Efficacy of Interventions for Sexually Abused Children – A Literature Review and Meta-Analysis of Treatment of Post Traumatic Stress Symptoms

Kirsi Peltonen*

University of Tampere, Finland

Abstract: *Background*: Child sexual abuse is a significant risk factor for psychopathology. Earlier reviews indicate that psychosocial interventions may be effective for some symptoms, but a comprehensive picture is still lacking. Moreover, the rapid increase of research requires evaluations to be updated. The present systematic review aims at describing the research on intervention efficacy among sexually abused children, and analyses their effect in decreasing the post traumatic stress symptoms (PTSS).

Methods: The qualitative literature review offers the overview of recent interventions among sexually abused children. It describes the quality of evidence as well as the modality (group vs. individual, family vs. child only) and targeting (universal, selective, indicated) of the interventions. To evaluate the efficacy of interventions, the meta-analysis is applied.

Results: The results revealed 23 relevant studies with total of 31 intervention conditions published between 2000 and 2013. The meta-analysis showed that when intervention groups were compared to control groups with no treatment at all, interventions showed a large power of positive changes in PTSS. However, when cognitive behavioral therapy (CBT) groups were compared to control groups which received some other intervention, there was no difference in PTSS changes among experimental and control groups.

Conclusions: Results suggest that psychosocial interventions with sexually abused children are beneficial but it is still not clear, which are the most effective methods. The results also highlight the consequences of methodological decisions when conducting meta-analysis. However, because of some limitations of the study, the results of this review should be regarded as tentative and suggestive and further elaboration of the constantly growing evidence is needed.

Keywords: Child sexual abuse, Interventions, Post traumatic stress.

INTRODUCTION

Sexual Abuse and Child Mental Health

Child sexual abuse (CSA) is a common and harmful phenomenon. The comprehensive meta-analysis [1] combined prevalence figures of sexual abuse reported in 217 publications with a total of nearly one million participants. The overall estimated child sexual abuse prevalence was 13% in self-report studies. Another meta-analysis [2] which included information from 65 studies of 22 countries 7.9% of men and 19.7% of women have experienced sexual abuse before the age of 18. Most definitions of abuse focus on contact-type experiences (e.g. forced touching, penetration) and exclude noncontact type of encounters (e.g. exposure to exhibitionists, attempt experiences).

There is strong evidence [3, 4] that childhood sexual abuse forms a substantial risk for psychiatric disorders and behavioral disorders both in childhood and in adulthood. However, the rough estimation suggests that about 40% percent of children are diagnostically asymptomatic [5] and some children develop symptoms months, or even years after experiences of sexual abuse [6].

The most common mental health problems of child sexual abuse are intense fears [7, 8] post traumatic stress disorder (PTSD) [9, 10], aggression [11, 12] and sexualized behavior [13, 14]. Among these, PTSD seems to be the most common symptom. It develops in 37 – 53% of abused children. Additionally, many children without diagnosed PTSD, have some of the PTSD symptoms such as re-experiencing or avoidance [5, 15, 16]. That is why the main focus of the present review is on post-traumatic stress.

Existing Evidence of Interventions Targeted to Sexually Abused Children

Several qualitative reviews and meta-analysis examining treatment efficacy for child sexual abuse have been published. Some of them focus only on CBT-based interventions, and some have a wider scope including treatments from different backgrounds. Next, the core findings of them are outlined.

There is consensus among earlier reviews that treatment conditions, in general, result in greater

*Address correspondence to this author at the Institute for Advanced Social Research, IASR, 33014 University of Tampere, Finland; Tel: 358(0)50 3186181; E-mail: kirsi.peltonen@uta.fi

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improvements in several behavioral dimensions relative to control groups [17-22]. However the effect sizes, that imply a greater symptom reduction in the treatment groups compared to control conditions, vary between small and large depending on what kind of control groups are used (such as waiting list or treatment as usual).

There is a disagreement over which treatment type shows the greatest efficacy. Some researchers say that trauma focused cognitive behavioural therapy (CBT) and its trauma focused form (TF-CBT), with the core element of gradual exposure, are the most effective in treating sexually abused children [17, 19]. Other researchers suggest that nonbehavioral treatment types have the largest effect on symptom reduction [21]. Also, symptom specific differences in efficacy have been suggested [22, 20]. There are four reviews focusing only on CBT- based interventions. They conclude that sexually abused children can significantly benefit from CBT-based treatments. Interventions significantly reduced at least some of the children's mental health problems including PTSD [23-26].

