty (out of 41) children completed SAS-CBT treatment and 19 (out of 41) children completed NST. Intent-to-treat analysis was performed to account for the missing variables. The last observation carried forward method was employed. At the six-month follow-up assessment, the SAS-CBT intervention group demonstrated statistically significantly fewer PTSD symptoms than the NST group. The effect size of the significant TF-CBT intervention at the six-month follow-up was small \((d = .40)\). Cohen, Mannarino, and Knudsen (2005) conducted a one-year follow-up study of participants. At the twelve-month follow up, the children in the SAS-CBT intervention group demonstrated statistically significantly fewer PTSD symptoms than the children in the NST group. The effect size for the SAS-CBT intervention was small at post-test \((d = .23)\), small at the six-month follow-up \((d=0.40)\), and medium at the one-year follow-up \((d = 0.50)\). The quality of the study was large \((11)\).
Deblinger, Mannarino, Cohen, Runyon, and Steer (2011) studied the effect of trauma narrative (TN) and treatment length on the effectiveness of CBT. The study took place in the US. Two hundred and ten children (aged 4-11 years) were randomly assigned to one of four treatment groups: eight therapy sessions with a trauma narrative component, 16 sessions with a trauma narrative component, eight therapy sessions without a trauma narrative component, and 16 therapy sessions without a trauma narrative component. The method of randomization was not reported. The treatment assessor was blind to the treatment conditions. Attrition from dropping out of treatment was comparable across groups. A modified intent-to-treat approach to test the effect of the missing data on the results of the statistical analysis. A computer program imputed the missing post-treatment scores based upon pre-treatment responses. SAS (a computer software program) Multiple Imputation and Multiple Imputation Analysis procedures were used by the researchers to generate ten maximum likelihood pre and post-treatment outcome scores for each outcome measure based on the pre-test scores. The maximum likelihood pre and post-treatment outcome scores did not change the results of the statistical analysis. Since the modified intent-to-treat analysis did not influence the results, investigators chose not to use intent-to-treat analysis and only use complete participant data. There was not a statistically significant difference between the treatment groups with the trauma narrative component and without the trauma narrative component on measures of PTSD symptomology. A greater number of treatments, however, did result in a statistically significant reduction of PTSD symptoms in the children. The children who received 16 sessions of treatment experienced a statistically significantly greater reduction in PTSD symptoms re-experiencing and avoidance than the children who received eight treatment sessions. The quality of the study was low (7) and the effect size for the intervention was small ($d = 0.44$).
Deblinger, Stauffer, and Steer (2001) compared the efficacy of group CBT to supportive group psychotherapy for young children who have been sexually abused. The study took place in the USA. Sixty-seven young children (ages 2 to 8) and their 44 non-offending mothers were randomly assigned to the two treatment groups. The method of randomization was adequately explained. Participants were randomized through a computer program. Attrition was addressed. There were no statistically significant differences between completers and non-completers. Intent-to-treat analysis was not performed to account for the drop-outs. Assessments were collected at 11-weeks and at 3 months after the beginning of therapy. While both treatment groups resulted in a reduction of PTSD symptoms in the children, there was not a statistically significant difference in the reduction of PTSD symptoms between the two treatment groups. The quality of the study was moderate (9).

Jaberghaderi, Greenwald, Rubin, Zand and Dolatabadi (2004) compared the effectiveness of CBT to EMDR treatment in sexually-abused Iranian girls (aged 12-13 years). Along with determining the effectiveness of CBT and EMDR components, another goal of the study was to determine which intervention was more efficient. Therapy consisted of 12 sessions of approximately 45 minutes in duration. Fourteen girls screened from a grade six Iranian school class were randomized to either the CBT or EMDR group. Using blocked randomization to help maximize equivalence among treatment groups, 16 girls were randomized to the CBT group ($n=8$) and the EMDR group ($n=8$). Both treatments were delivered during after school hours in the local university clinic by professionals. The groups did not differ statistically significantly at pre-treatment. One girl from each treatment group dropped out of treatment before the first assessment. Assessors were blind to treatment condition. Attrition was equal among groups. Girls in both treatment groups demonstrated a significant reduction in PTSD symptoms. There was no statistically significant difference between treatment groups on PTSS/PTSD symptoms.
The sample size was extremely small and there was no long-term follow-up. Jaberghaderi et al. (2004) concluded that the EMDR intervention took less time and effort than CBT, thus EMDR was the more efficient intervention. The quality of the study was high (10).

King et al. (2000) assessed the efficacy of a CBT intervention for sexually abused children (aged 5-17 years). The study took place in Australia. Thirty-six children were randomly assigned to one of three treatment conditions: child alone CBT, family CBT, or a wait-list control. Children participated in 20 weekly 50-minute sessions. In the family CBT condition, caregivers also participated in 20 weekly 50-minute sessions. The method of randomization was not adequately described. Blinding of participants, personnel, or relevant others was not mentioned by the authors. Attrition was adequately explained. Three participants dropped out of the child-alone CBT, three participants dropped out of the family CBT, and two participants dropped out of the wait-list control group (22% of the original sample). There were no significant differences between completers and non-completers. Intent-to-treat analysis was performed and baseline scores of non-completers were carried forward to post-treatment and follow up scores. The children in the CBT treatment groups, but not the wait-list control, had a statistically significant reduction in PTSD symptoms at post-test. Both treatments produced a statistically significantly reduction of symptoms when compared to the wait-list control group. The mean effect size of the CBT interventions compared to the wait-list control at post-test was large ($d = 1.19$). The difference between the CBT treatment groups and the wait-list control group was maintained at the 12-week follow up assessment ($d = .78$). There was not a statistically significant difference on PTSD symptoms between the child-alone CBT and family CBT groups. Familial involvement did not increase the effectiveness of the CBT intervention. The quality of the study was moderate (8).

5.3 Single-Incident Trauma Interventions
There were four interventions that focused on reducing the psychological harm of a single-incident traumatic event. Two of the studies involved a motor vehicle accident, one of the studies focused on a fireworks factory explosion, and one of the studies focused on general single incident trauma (motor vehicle accident, interpersonal violence, or witnessing violence). The mean quality of the studies with a wait-list control group was moderate (9.5). Two of the studies had a wait-list control and two of the studies had an alternate treatment comparison group. The mean quality of the studies using an alternate therapy as a comparison group was high (12). A statistically significant difference in PTSD symptoms between groups was found only in the two wait-list control group studies. The mean effect size of the statistically significant combined interventions was large \( (d = 1.84) \).

Kemp, Drummond, and McDermott (2009) compared the effectiveness of EMDR in reducing PTSD symptoms in Australian children to a wait-list control group. During EMDR, the participant is distracted during trauma recall by the therapist (generally through finger movements moving across the participants face). In the pilot study, twenty-seven children (aged 6 to 12 years) were randomly assigned to either the EMDR intervention group or to a wait-list control group. Twenty-seven children were randomized to the four session EMDR group \( (n=13) \) to the six-week wait-list control group \( (n=14) \). The setting of treatment delivery was not clearly described. The randomization process was not described. Besides gender (there were more girls in the wait-list group), the wait-list and the control group did not differ on any of the PTSD symptoms at pre-treatment. Attrition was not clearly addressed and no intent-to-treat analysis was performed. After six weeks, the EMDR group had statistically significantly fewer PTSD symptoms than the wait-list control group. The quality of the study was low (7) and the effect size of the intervention was large \( (d=1.20) \).
In a study comparing the effectiveness of CBT to EMDR, de Roos et al. (2011) randomized 52 children (aged 4-18 years) to either the CBT intervention group or an EMDR intervention group. Components of the CBT intervention consisted of psychoeducation, narrative exposure, cognitive restructuring, coping behaviour, and relapse prevention. In the EMDR therapy, participants were asked to recall the traumatic incident while being presented with a distracting stimulus (e.g., finger/hand tapping, the therapists finger moving back and forth in front of the participant, audio tones). Therapy consisted of four individual treatment sessions for duration of four to six weeks. The children were recruited from a disaster mental-health care setting after an explosion at a fireworks factory. Participants were from the Netherlands. The children were randomized through a coin flip. Participants were assigned to a therapist based on availability. An independent evaluator who was blind to the treatment conditions administered and collected the assessments. Intent-to-treat analysis was performed to account for missing outcome data. Missing outcome due to dropout was replaced using multiple imputations by the fully conditional specification option in SPSS 14.0. Both groups improved statistically significantly on PTSD outcomes. There was not a statistically significant difference between the two groups. The quality of the study was high (12).