To conclude, there is strong heterogeneity among earlier reviews concerning a) the included outcome variables, b) the quality of reviews and c) the methods used in aggregating the results. Subsequently, some of the reviews imply the greater benefit of CBT-based methods while others do not. Coren's *et al*. [27] meta-review combined these controversial findings [17, 20-22, 25]. Results suggested that a clear benefit of one intervention type over another cannot be found. In other words, there was no superior treatment type among sexually abused children.

This review aims at sharpening the picture of the most effective treatments of sexually abused children and tries to fill some of the gaps identified in earlier reviews. First, the current meta-analysis focuses on post traumatic stress and uses both single- and between group designs with separate comparisons for differential control groups. Second, in the present review, the quality of settings and processes in research is evaluated by using a 7-grade classification by Biglan *et al*. [28]. The grading for quality of evidence ranges from single case reports to multiple well-designed, randomized, controlled trials. The studies are also screened in terms of whether they report treatment efficacy or effectiveness. In intervention literature there is sometimes confusion about these two concepts. Based on widely used RE-AIM framework [29-31] the efficacy studies are characterized by: 1) quite homogeneous sample excluding severe comorbid problems, 2) intensive, specialized protocol and 3) one study setting or settings with many resources and expert staff, 4) implementation by research staff closely following specific protocol and 5) focus on individual level. The effectiveness studies, in contrasts, are characterized by heterogeneous, representative sample. They are implemented by variety of different staff using adapted protocol and costs and maintenance are of close consideration.

Furthermore, the present review updates the data of intervention studies on CSA by adding the studies which are published after the year 2000. Earlier research mainly concentrate on studies published in 1980-2000. The present review includes 15 studies, which are not included in any of the earlier reviews. They are analyzed together with those 21st century studies that are also part of the earlier reviews. Taken together, the main rationale of this study is to examine whether the new evidence of the field supports the findings which are mainly based on studies from 1980-2000. It also seeks to explain some controversial findings from earlier reviews.

Aims of the Study

The study describes the research on intervention efficacy among sexually abused children, and analyses their effect in decreasing the post traumatic stress symptoms (PTSS).

1) The qualitative literature review offers the overview of recent interventions among sexually abused children. It describes the quality of evidence as well as the modality (group vs. individual, family vs. child only) and targeting (universal, selective, indicated) of the interventions.

2) In the statistical meta-analysis it is examined 1) whether the interventions are effective in reducing the post traumatic stress symptoms and 2) how the type of intervention (CBT vs. other interventions) is associated with the treatment efficacy.

METHODS

Eligible studies for the review examined the interventions efficacy among children exposed to sexual abuse published between 2000 and 2013. The review proceeded in three stages (see Figure **1**). First, several combinations of keywords, e.g. child sexual