Smith et al. (2007) studied the effectiveness of individual TF-CBT in reducing PTSD in children who have experienced a single-incident traumatic event. The TF-CBT in this study contained components of psychoeducation, activity scheduling/reclaiming life, reliving through images, cognitive restructuring, stimulus discrimination, nightmares relief image transformation techniques, and behavioral experiments. Treatment lasted for duration of 10-weeks. Twenty-four children (aged 8-18 years) who have been in a motor vehicle accident, experienced interpersonal violence, or who witnessed violence were randomized to either an individual CBT group or a wait-list control group. Participants were from the UK. The randomization process was
adequately described. Participants were randomized using a computer program. Assessors were blind to treatment condition. There was no differential attrition among groups and there were no drop-outs. Compared to the wait-list control group, the children in the CBT group had statistically significantly fewer PTSD symptoms at post-test. The quality of the study was high (12) and the effect size of the intervention was large ($d=2.48$).

The effectiveness of a psychological debriefing intervention compared to a neutral control group for reducing psychological harm was studied by Stallard et al. (2006). Psychological debriefing is a structure single-session trauma intervention that typically occurs between 24 and 72 hours after a potentially traumatic event. One hundred and fifty-eight children (aged 7-18) who were in a motor vehicle collision were randomised into either the psychological debriefing intervention or a control group. The study took place in the UK. Participants were randomised to either the control group or the treatment group by a researcher using numbered, sealed, opaque envelopes. The control group treatment consisted of a guided, neutral non-accident focused discussion. There were no statistically significant differences between the intervention and control group on pre-test assessment. Attrition was addressed and intent-to-treat analysis was conducted. There were no statistically significant differences between rates of PTSD in the experimental and control groups. The psychological debriefing program was not statistically significantly more effective than the neutral control group in reducing PTSD symptoms in the children. While a previous review involving psychological debriefing in adults (Van Emmerik et al., 2002) found that psychological debriefing to be potentially harmful in adults, the same effect was not found in this study on psychological debriefing in children. The quality of the study was high (12).
5.4 Family Violence Trauma Interventions

Two of the studies focused on trauma associated with familial violence. One of the studies had a wait-list control group. In a study conducted by Basu et al. (2009), the effectiveness of a group support intervention was compared to a wait-list control group. The group intervention was a parenting support group. In the women’s group, women shared their experiences with domestic violence in a group setting. The children’s component of the group focused on the expression of feeling, decreasing shame, and increasing positive behavioural skills. The study took place in the USA over a 10-week time period. Twenty children (aged 3 to 12 years) and thirty-six mothers were randomized to either the community-based psycho-education group intervention or a wait-list control group. The randomization process was not described. Evaluators were blind to treatment condition. There was high attrition among treatment groups, with only ten out of 19 children completing treatment. Approximately half of the children enrolled within the study did not complete treatment. Intent-to-treat analysis was not performed. The number of participants in each group was uneven. From pre-test to the end of the study, 19 mothers and 8 pre-schoolers did not complete assessment. Analysis was conducted with the inclusion of an early termination group. Participants were split into completers and those attending at least four sessions. There were no statistically significant differences in PTSD symptoms between the treatment group and the control group. Children in the control group demonstrated statistically significantly fewer symptoms of anxiety and depression when compared to the children in the group intervention. It is possible that the group intervention had a harmful effect on the children in the study. However, high attrition and poor study quality significantly limit the results of the study. The quality of the study was low (6).

Cohen, Mannarino, and Iyengar (2011) compared the effectiveness of TF-CBT and CCT (Child Centered Therapy) in reducing PTSD in children exposed to intimate partner violence.
(IPV). The treatment took place at a women’s center and shelter. CCT is the treatment generally used by the center, with the restoration of interpersonal trust and empowerment as its focus. The TF-CBT used in this study is a cognitive behavioural therapy consisting of psychoeducation, relaxation skills, expressing and modulating upsetting feelings, increasing coping skills, developing a narrative, correcting maladaptive cognitions, and enhancing feelings of safety. The study took place in the USA. Treatment consisted of eight 45-minute sessions. One hundred and twenty four children (aged 7-14 years) were randomized into the two intervention groups. Participants were randomized using a computer generated random number series. Evaluators were blind to treatment condition. Seventeen participants dropped out during TF-CBT treatment and 14 participants dropped out of the CCT treatment. Intent-to-treat analysis was carried out using the last observation carried forward. Compared to the CCT treatment, children in the TF-CBT treatment group had statistically significantly fewer PTSD symptoms at post-intervention. The quality of the study was moderate (8). The effect size of the intervention was small ($d = 0.25$).

5.5 Interventions for Refugee Children and Adolescents

Two interventions were directed towards refugee children. One of the interventions used a wait-list control. Ruf et al. (2010) tested the effectiveness of a Narrative Exposure Therapy aimed at reducing psychological harm in children, KIDNET, against a wait-list control group. Narrative exposure therapy is particularly beneficial in cases where individuals are suffering from repeated exposure to a variety of traumatic events. Narrative exposure therapy allows clients to create a narrative with the therapist focusing on a whole life story as opposed to a specific event. Narrative exposure therapy was adapted into a manualized intervention for children and tested in the study. The therapy is comprised of eight sessions 90-120 minutes in duration. Twenty-six refugee children (aged 7 to 16 years), living in Germany, were randomly
assigned to either the intervention group \((n = 13)\) or to a wait-list control \((n = 13)\). Permutated blocking was used to randomize the children into the two groups. Assessors were blind to the treatment conditions. One participant dropped out of the KIDNET treatment group during treatment. Intent-to-treat analysis was conducted, but what kind of intent-to-treat analysis was conducted was not specified. Investigators, however, did mention that there was no statistically significant differences between the intent-to-treat analysis and the treatment-completer analysis. As a result, only treatment completer analysis was presented. The children in the KIDNET group had significantly fewer PTSD symptoms at the six-month follow-up than the children in the wait-list control group. The quality of the article was high (10) and the effect size of the intervention was large \((d = 1.03)\).

Catani et al. (2009) tested the effectiveness of the same narrative exposure therapy intervention KIDNET on reducing the psychological impact of war and tsunami in children. KIDNET was compared to a meditation-relaxation therapy, MED-RELAX. The study was conducted in Sri Lanka. KIDNET is a type of narrative therapy created for use with children. Through narrative therapy, a life story of the trauma affected individual is created by the individual with the assistance of a therapist. Meditation-relaxation therapy was chosen as a comparison condition because meditation-relaxation techniques are well known to children and counselors in the area. Each intervention was comprised of six sessions each. Thirty-one refugee children (aged 8-14 years) were randomly assigned to either the KIDNET group or the MED-RELAX group. Children were randomized using a coin flip procedure. Assessors were blind to participant treatment condition. There were no drop-outs during treatment, but one participant was lost to follow-up. The authors planned to perform last-observation carried-forward intent-to-treat analysis, but as there was only one case missing, there was no difference in results between analysis strategies. There was not a statistically significant difference on PTSD measures
between the two treatment groups. Both groups had improved statistically significantly on PTSD symptoms at the six-month follow up. Eighty-one percent of the children in the KIDNET group improved at the six-month follow-up, while 71% of the children in the MED-RELAX group improved. The quality of the study was high (12).

5.6 Child Maltreatment Interventions

There was one intervention that was directed at alleviating psychological harm in maltreated children. Farkas, Cyr, Lebeau, and Lemay (2010) compared the effectiveness of motivation-adaptive skills-trauma resolution/eye movement desensitization and reprocessing (MASTR/EMDR) to a routine care condition. MASTR is a trauma-focused treatment used in youth with conduct problems. MASTR contains components of motivational interviewing, cognitive-behavioral training, coping skills development, trauma resolution, relapse prevention, and harm reduction. EMDR uses eye movements to encourage the brain to forge new memory connections in an effort alleviate trauma symptoms. The authors adapted an intervention containing both therapy components to alleviate psychological harm in maltreated children. MASTR/EMDR therapy was delivered for 12 sessions for 12 weeks. Eighty adolescents (aged 13 to 17 years) in Youth Protective Services in Canada were randomly assigned to receive either the MASTR/EMDR therapy or the routine treatment. The method of randomization was not clearly reported. There were 33 participants enrolled in the MASTR/EMDR therapy group and 32 participants enrolled in the routine treatment group. Assessors were blind to treatment group. Fifteen adolescents dropped out of the study at post-treatment (ten participants-30.3%-dropped out of the treatment group and five participants-15.63%-dropped out of the routine care treatment group). Eight participants dropped out of the study at the three-month follow-up (two participants from the MASTR/EMDR group and six participants from the routine care group). Intent-to-treat analysis was not performed. There was differential attrition at post-intervention
and analysis was not performed to account for the difference. The MASTR/EMDR therapy group had statistically significantly fewer PTSD symptoms than the routine care group. After twelve weeks of therapy, the effect size of the MASTR/EMDR intervention compared to routine care was small ($d = 0.42$). At the three-month follow-up, the intervention effect was maintained ($d = 0.37$). The quality of the study was moderate (9).

**5.7 Unspecified Trauma Interventions**

There were six remaining studies that were focused on general or unspecified trauma in children and adolescents. In four of the studies, the intervention was compared against a wait-list control group. A statistically significant reduction in PTSD symptoms was reported in all four of the studies. One of the studies, however, did not contain enough information to compute effect size. The average effect size of the remaining three significant randomized control trials was large ($d = 1.00$). In two of the studies, an intervention comparison group was used. The average quality of the randomized clinical trials was moderate (9). The effect size of these studies was large ($d = 1.06$).

Ahmad, Larsson, and Sundelin-Wahlsten (2007) assessed the effectiveness of EMDR compared to a wait-list control in reducing symptoms of PTSD in children. EMDR consists of eye movements initiated by a therapist during sensation memory recall of the traumatic event. In the study, eye movements were replaced by tapping where necessary. The children’s emotional states during therapy were examined using face-figures. Thirty-three children (aged 6-16 years) residing in Sweden were randomized to either the EMDR intervention group ($n = 17$) or to a wait-list control group ($n = 16$). The intervention was comprised of eight weekly sessions. The randomization process was not described. Assessments were conducted by an independent evaluator blind to treatment condition. Attrition was described: three children who received less than three treatment sessions were considered drop-outs. Linear regression analysis was used to
input the missing outcomes. Intent-to-treat analysis on the non-completers demonstrated no statistically significant differences on any of the outcomes compared to completers. At post-treatment, the PTSD scores of children in the EMDR group were statistically significantly lower than the scores for the wait-list control group. The quality of the study was moderate (9), and the effect size of the intervention was moderate \( (d = 0.69) \).

Ahrens and Rexford (2002) studied the effectiveness of cognitive processing therapy (CPT) on reducing self-reported PTSD symptoms in incarcerated adolescents. CPT is based on three components: education about PTSD symptoms and information processing theory, exposure, and cognitive therapy. Participants received eight sixty-minute sessions of therapy. The study took place in the USA. Thirty-eight adolescent males (aged 15-18 years) incarcerated in a youth facility for adolescent offenders were randomized to either the CPT intervention group \( (n=19) \) or the wait-list control group \( (n=19) \). The process of randomization was not adequately described. Blinding was not used. As treatment took place in a facility for incarcerated adolescents, there were no drop outs. No intent-to-treat analysis was performed. The youth in the CPT group reported statistically significantly fewer PTSD symptoms than the wait-list control at post-test. The quality of the study was low (6), and the effect size of the intervention was high \( (d = 1.23) \); though, the ES must be interpreted with caution given the low methodological quality.

In a pilot study conducted by Berkowitz, Stover, and Marans (2011), a caregiver-child intervention, the Child and Family Traumatic Stress Intervention (CFTSI), was compared to a supportive counselling and psychoeducation intervention. The focus of CFTSI is to decrease risk factors of poor social or familial support and poor coping skills by increasing communication between children and caregivers and increasing coping skills. CFTSI is a four session treatment, with each session lasting between 1-1 ½ hours. The study took place in the USA. One-hundred and twelve children (aged 7-17 years) who had experienced a traumatic event were randomized
to the two treatment conditions. The randomization process was unclear. There were 106 children eligible for the study. Fifty-three participants were randomized to the CFTSI intervention and 53 participants were randomized to the comparison condition. Assessors were not blind to treatment condition. There was no differential attrition between the two intervention groups. The groups did not differ statistically significantly on any characteristic at base-line. There were no statistically significant differences between completers and non-completers. Imputation to account for missing variables was not used in the study. At the post-test, children in the CFSTI group had statistically significantly fewer PTSD diagnoses than the children in the comparison intervention. The effect size for the intervention at post-test was large ($d = 2.33$). At the three-month follow-up, children in the CFSTI group had fewer PTSD diagnoses than the comparison group. The effect size for the intervention at the three-month follow-up was large ($d = 1.80$). The quality of the study was low (7).

Gilboa-Schechtman et al. (2010) examined the efficacy of developmentally adapted prolonged exposure therapy for adolescents (PE-A) compared with time-limited dynamic therapy (TLDP-A) for decreasing PTSD symptoms in adolescents. PE-A is a specific adolescent aimed type of therapy that involves components of exposure therapy, psychoeducation, case-management, and relapse preventions. TLDP is a form of brief dynamic therapy in which the focus is to change patterns of inter- and intra-personal relatedness. PE-A consists of 12 to 15 weekly sessions of 60 to 90 minutes duration. TLDP consists of 15 to 18 50-minute sessions. The study was conducted in Israel. Thirty-eight single-event adolescent trauma survivors (aged 13-18 years) were randomized to either the PE-A intervention or the TLDP-A intervention. Thirty-eight participants were randomized to the PE-A condition ($n = 19$) and to the TLDP-A condition ($n = 19$). Adolescents were randomized using a block randomization method (with a block size of six). Fifteen adolescents in each group completed treatment. Assessors were blind to treatment
condition. Compared to the adolescents in the TLDP-A intervention, there were statistically significantly fewer PTSD symptoms in the adolescents in the PE-A group at post-intervention, and the effect size was small ($d = 0.45$). The results were maintained at the six-month follow-up assessment ($d = 0.54$) and the 17-month follow-up ($d = 0.21$). The overall quality of the study was high (11).