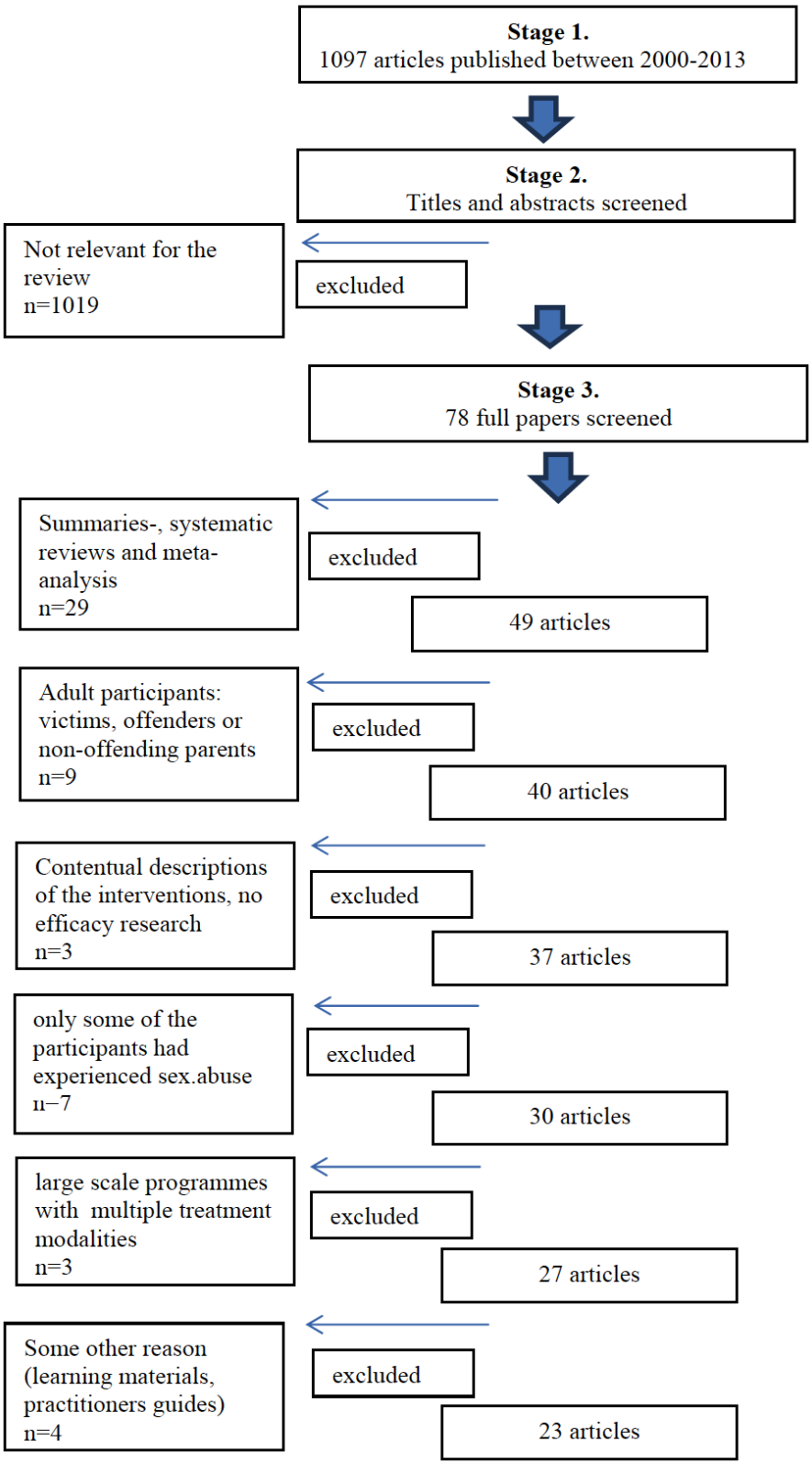


Figure 1: A flow chart presenting the selection of the articles included in this review. The excluded articles with reason for exclusion are on the left hand side column.

abuse, prevention/intervention/treatment, traumatic stress, PTSD, mental health, symptoms and child development, were used to identify relevant studies. In order to limit the search on interventions studies the keyword “prevention”, “intervention” or “treatment” and “child sexual abuse” were always part of the

combination. The search was also done by tracking the names of authors revealed by earlier reviews. The databases of Ebsco Host, Ovid (including PsycArticles) and Cochrane Database of Systematic Reviews were used. Also, the reference lists of earlier reviews were screened to identify the eligible studies. Second, the titles and abstracts were reviewed for relevance. In cases where the full text was not available but the abstract showed to be relevant, the full text article was obtained. Third, the full papers were screened against the inclusion criteria to be reviewed: (a) the intervention or treatment includes systematic action for children exposed to sexual abuse with or without trauma symptoms for a defined time period (b) mean age of subjects is less than 18, (c) intervention description and results of efficacy are published in international scientific journals in English. To be included in the meta-analysis two additional criteria were necessary: (d) primary foci are child and adolescent mental health, and psychological, social or behavioral development and functioning, (e) the sufficient data is provided in order to calculate an effect size for PTSS. In order to conduct an elaborated and focused systematic review the studies in which only part of participants had experienced sexual abuse and others have different kind of trauma history, were omitted.