Raider et al. (2008) studied the effectiveness of a Structured Sensory Therapy (SITCAP-ART) on reducing PTSD symptoms in traumatized adolescents in residential treatment. SITCAP-ART was compared to a wait-list control group. SITCAP-ART is an art-based therapy relying upon the senses to work through traumatic experiences. The study took place in the USA. The program consists of approximately 10-11 sessions over the course of eight to ten weeks. Twenty-three adolescents (aged 15-18) who were accessing residential treatment were randomized to either the SITCAP-ART therapy or the wait-list control group. Twenty-three participants were randomized into the treatment group ($n=13$) and to the waitlist control group ($n=10$). The process of randomization was not explained. Drop-outs were addressed. Raider et al. (2008) suggested that the SITCAP-ART intervention dropouts may have been experiencing fewer trauma symptoms than those who completed the intervention. Raider et al. (2008) found that the adolescents in the SITCAP-ART group had statistically significantly fewer PTSD symptoms than the adolescents in the wait-list control group. Unfortunately, there was not enough information provided in the study to calculate the effect size of the intervention. Further statistical analysis is needed to determine the effectiveness of SITCAP-ART. The overall quality of the study was moderate (9).

The last examined study was focused on the effectiveness of TF-CBT in reducing PTSD in three to six year old children. Scheeringa, Weems, Cohen, Amaya-Jackson, and Guthrie (2011) compared TF-CBT to a wait-list control group. The TF-CBT intervention included
psychoeducation, recognition of feelings, training in coping skills, exposure to trauma reminders through art, and safety planning techniques. The intervention consisted of 12-sessions over the course of 12 weeks and took place in the USA. Sixty-four children were randomly assigned to either a TF-CBT group \((n = 40)\) or to a wait-list control group \((n = 24)\). Children were randomized using a blocked randomization procedure in blocks of four (two participants randomly assigned to the intervention and two participants randomized to the wait-list control group). Attrition was high in the study. Only 19 children (52.5%) from the intervention group and 11 children (54%) from the wait-list control group completed assessment post-intervention. There were only six participants in the intervention group and twenty participants in the wait-list control group who completed the six-month follow-up. Scheeringa et al. (2011) suggest that attrition may be high in the study as a result of the age of participants. Externalizing behaviour of younger children may be less extreme, and since the verbal skills of many young children are limited internalizing behaviours may be less verbalized. Thus, parents may feel less motivated to take their children to appointments. There were no statistically significant differences between treatment completers and non-completers. The children in the TF-CBT group had statistically significantly fewer PTSD symptoms at post-test than the children in the wait-list control group at post-test. The quality of the study was low (5) and the effect size of the intervention was high \((d = 1.03)\). Due to the extremely high attrition in the study and the resulting low methodological quality, any conclusions about effectiveness should be interpreted with caution.

**Chapter 6**

**Discussion**

Within the past decade, there have been many advances in the treatment of children and adolescents who have been exposed to trauma. The current systematic review and meta-analysis
identified thirty-three different studies aimed at alleviating traumatic stress symptoms in children and adolescents. This is the only current study that takes into account quality of the study when examining intervention effectiveness. The implications of this study, both for practice and research, are discussed below.

6.1 Implications for Practice

From this review, there appears to be some evidence supporting school-based interventions. Twelve of the identified interventions were school-based (See Berger & Gelkopf, 2009; Berger et al., 2007; Chemtob et al., 2002; Chemtob et al., 2002; Gelkopf & Berger, 2009; Jaycox et al., 2009; Jaycox et al., 2010; Jordans et al., 2010; Kataoka et al., 2003; Layne et al., 2008; Stein et al., 2003; Tol et al., 2008). While school-based interventions were found to be only moderately effective; in terms of efficacy and efficiency school-based interventions have many benefits. As found in this review, attrition was low in the majority of the school-based studies. Delivering an intervention in a school setting may place fewer burdens on families. Families, who may be displaced from their homes or are otherwise overburdened, do not have to bring the child to treatment if they are receiving care at school. Caregivers may even be unaware of the trauma or focused on fulfilling the basic needs of the family (e.g., shelter, food, warmth). School-based interventions can also target populations in need. Children and adolescents affected by a community-wide traumatic event (e.g., hurricane or flood) could be located by targeting a school within range of the traumatic event. For example, when a tsunami hit the coast of Sri Lanka leaving thousands dead, Berger and Gelkopf (2009) implemented a school-based intervention targeting 166 students with significant tsunami exposure. Since the majority of children already attend school, school-based interventions are accessible to a wide range of trauma-exposed children and adolescents. Furthermore, as long as they attend school, children and adolescents from poorer areas, as well as minority children have equal opportunity to access
treatment. Unfortunately, not every child can attend school. School-based interventions may not be as useful in some poverty-stricken countries, where children do not have access to schooling. In the case of poverty-stricken areas, the children who cannot attend school may also be those who need treatment the most (e.g., the children who were in the main zone of exposure may have sustained injuries or may have been orphaned by the traumatic event).

There were very few studies comparing school-based intervention to an alternative treatment. Only three studies had an alternative treatment as a comparison group (See Chemtob et al., 2002; Jaycox et al., 2010; Layne et al., 2010). None of the school-based interventions was more effective at reducing PTSD symptoms than the alternative treatment. As such, it is not possible to determine if the reduction in PTSS/PTSD symptoms were specific to the school-based intervention components, or if considering the accessibility of the school-based intervention, the reduction was a result of children accessing treatment.

Sexual-abuse related trauma interventions on reducing PTSS/PTSD symptoms demonstrated some evidence for effectiveness. Six interventions were found to focus on sexual abuse trauma interventions for children and adolescents (See Cohen & Mannarino, 1998; Cohen et al., 2004; Cohen et al., 2005; Deblinger et al., 2001; Deblinger et al., 2006; Deblinger et al., 2011; Jaberghaderi et al., 2004; King et al., 2000). In all the sexual-abuse related trauma studies, the sexual-abused focused intervention was compared against an alternative treatment. TF-CBT was the only therapy studied that demonstrated effectiveness when compared to an alternative therapy. CBT was more effective at reducing PTSS/PTSD symptoms in comparison to Client-Centered Therapy (CCT) and non-directive supportive therapy (NST; See Cohen & Mannarino, 1998; Cohen et al., 2004; Cohen et al., 2005; Deblinger et al., 2006). Both of the interventions were of high quality (10.5). The effectiveness of TF-CBT was maintained for up to one-year following completion of therapy within both of the studies. The findings provide some evidence
that TF-CBT is effective over other types of treatment, but without further evidence demonstrating the effectiveness of TF-CBT over alternate therapies it cannot be concluded that TF-CBT is the most effective. More studies comparing TF-CBT therapy to alternative treatments may be needed.

There was mixed evidence on the effectiveness of studies focused on reducing PTSD symptoms in children and adolescent survivors of single-trauma incidences. While both CBT and EMDR showed some promise in reducing PTSD/PTSS in children and adolescents exposed to single-incident trauma, the single-incident trauma interventions that were compared to an alternative intervention did not result in a significant reduction PTSD symptoms single incident trauma (See de Roos et al., 2011; Kemp et al., 2009; Smith et al., 2007; Stallard et al., 2006). The children and adolescents who were treated with psychological debriefing following a single incident did not improve over children who did not receive therapy (See Stallard et al., 2006).

The evidence for the effectiveness interventions directed towards familial violence and refugees was not strong. There were two studies that focused on familial violence (See Basu et al., 2009 & Cohen et al., 2011) and two studies that were directed towards refugee children (See Catani et al., 2009 & Ruf et al., 2010). One of the studies on children exposed to intimate partner violence showed the TF-CBT was better at reducing PTSD symptoms than the alternative treatment, CCT (See Cohen et al., 2011). Conversely, a longitudinal study conducted on children and adolescents who have been exposed to domestic violence found that group supportive therapy had no impact PTSD symptoms in the children (See Basu et al., 2009). There were, however, other positive effects of the therapy (especially on the mother). Of the studies on refugee and war traumatized children, one of the studies tested the effectiveness of a type of narrative exposure therapy called KIDNET (See Catani et al., 2009). The effectiveness of KIDNET was mixed (See Catani et al., 2009 & Ruf et al., 2010). Compared to a wait-list control
group, KIDNET was more effective than the control at reducing PTSD symptoms, but when compared to a meditation-relaxation therapy (MED-RELAX), the KIDNET group did not demonstrate fewer PTSD symptoms (Catani et al., 2009). There was only one study focusing on treating maltreated children (See Farkas et al., 2010). The intervention MASTR/EMDR was more effective than routine treatment at reducing symptoms of PTSD in trauma affected adolescents. As this was only one study, it is difficult to assess the true effectiveness of the outcome.

Studies that focused on general trauma fared better than the studies that focused on a specific type of trauma (See Ahamd et al., 2007; Ahrens & Rexford, 2002; Berkowitz et al., 2011; Gilboa-Schechtman et al., 2010; Raider et al., 2008; Scheeringa et al., 2011). All of the interventions compared to a wait-list control group demonstrated a significant reduction in PTSD symptoms (See Ahmad et al., 2007; Ahrens & Rexford, 2002; Raider et al., 2008; Scheeringa et al., 2011). There were, however, only two studies that assessed the general trauma intervention against an alternative treatment (See Berkowitz et al., 2011 & Gilboa-Schechtman et al., 2010). The exposure therapy intervention was more effective at reducing PTSD symptoms in children than time-limited dynamic therapy intervention (See Gilboa-Schechtman et al., 2010). The child and family stress intervention was also more effective at reducing PTSD symptoms in children than a routine care condition (See Berkowitz et al., 2011). However, since there are only a few interventions that are compared with an alternate intervention, it may not be possible to determine the true effectiveness of these therapies.

At this time, there is no clear evidence for the effectiveness of one treatment compared to another. It is important for mental health professionals to be informed of advances in assessment and treatment methods. In order for practitioners to use the best available evidence in their practice, reliable evidence must be accessible. The impact of the lack of reliable evidence on the
mental health of trauma affected children and adolescents may be profound. While none of the treatments in this study were shown to have any harmful effects on children and adolescents, it is possible that some treatments do cause harm that was either not measured or not reported.

6.2 Implications for Research

Through this study evidence to suggest the effectiveness of therapy when compared against a wait-list control was found. The majority of therapies compared against a wait-list were found to be more effective than the wait-list control (15 out of 17 therapies; See Ahmad et al., 2007; Ahrens & Rexford, 2002; Berger & Gelkopf, 2009; Berger et al., 2007; Chemtob et al., 2002; Gelkopf & Berger, 2009; Jaycox et al., 2009; Kataoka et al., 2003; Kemp et al., 2009; Raider et al., 2008; Ruf et al., 2010; Scheeringa et al., 2011; Smith et al., 2007; Stein et al., 2003; Tol et al., 2008). Clinical equipoise, a term coined by Freedman (1987), is an ethical principal in clinical research in which there is “a state of genuine uncertainty on the part of the clinical investigator regarding the therapeutic merits of each arm in a trial” (p. 141). In randomized control and clinical trials, investigators may ethically randomly assign participants to treatment groups if clinical equipoise exists (Miller & Joffe, 2011). If there is clinical equipoise investigators are not knowingly giving participants inferior treatment, and thus are able to remain “ethical” (Miller & Joffe, 2011). The principle of equipoise further dictates that, consistent with ethical practice, investigators are obligated to treatment if the treatment is confirmed to be of superior therapeutic merit (Freedman, 1987). If therapy (regardless of type) is more effective at reducing PTSD/PTSS in children and adolescents, then would it be ethical to continue to use a wait-list control group? Given the evidence for effectiveness of the therapies compared with a wait-list control found within this review, future researchers may choose to compare one therapy to another therapy and not have a wait-list control condition.
However, coming to a decision regarding intervention effectiveness was problematic due to lack of necessary information regarding methodological quality. It was often unclear if a major investigative component, such as blinding, was present in the study. If the methodological quality of a study is low (as a result of lack of reporting) and the effect size of the intervention in that study is large, there may be less confidence in the large effect size as a result of low methodological quality. In fact, there was a relationship evident in this study; studies with low methodological quality appeared to have inflated ES which results in very little confidence in the findings. As previously mentioned, in order to make accurate conclusions about intervention effectiveness, all components necessary to arrive at that decision must be accessible. It is important that researchers report each and every step of their process. Journal editors may help improve reporting by having better reporting requirements. Journal editors control not only what studies are published but how studies are published. If journal editors make transparency and reporting of research methods a requirement of publication, then there may be more reporting. This study was limited due to limited reporting in the research articles.

Researchers may help improve the dependability of research by improving the quality of the research design, the research process, and the reporting of research. The Cochrane Collaboration Tool for Assessing Risk of Bias is scored on the basis of the generation of allocation sequence (the procedure used to obtain the sequence for making intervention assignments); allocation concealment; blinding of participants, personnel, and outcome assessors; incomplete outcome data; selective outcome reporting; and other threats to validity (determined by the judgement of the scorer). Researchers may improve the trustworthiness of their research by minimizing small errors in study design (e.g., small sample sizes) and increasing the quality of the reporting (e.g., randomization process and reasons for drop-outs). Future investigators may also improve the dependability of research by utilizing the most valid
and reliable measures of PTSD symptoms. While the Cochrane Collaboration Tool for Assessing Risk of Bias does account for uncertainty in reporting, a lack of reporting could greatly influence quality rating score. While all of the included studies in this analysis report a component of randomization, only about half of the studies actually report the randomization method (51%). This lack of reporting makes it difficult to assess the quality of studies.

Without available high quality research, it is not possible to determine the effectiveness of interventions and treatments directed towards alleviating PTSD/PTSS symptoms in children and adolescents who have been exposed to trauma. Seven (21%) of the 33 studies included in this review were of poor methodological quality and 9 were of moderate quality. The low number of high quality research in child and adolescent trauma-focus research could be preventing children and adolescents from receiving high quality treatment. In order to further increase the understanding of therapies there should be a greater availability of high quality treatments.

Future research should aim to examine the transferability, accessibility, and effectiveness of treatment in different cultures. The majority of the identified studies took place in the USA (48%). While these studies add to trauma focused scholarship, it is also important to examine the effects of interventions on people in other countries and experiencing different cultures. Different countries and cultures may have different research practice and/or requirements, different ethical procedures, or different ethical procedures. For example, Jaberghaderi et al. (2004) described many barriers to treatment that were encountered in Iran. The study, conducted by Jaberghaderi et al. (2002), was directed towards alleviating trauma symptoms in adolescent girls who have been sexually abused. There were no formal review boards or ethics committees in Iranian universities, so the authors had to discuss elements of the study with respected colleagues to ensure ethical and scientific standards were met. Cultural
variations and beliefs may also impact the uptake of interventions in different cultures.