Assessing the Quality of Evidence

The quality in settings and processes of the interventions were evaluated by using the 7-grade classification by Biglan *et al*. [28]. Some investigators suggest that because of the greater difficulties in assessing their methodological quality non-randomized studies should be excluded from reviews. However, in the field of child sexual abuse (as in many other areas of health care) few randomized controlled intervention trials exist. Based on Downs & Black [32] suggestions the heterogenic research was included. In order to obtain a comprehensive and objective view of the existing evidence the Biglan *et al*. [28] classification was used. The first four levels assess the quality of randomized controlled studies whereas the levels 5-7 assess the evidence from non-randomized or even observational studies. The grading for quality of evidence includes the following levels: Grade 1: Evidence from multiple well-designed, randomized, controlled trials conducted by two or more independent research teams and evidence of effectiveness when the intervention is implemented in its intended setting with adequate training and monitoring. Grade 2: Evidence from multiple well-designed, randomized, controlled trials conducted by two or more independent research teams. Grade 3: Evidence from multiple well-designed, randomized, controlled trials conducted by a single research team. Grade 4: Evidence from at least one well-designed, randomized, controlled trial. Grade 5: Evidence from comparisons between groups that are not effectively randomized to conditions. Grade 6: Evidence from pre–post evaluation with no comparison group. Grade 7: Endorsement based on clinical experience by respected authorities, descriptions of programs and case reports. Also, the author's explicit statements of whether they study the efficacy or the effectiveness of the intervention is reported.

Assessing the Targeting of Interventions

To assess the targeting of the interventions the classification system of Gordon [37] was applied. The system depicts the following three levels: 1) Universal interventions are targeted to all members or specific risk groups inside normal populations, members who show no disorders but can be eligible or prone to their onset. These interventions could be offered *via* public health care services or specific programs, such as information packages about harmful effects of sexual abuse, 2) Selective interventions focus on subgroups of populations whose risk of becoming ill is above average, for example children whose contact sexual abuse is confirmed, 3) Indicated interventions aim at alleviating the suffering and decrease the amount of disability among people who have already the diagnosis of a medical disorder, in this case children with current symptoms of post-traumatic stress disorder, depression etc.

Evaluating Efficacy

To evaluate the efficacy of preventive interventions, the meta-analysis was applied and combined effect sizes (ES) for PTSS were calculated. First, for single group studies, the ES was obtained from mean, standard deviation and correlation estimates or straight from the effect size statistics (partial eta squared or Cohen's d). In order to make comparisons between effect sizes the dependence among means should be corrected by entering the correlation between the two means [36]. Partial eta squared estimates were converted to Cohen's f and further to Cohen's d with the following formulas: f = sqr(eta^2 / (1 - eta^2) and d = 2*f [36].

Second, for experimental and quasi-experimental studies which included intervention and control groups, ES was defined as the difference between the mean

scores of the intervention and control group at post-intervention, divided by the pooled harmonic standard deviation of the outcome scores of the two groups. The standardized mean difference procedure by Lipsey & Wilson [34] was used. Data was analyzed for summary effects using Review Manager 4.2 software. It should be noted that the information of effect size does not determine the significance level of the intervention efficacy, or vice-versa. Sample-based effect sizes estimate the strength of an apparent relationship whereas the significance level reflects whether the relationship could be due to chance. By convention, if $p < .05$ (i.e. below 5%), the difference is taken to be large enough to be 'significant'; if not, then it is 'not significant'. To avoid drawing flawed conclusions with small sample size, Coe [35] advises reporting both significance level and effect size, together with a confidence interval. The average effect size for change in PTSS was evaluated using Cohen's [36] widely used criteria of .20 being the smallest effect size that has any significant practical or clinical meaning, with three specific categories or levels of power: small (.20 to .49), medium (.50 to .79) and large (.80 and higher).

RESULTS

Description of the Studies and Included Interventions

The final search revealed 23 eligible empirical studies published between 2000 and 2013 (see Figure **1** and Tables **1a** and **1b**). Searching found all 21st century studies that were included in earlier reviews (see introduction). They were added with 15 more studies which were not reported in earlier reviews. The 23 studies analyzed the efficacy of 31 (hereafter k=31) intervention conditions as four studies compared two different intervention types. Twelve of the interventions were CBT-based, and except two, all were manualized. Nineteen studies analyzed interventions with various methods such as counseling and psychoeducation, psychoanalytic therapy, art therapy and play therapy. Most of them were not manualized (13/19).