Jaberghaderi et al. (2004) explained that there was enormous stigma in Iran associated with sexual abuse. It was a concern of the researchers that participants would be unwilling to participate in the study out of fear for their safety. It was important that the girls who participated in the study were not subject to ostracism and further abuse as a result of participation in the study. To minimize the risk to participants, researchers presented the study to parents and peers as a study on trauma, with the type of trauma left unspecified. Those parents who were judged by the primary investigator to be open-minded and supportive were further told the true focus of the study. The authors explained that the decision to present the study as directed towards unspecified trauma caused controversy among the cross-cultural research team. The team eventually came to the conclusion that that “specific procedures designed to protect participants have to be culturally sensitive and take local conditions into consideration” (Jaberghaderi et al., 2004, pp. 11). The study conducted by Jaberghaderi et al. (2004) is an illustration of the influence of culture on barriers to accessing treatment. Research on interventions that take place in other cultures/countries can improve cultural sensitivity in practitioners.

6.3 Limitations

There were some limitations in the study. A meta-analysis relies on subjective judgements regarding study inclusion and these judgements may affect study selection (Field & Wright, 2006). While the author had significant training in identifying relevant research, nevertheless selection error may still have occurred. The electronic search had yielded 1,475 results. While a systematic approach to selection was employed, it is still possible that there were errors made in the selection process. In order to limit study selection bias, a second reviewer was used to select studies to include in the analysis. Percentage of agreement between reviewers was
calculated to account for any differences in study selection between reviewers. Study selection bias is a common limitation of meta-analyses.

A similar difficulty involving subjective judgements of the authors are related to the assessment tool used to assess methodological quality. The Cochrane Collaboration Risk of Bias Assessment tool is a qualitative assessment tool requiring subjective judgement. The reviewer is intended to go through each category of the tool and highlight the areas of bias that would have the most impact on the results of the specific study. The results of the analysis are based on the judgements of the reviewer. In order to account for this subjectivity, two reviewers independently assessed each included article for methodological quality. The application of the methodological quality tool was decided upon through consensus of the two reviewers. Multiple reviewers assessing methodological quality may decrease errors.

Another limitation of this study is in the scope of outcomes assessed. There were approximately 120 different outcomes measured in the 33 interventions focusing on secondary trauma-related symptoms. Secondary outcomes included depression, anxiety, externalizing disorders, attention-deficit disorder, oppositional defiant disorder, and many others. In an effort to be thorough, those secondary outcomes were not assessed in the current study. The outcomes on family members (e.g., the mother or a non-offending caregiver) enrolled in the study were also not included in the review. The study of secondary outcomes might have been particularly beneficial for studies in which there was not a statistically significant effect for PTSD/PTSS, but there was a statistically significant effect for secondary outcomes. Future systematic reviews and meta-analyses may be designed to examine other benefits and harms of trauma focused interventions specifically aimed at children and adolescents.

Only studies published in the English language were included in the review and subsequent meta-analysis. Only including English language studies may be problematic because
many important studies published in a language other than English may exist but were not included. Included in this systematic review were interventions delivered in countries where English would not be the first language of many of the participants. Important ideas may be lost in translation to English. Studies conducted and published in a language that is not English may influence the results of the review and meta-analysis.

Another limitation with this study is that it was only focused on published research. Rosenthal (1979) coined the term “file-drawer problem” to describe the tendency of journal editors to only publish significant results. Studies that are being published are, in actuality, only a small fraction of the studies that are being carried out. Rosenthal (1979) stated that the “extreme view of this problem, the “file drawer problem,” is that the journals are filled with the 5% of the studies that show Type I errors, while the file drawers back at the lab are filled with the 95% of the studies that show non-significant (e.g., p > .05) results” (p. 638). The omission of unpublished research may result in erroneous statistical conclusions.

Chapter 7

Conclusion

This is the most recent meta-analysis and systematic review on the effectiveness of psychosocial interventions directed towards alleviating PTSD/PTSS symptoms in children and adolescents that takes into account methodological quality. Taking into account methodological quality, school-based interventions, sexual abuse related trauma interventions, and CBT therapy demonstrated some degree of effectiveness. Due to lack of reporting and high attrition, it may be beneficial to examine these types of therapies further. Other study outcomes (such as depression and conduct disorder) may also be examined to increase understanding of the effects of the interventions on these outcomes.
Traumatic exposure can have serious, negative, long-lasting effects on children and adolescents. A traumatic event may cause lasting, prolonged negative effects on a child or adolescent. There are many types of psychosocial interventions available for use in child and adolescents who have PTSD or PTSS. Because there are so many different types of treatments used in different settings and for different types of trauma, there is uncertainty regarding effective treatment. It is important to consider methodological quality when determining intervention effectiveness. Methodological quality may influence study effects. While approximately half of the studies examined were of high quality, the remaining half were of low to moderate quality. Until researchers increase reporting and journal editors become stricter on reporting, there may remain uncertainty regarding effective psychosocial interventions to reduce psychological symptoms in children and adolescents who have experienced trauma.

Overall, the majority of interventions compared against a wait-list control group produced positive results. This finding is particularly meaningful considering that the interventions were directed towards a potentially vulnerable population. However, there was not enough evidence to come to any conclusions regarding the effectiveness of one therapy over another. Further studies examining the effectiveness of psychosocial intervention in reducing trauma symptoms in children and adolescents while taking into account methodological quality and compared to an alternate therapy would be beneficial. This systematic review and meta-analysis focuses on the research that has been conducted on treating child and adolescent PTSD, and thus highlights what work needs to be done so that child and adolescent PTSD can most effectively be treated.
References marked with an asterisk indicate studies included in the meta-analysis.


Child Psychology and Psychiatry, 52(6), 676-685.


Mental Health Correlates. Charleston: Medical University of South Carolina, National Crime Victims Research and Treatment Center.


McGuire, J. (2010). *Chronic variable stress as a rodent model of PTSD; A potential role for neuropeptide Y (NPY).* University of Cincinnati. *ProQuest Dissertations and Theses*, 176.


Figure 1. Systematic search flow-diagram
### Table 1

*Study Characteristics, Results, Quality Rating Assessment, and Effect Sizes (d)*

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Research Design</th>
<th>Intervention</th>
<th>Trauma</th>
<th>Reported Result</th>
<th>ES(d)</th>
<th>QRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmad et al. (2007)</td>
<td>Control</td>
<td>EMDR</td>
<td>Unspecified</td>
<td>SS</td>
<td>0.69</td>
<td>9</td>
</tr>
<tr>
<td>Ahrens &amp; Rexford (2002)</td>
<td>Control</td>
<td>CPT</td>
<td>Unspecified Trauma</td>
<td>SS</td>
<td>1.23</td>
<td>6</td>
</tr>
<tr>
<td>Basu et al. (2009)</td>
<td>Control</td>
<td>I- Psychoeducational Group Therapy</td>
<td>Familial Violence</td>
<td>NS</td>
<td>NA</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C- Wait-list</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C- Early Termination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berger &amp; Gelkopf (2009)</td>
<td>Control</td>
<td>School- Based Resiliency Focused</td>
<td>Natural Disaster</td>
<td>SS</td>
<td>1.28</td>
<td>10</td>
</tr>
<tr>
<td>Berger et al. (2007)</td>
<td>Control</td>
<td>School-Based CBT</td>
<td>Terrorism</td>
<td>SS</td>
<td>0.99</td>
<td>10</td>
</tr>
<tr>
<td>Berkowitz et al. (2011)</td>
<td>Clinical</td>
<td>I- Family-Focused C- Psychoeducational</td>
<td>Unspecified Trauma</td>
<td>SS</td>
<td>2.33 at post-test; 1.80 at 3 mntths</td>
<td>7</td>
</tr>
</tbody>
</table>