The age of the participants varied between 2-17 years. Only nine studies offered information about the timing of abuse in relation to the beginning of the intervention. Two studies reported the children's *mean age at the onset of abuse* and at the beginning of the intervention. In the first study [38] the mean age at the onset of abuse was 4.5 and at the beginning of the intervention 6.2. In the second study [39] children were approximately 5.5 when the abuse has started and about 11.5 when they received intervention. Four studies reported the *mean time since the last abuse* before the intervention. Children had been exposed to sexual abuse at various lengths e.g. half a year [40], one year [41], two years [42] and four and a half years [43] before the beginning of the intervention. Three studies reported *how long the abuse had lasted* before intervention. The time frame varied from 6 months [44] to 2 years [45] and four years [46].

Quality of Evidence

Seven out of 23 studies were randomized control trials (RCT). More detailed, CBT and its trauma focused form (TF-CBT) were the only intervention types that offered the evidence at Grade 2 at the Biglan's *et al*.7-grade classification [28]. This means multiple well-designed, randomized, controlled trials conducted by two or more independent research teams [39-43, 47]. Individual psychoanalytic therapy [45] reached the Grade 4 at Biglan's classification, with evidence from RCT. The performance-based intervention Klein Kinderspiel is also allocated at level 4 with a group randomized design [48]. Six studies had quasi-experimental designs reaching the Grade 5. These were: Structured Group Art Therapy [49], Psychoeducational Group Therapy [50], Child Sexual Abuse Treatment Program [51], The Tweenees program [52], My Body, My Boundaries Curricula [53] and group- and individual therapies combining different methods [54]. Six studies included no control groups so they reached the Grade 6. Evidence from pre-post evaluation with no control group was available from Children's Treatment Program [55], Game-Based CBT [56], Gender-specific CBT [57], Play Therapy [38, 58] and Art Therapy [59]. The studies of Therapeutic counseling and Group CBT met the Grade 7 with endorsement based on description of intervention and a case report [46, 60].

In most (21/23) of the studies, authors stated that they report the efficacy of the intervention. Based on RE-AIM framework no clear distinction was observed between them and the remaining two studies which stated that they report the effectiveness of the intervention.

Modality and Targeting

Eleven (out of the k=31) interventions were based on individual methods, whereas ten interventions applied group based methods and two combined both individual and group processes. Two interventions

Table 1a: Description of Included Quantitative Studies

Authors and Interventions	**Number of participants** **Age of Participants**	**Recruitment of participants** **Type of sexual abuse** **Timing of intervention**	**Mental health criteria** **Targeting**	**Quality of Evidence** **Measurement time**	**Intervention modality***	**Type of Intervention** **-CBT-based/Other**	**Efficacy of intervention (p<.05)** **full names of the PTS-instruments below the Table****
Cohen, Deblinger, Mannarino & Steer (2004) + Deblinger, Mannarino, Cohen & Steer (2006)	N=203 8-14 (10.76)	Children referred from multiple institutions Contact sexual abuse confirmed Mean months since last abuse: 12.25 (SD 19.4)	At least one symptom in each of PTSD clusters Indicated	RCT Pre- Post & 6 months (Cohen et al. 2004) and 12 months follow up (Deblinger et al. 2006)			Decrease in -Post traumatic stress (K-SADS) -Depression -Shame Increase in -Crediability -Interpersonal trust Both groups benefitted but favoring TF-CBT group in post-test and follow-up in all abovementioned measures
TF-CBT (Trauma Focused Cognitive Behavioral Therapy)					Family Individual	CBT, manualized 12 weekly individual 1.5 hour sessions to parent and child plus joint parent–child 30 minute sessions	
CCT (Child Centered Therapy)					Family Individual	Other, manualized 12 weekly 1.5 h individual sessions to parent and child	
Cohen, Mannarino & Knudsen (2005)	N= 82 8-15 (11.4 and 10.8)	Children referred form outpatient child psychiatric program Contact sexual abuse confirmed Abuse within 6 months prior intervention	Significant symptomatology Indicated	RCT Pre-, Post & 6-month and 12-month follow up			Decrease in - Post traumatic stress (TSCC) -Depression -Anxiety -Sexual problems Both groups benefitted but favoring TF-CBT group in all abovementioned measures
TF-CBT (Trauma-Focuced Cognitive-Behavioral Therapy)					Family Individual	CBT, manualized 12 45min. sessions individually to the child and parent	
NST (Non-directive Supportive Therapy)					Family Individual	Other, manualized 12 45min. sessions individually to the child and parent	
Cohen, Mananrino, Perel & Staron (2007)	N= 24 10-17	Children referred from multiple sources Contact sexual abuse confirmed Mean no. of months since most recent abuse 22.9	At least one symptom in each of PTSD clusters and clinically significant impairment Indicated	RCT Pre- & post			Decrease in - Post traumatic stress (K-SADS) -Global impairment Both groups benefitted. No differences between sertraline and placebo groups in Traumatic stress measure Larger improvement in Global impairment in sertraline groups

(Table 1a). Continued.

Authors and Interventions	**Number of participants** **Age of Participants**	**Recruitment of participants** **Type of sexual abuse** **Timing of intervention**	**Mental health criteria** **Targeting**	**Quality of Evidence** **Measurement time**	**Intervention modality***	**Type of Intervention** **-CBT-based/Other**	**Efficacy of intervention (p<.05)** **full names of the PTS-instruments below the Table****
TF-CBT Trauma-Focused Cognitive Behavioral Therapy + sertraline					Family Individual	CBT, manualized 12 weekly sessions for children and parents + medication	
Trauma- Focused Cognitive Behavioral Therapy + placebo					Family Individual	CBT, manualized 12 weekly sessions for children and parents	
Deblinger, Stauffer & Steer (2001)	N=44 2-8 (5.5)	Children referred from Regional Child Abuse Diagnostic and Treatment Center Contact sexual abuse confirmed First sexual abuse estimated at 4.5 years of age	Selective	RCT Pre- post & 3 month follow-up			Decrease in - Post traumatic stress (IES) -Intrusion & Avoidance -CBCL total -Sexual behavior Both groups benefitted in all abovementioned measures
CBT (Cognitive Behavioral Therapy)					Family (separate groups for parents and children Group	CBT, manualized 11 1hour 45 min. sessions	
Support					Family (parents only) Group	Other, manualized 11 1hour 45 min. sessions	
Deblinger, Mannarino, Cohen, Runyon & Steer (2011)	N= 210 4-11 (7.7)	Children referred from multiple institutions Contact sexual abuse confirmed No information about timing	At least one symptom in each of PTSD clusters Indicated	RCT Pre-, Post			Decrease in - Post traumatic stress (K-SADS) (favoring 16 session groups) -Anxiety -Fears of thinking and talking about the event (favoring TN-group) All groups benefitted. Largest reductions in traumatic stress in 16 sessions groups. Largest reductions in fears in Trauma Narrative groups
TF-CBT-TN (Trauma- Focused Cognitive Behavioral Therapy with Trauma Narrative)					Family Individual	CBT, manualized 2 groups: 8 and 16 sessions with Trauma Narrative First: 45 min individual meetings for parent and child Later: conjoint parent–child time	

(Table 1a). Continued.

Authors and Interventions	**Number of participants** **Age of Participants**	**Recruitment of participants** **Type of sexual abuse** **Timing of intervention**	**Mental health criteria** **Targeting**	**Quality of Evidence** **Measurement time**	**Intervention modality***	**Type of Intervention -CBT-based/Other**	**Efficacy of intervention (p<.05)** **full names of the PTS-instruments below the Table****
TF-CBT (Trauma- Focused Cognitive-Behavioral Therapy)					Family Individual	CBT, manualized same as above but without Trauma Narrative	
Trowell, Kolvin, Weermathri & Sadowski (2012)	N=71 6-14 (10)	Children referred from two clinics Contact sexual abuse confirmed Abuse disclosed within 2 years, 27 out of 71 duration more than 2 years	Acute and chronic symptoms of emotional or behavioral disturbances Indicated	RCT Pre- post (year after start)- & second year follow up			Decrease in - Post traumatic stress (K-SADS) favoring individual therapy
Individual psychoanalytic Therapy					Family Individual	Other, manualized Psychoanalytic Therapy +support for carers Up to 30 weekly 50 min. sessions	
Psychoeducational Group Therapy					Family Group	Other, manualized Group therapy with psychotherapeutic and psychoeducational components Up to 18 sessions + work with carers	
Krahe & Knappert (2009)	N= 148 first and second graders, (7.55 years)	Children recruited from primary school in Germany	Universal	Group RCT			Increase in -Self protective skills Both groups benefitted but favoring live performance group
K]ein Kinderspiel					Child Group	Other 60 min. live performance + a three-hour information evening for parents	
Controls						60 min DVD of the performance	
King, Tonge, Mullen, Myerson, Heyne, Rollings, Martin & Ollendick (2000)	N= 36 5.2-17.4 (11.4)	Children referred from sexual assault Centers Sexual abuse confirmed Time from abuse: 3months-8year 10 months, mean 4.5 years	Majority: PTSD or severe stress symptoms Indicated	RCT Pre- Post- & 12 week Follow up			Decrease in - Post traumatic stress (ADIS) -Re-experiencing -Avoidance -Hyperarousal -Fear -Anxiety Both groups benefitted, no differences between groups across all measurement points