*Note.* CBT= Cognitive-Behavioural Therapy; EMDR= Eye Movement Desensitization and Reprocessing; ES= Effect Size; mntths= Months; NA= Not Applicable; NS= Not Significant; QRA= Quality Rating Assessment; SS= Statistically Significant
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Research Design</th>
<th>Intervention</th>
<th>Trauma</th>
<th>Reported Result</th>
<th>ES(d)</th>
<th>QRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catani et al. (2009)</td>
<td>Clinical</td>
<td>I- Narrative Exposure Therapy C- Meditation- Relaxation Therapy</td>
<td>Natural Disaster (Tsunami) and War Exposure</td>
<td>NS</td>
<td>NA</td>
<td>12</td>
</tr>
<tr>
<td>Chemtob et al. (2002)</td>
<td>Control</td>
<td>School-Based EMDR</td>
<td>Natural Disaster</td>
<td>SS</td>
<td>0.36 at 1 mnth; 0.55 at 6 mnth</td>
<td>10</td>
</tr>
<tr>
<td>Chemtob et al. (2002)</td>
<td>Clinical</td>
<td>I- School-Based Group Treatment I- School- Based Individual Treatment C- Wait-list</td>
<td>Natural Disaster</td>
<td>SS</td>
<td>0.76</td>
<td>11</td>
</tr>
<tr>
<td>Cohen &amp; Mannarino (1998)</td>
<td>Clinical</td>
<td>I- SAS-CBT C- Routine Treatment</td>
<td>Sexual Abuse</td>
<td>SS</td>
<td>0.23 at post-test; 0.40 at 6 mnth; 0.50 at 12 mnth</td>
<td>11</td>
</tr>
<tr>
<td>Cohen et al. (2005)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Note. ES= Effect Size; mnths= Months; Not Applicable; NS= Not Significant; QRA= Quality Rating Assessment; SAS-CBT= Sexual-Abuse Specific Cognitive Behavioural Therapy, SS= Statistically Significant
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Research Design</th>
<th>Intervention</th>
<th>Trauma</th>
<th>Reported Result</th>
<th>ES((d))</th>
<th>QRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohen et al. (2004)</td>
<td>Clinical</td>
<td>I- TF-CBT</td>
<td>Sexual Abuse</td>
<td>SS</td>
<td>0.53 at post-test; 0.33 at 6 mnths; 0.28 at 12 mnths</td>
<td>10</td>
</tr>
<tr>
<td>Deblinger et al. (2006)</td>
<td>Clinical</td>
<td>C- Routine Therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohen et al. (2011)</td>
<td>Clinical</td>
<td>I- TF-CBT</td>
<td>Intimate Partner Violence</td>
<td>SS</td>
<td>0.25</td>
<td>8</td>
</tr>
<tr>
<td>de Roos et al. (2011)</td>
<td>Clinical</td>
<td>I-CBT</td>
<td>Fireworks Factory Explosion</td>
<td>NS</td>
<td>NA</td>
<td>12</td>
</tr>
<tr>
<td>Deblinger et al. (2001)</td>
<td>Clinical</td>
<td>I- CBT</td>
<td>Sexual Abuse</td>
<td>NS</td>
<td>NA</td>
<td>9</td>
</tr>
<tr>
<td>Deblinger et al. (2011)</td>
<td>Clinical</td>
<td>I- TF-CBT with TB; 8 &amp; 16 wks I- TF-CBT without TN; 8 &amp; 16 wks</td>
<td>Sexual Abuse</td>
<td>NS TN</td>
<td>0.44</td>
<td>7</td>
</tr>
</tbody>
</table>

Note. CBT= Cognitive Behavioural Therapy; EMDR= Eye Movement Desensitization and Reprocessing; ES= Effect Size; mnths= Months; NA= Not Applicable; NS= Not Significant; QRA= Quality Rating Assessment; SS= Statistically Significant; TF-CBT= Trauma-Focused Cognitive Behavioural Therapy; TN= Trauma Narrative
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Research Design</th>
<th>Intervention</th>
<th>Trauma</th>
<th>Reported Result</th>
<th>ES(d)</th>
<th>QRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farkas et al. (2010)</td>
<td>Clinical</td>
<td>I- EMDR</td>
<td>Child Maltreatment</td>
<td>SS</td>
<td>0.42 at post-test; 0.37 at 3 mths</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C- Routine Care</td>
<td></td>
<td></td>
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<td>Gelkopf &amp; Berger (2009)</td>
<td>Control</td>
<td>School-Based Resiliency Focused</td>
<td>Terrorism</td>
<td>SS</td>
<td>0.46 at 3 mths; 0.39 at 6 mths</td>
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<td>Gilboa-Schechtman et al. (2010)</td>
<td>Clinical</td>
<td>I- Prolonged Exposure Therapy (CBT) C- Time-Limited Dynamic-Therapy</td>
<td>Unspecified Trauma</td>
<td>SS</td>
<td>0.45 at post-test; 0.51 at 6 mths; 0.21 at 17 mths</td>
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<td>Jaberghaderi et al. (2004)</td>
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<td>I- CBT C- EMDR</td>
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<td>NA</td>
<td>10</td>
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<tr>
<td>Jaycox et al. (2009)</td>
<td>Control</td>
<td>School-Based CBT</td>
<td>Unspecified</td>
<td>SS</td>
<td>0.69</td>
<td>9</td>
</tr>
</tbody>
</table>

*Note.* CBT= Cognitive Behavioural Therapy; ES= Effect Size; EMDR= Eye Movement Desensitization and Reprocessing; mths= Months; NA= Not Applicable; NS= Not Significant; QRA= Quality Rating Assessment; SS= Statistically Significant
<table>
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<tr>
<th>Author(s)</th>
<th>Research Design</th>
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<th>Trauma</th>
<th>Reported Result</th>
<th>ES($d$)</th>
<th>QRA</th>
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<tr>
<td>Jaycox et al. (2010)</td>
<td>Clinical</td>
<td>I- School-Based TF-CBT C- CBITS</td>
<td>Natural Disaster (Hurricane)</td>
<td>NS</td>
<td>NA</td>
<td>9</td>
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<td>Jordans et al. (2010)</td>
<td>Control</td>
<td>School-Based Routine Therapy</td>
<td>Conflict-Affected</td>
<td>NS</td>
<td>NA</td>
<td>8</td>
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<tr>
<td>Kataoka et al. (2003)</td>
<td>Control</td>
<td>School-Based CBT</td>
<td>Community Violence</td>
<td>SS</td>
<td>0.29</td>
<td>11</td>
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<tr>
<td>Kemp et al. (2009)</td>
<td>Control</td>
<td>EMDR</td>
<td>Road Traffic Accident</td>
<td>SS</td>
<td>1.20</td>
<td>7</td>
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<tr>
<td>King et al. (2000)</td>
<td>Clinical</td>
<td>I- Child Alone CBT I- Family CBT C-Wait-list</td>
<td>Sexual Abuse</td>
<td>NS Between Child-Alone CBT and Family CBT SS between CBT and wait-list</td>
<td>Child-Alone CBT: 1.11 at post-test; 0.67 at 12 wks Family CBT: 1.26 at post-test; 0.90 at 12 wks</td>
<td>8</td>
</tr>
</tbody>
</table>

*Note.* CBT= Cognitive Behavioural Therapy; EMDR= Eye Movement Desensitization and Reprocessing; ES= Effect Size; NA= Not Applicable; NS= Not Significant; QRA= Quality Rating Assessment; TF-CBT= Trauma-Focused Cognitive Behavioural Therapy; wks= Weeks
<table>
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<tr>
<th>Author(s)</th>
<th>Research Design</th>
<th>Intervention</th>
<th>Trauma</th>
<th>Reported Result</th>
<th>ES((d))</th>
<th>QRA</th>
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<tbody>
<tr>
<td>Layne et al. (2008)</td>
<td>Clinical</td>
<td>I-School-Based psychoeducational therapy with grief-focused component C- Classroom based psychoeducation</td>
<td>War Exposure</td>
<td>NS</td>
<td>NA</td>
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<td>Raider et al. (2008)</td>
<td>Control</td>
<td>Sensory Therapy</td>
<td>Unspecified Trauma</td>
<td>SS</td>
<td>NEI</td>
<td>9</td>
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<tr>
<td>Ruf et al. (2010)</td>
<td>Control</td>
<td>Narrative Exposure Therapy</td>
<td>Organized Violence</td>
<td>SS</td>
<td>1.03</td>
<td>10</td>
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<tr>
<td>Scheeringa et al. (2011)</td>
<td>Control</td>
<td>TF-CBT</td>
<td>Unspecified Trauma</td>
<td>SS</td>
<td>1.10</td>
<td>5</td>
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<tr>
<td>Smith et al. (2007)</td>
<td>Control</td>
<td>CBT</td>
<td>Single-Incident Traumatic Event</td>
<td>SS</td>
<td>2.48</td>
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<tr>
<td>Stallard et al. (2006)</td>
<td>Clinical</td>
<td>I-Psychological Debriefing C-Neutral Non-Accident Questions</td>
<td>Road Traffic Accident</td>
<td>NS</td>
<td>NA</td>
<td>12</td>
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</tbody>
</table>

*Note.* ES= Effect Size; CBT= Cognitive Behavioural Therapy; NA= Not Applicable; NEI= Not Enough Information; NS= Not Significant; QRA= Quality Rating Assessment; TF-CBT= Trauma-Focused Cognitive Behavioural Therapy; SS= Statistically Significant
<table>
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<th>Author(s)</th>
<th>Research Design</th>
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<th>Trauma</th>
<th>Reported Result</th>
<th>ES($d$)</th>
<th>QRA</th>
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<tr>
<td>Stein et al.</td>
<td>Control</td>
<td>School-Based CBT</td>
<td>Community Violence</td>
<td>SS</td>
<td>1.08</td>
<td>7</td>
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<tr>
<td>(2003)</td>
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<td>Tol et al.</td>
<td>Control</td>
<td>School-Based Group</td>
<td>Political Violence</td>
<td>SS</td>
<td>0.45 at 1 wk; 0.44 at 6 wks</td>
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<tr>
<td>(2008)</td>
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<td>Intervention</td>
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</table>

*Note. ES= Effect Size; CBT= Cognitive Behavioural Therapy; QRA= Quality Rating Assessment; SS= Statistically Significant; wk(s)= week(s)*
Table 2

*Table 2. Average Quality Rating Assessment Score by Research Design*

<table>
<thead>
<tr>
<th>Research Design by QRA</th>
<th>Average QRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randomized Control Trial ((n=13), ) Moderate to High QRA ((\geq8))</td>
<td>10.08</td>
</tr>
<tr>
<td>Randomized Clinical Trial ((n=13), ) Moderate to High QRA ((\geq8))</td>
<td>9.29</td>
</tr>
<tr>
<td>Randomized Control Trial &amp; Randomized Clinical Trial ((n=7), ) Low QRA ((&lt;8))</td>
<td>6.43</td>
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</tbody>
</table>

*Note.* QRA= Quality Rating Assessment
Table 3

*The Average Effect Size of Each Intervention Type and Study Quality*

<table>
<thead>
<tr>
<th>Research Design by QRA</th>
<th>Therapy Type</th>
<th>Mean ES (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Randomized Control Trial (n=12), Moderate to High QRA (≥8)</strong></td>
<td>CBT (n=4)</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>CPT (n=0)</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>EMDR (n=2)</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>Family Specific (n=0)</td>
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<td>Exposure Therapy (n=1)</td>
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<tr>
<td></td>
<td>MED-RELAX (n=0)</td>
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</tr>
<tr>
<td></td>
<td>Psychological Debriefing (n=0)</td>
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</tr>
<tr>
<td></td>
<td>Psyedu (n=0)</td>
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</tr>
<tr>
<td></td>
<td>Resiliency Focused Therapy (n=2)</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>Sensory Therapy (n=1)</td>
<td>NEI</td>
</tr>
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<td></td>
<td>TLDP-A (n=0)</td>
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<td></td>
<td>General Counselling (n=2)</td>
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<tr>
<td><strong>Randomized Clinical Trial (n=16), Moderate to High QRA (≥8)</strong></td>
<td>CBT (n=9)</td>
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<tr>
<td></td>
<td>CPT (n=0)</td>
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<tr>
<td></td>
<td>EMDR (n=3)</td>
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<td>Exposure Therapy (n=1)</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Family Specific (n=0)</td>
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<tr>
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<td>MED-RELAX (n=1)</td>
<td>NS</td>
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<td></td>
<td>Psychological Debriefing (n=1)</td>
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<tr>
<td></td>
<td>Psyedu (n=1)</td>
<td>NS</td>
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<tr>
<td></td>
<td>Resiliency Focused Therapy (n=0)</td>
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<tr>
<td></td>
<td>Sensory Therapy (n=0)</td>
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<tr>
<td></td>
<td>TLDP-A (n= 1)</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>General Counselling (n= 5)</td>
<td>NS</td>
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</tbody>
</table>

*Note.* CBT= Cognitive Behavioural Therapy, CPT= Cognitive Processing Therapy, EMDR= Eye Movement Desensitization and Reprocessing Therapy, ES= Effect Size, MED-RELAX= Meditation- Relaxation Therapy, N/A= Not Applicable, NEI= Not Enough Information, NS= Not Significant, Psyedu= Psychoeducational, QRA= Quality Rating Assessment, TLDP-A= Time-Limited Dynamic Therapy
<table>
<thead>
<tr>
<th>Research Design by QRA</th>
<th>Therapy Type</th>
<th>Mean ES (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randomized Control Trial &amp; Randomized Clinical Trial (n=7), Low QRA (&lt;8)</td>
<td>CBT (n=3)</td>
<td>0.87</td>
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<td>CPT (n=1)</td>
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<td>EMDR (n=1)</td>
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<td></td>
<td>Family Therapy (n=1)</td>
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<td>MED-RELAX (n=0)</td>
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<td>Psychological Debriefing (n=0)</td>
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<td>Resiliency Focused Therapy (n=0)</td>
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<td>Sensory Therapy (n=0)</td>
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<td>TLDP-A (n=0)</td>
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</tr>
<tr>
<td></td>
<td>General Counselling (n=0)</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Note. CBT= Cognitive Behavioural Therapy, CPT= Cognitive Processing Therapy, EMDR= Eye Movement Desensitization and Reprocessing Therapy, ES= Effect Size, MED-RELAX= Meditation- Relaxation Therapy, N/A= Not Applicable, NEI= Not Enough Information, NS= Not Significant, Psyedu= Psychoeducational, QRA= Quality Rating Assessment, TLDP-A= Time-Limited Dynamic Therapy*
Table 4

*The Relationship Between Methodological Quality and Effect Size (d)*

<table>
<thead>
<tr>
<th>QRA</th>
<th>Mean Effect Size (d)</th>
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<tbody>
<tr>
<td>High Quality (n= 17, QRA of ≥ 10)</td>
<td>0.62</td>
</tr>
<tr>
<td>Moderate Quality  (n= 9, QRA of 8 ≤ 9)</td>
<td>0.59</td>
</tr>
<tr>
<td>High Quality (n= 17, QRA of ≥ 10)</td>
<td>0.62</td>
</tr>
</tbody>
</table>

*Note. QRA= Quality Rating Assessment*