(Table 1a). Continued.

Authors and Interventions	**Number of participants** **Age of Participants**	**Recruitment of participants** **Type of sexual abuse** **Timing of intervention**	**Mental health criteria** **Targeting**	**Quality of Evidence** **Measurement time**	**Intervention modality***	**Type of Intervention** **-CBT-based/Other**	**Efficacy of intervention (p<.05)** **full names of the PTS-instruments below the Table****
Child CBT					Child Individual	CBT, manualized 20 weekly 50 minute sessions	
Family CBT					Family Individual	CBT, manualized 20 weekly 50 minute sessions for children AND 20 weekly 50 minute training sessions for non-offending mother	
Controls		Waiting List					
Jaberghaderi, Greenwald, Rubin, Zand & Dolatabadi (2004)	N=14 12-13	Recruitment by letter, children volunteered No information about type of sexual abuse Sexual abuse 6 months or more prior to study	Clinically significant PTSD Indicated	RCT, Pre- & post			Decrease in -Post traumatic stress (CROPS) EMDR group improved significantly, CBT group not
Cognitive Behavioral Therapy (CBT)					Child Individual	CBT, manualized Up to 12 45 min. sessions + total of 1,5 hours of homework	
Eye Movement Desensitization an Reprocessing (EMDR)					Child Individual	Other, manualized Up to 8 30 min. sessions	
Nolan, Carr, Fitzpatrick, O'Flaherty, Keary, Turner, O'Shea, Smyth & Tobin (2002)	N= 38 4-17 (12.6)	Children referred from rural services for sexually abused children Sexual abuse confirmed No information about timing	Selective	Quasi-Exp., Pre- & post (after 6 months)			Decrease in -Post traumatic stress (TSCC) -Depression(and most of the CDI subscales) -CBCL total score (and most of the subscales) Both groups benefitted, no differences between groups
Individual Therapy					Child Individual	Other 18 hours	
Group + Individual Therapy					Child Individual	Other 20 hours	
Tourigny, Hebert, Daigneault & Simoneau (2005)	N=42 13-17 (14.6)	Children recruited from Abuse Center Severe abuse confirmed No information about timing	Selective	Quasi-Exp. Pre- post-			Decrease in - Post traumatic stress (TSCC) -Anxiety -Depression -Dissociation Increase in -Social behavior

(Table 1a). Continued.

Authors and Interventions	**Number of participants** **Age of Participants**	**Recruitment of participants** **Type of sexual abuse** **Timing of intervention**	**Mental health criteria** **Targeting**	**Quality of Evidence** **Measurement time**	**Intervention modality***	**Type of Intervention** **-CBT-based/Other**	**Efficacy of intervention (p<.05)** **full names of the PTS-instruments below the Table****
Psychoeducational group therapy					Child Individual	Other Psychoeducational Group Therapy 20 weekly 2hour sessions	
Controls							
Bagley & LaChance (2000)	N= 57 9-13 (11.2)	Children referred from child protection services Sexual abuse confirmed (admitted by father) No information about timing	Selective	Quasi-Exp. Pre- & post (after two years)			Decrease in -Depression Increase in -Self-esteem
CSATP Child Sexual Abuse Treatment Program					Family (including offending father) Group + Individual	Other Over two years 78 h Individual therapy, 37 h dyadic therapy, 32 h group therapy, 14 h family therapy	
Controls							
Pretorius & Pfeifer (2010)	N=25 8-11 (9.6)	Children referred from children's homes History of sexual abuse No information about timing	Selective	Quasi-Exp. Experimental and control groups 1: pre and post, Experimental and control groups 2: only post			Decrease in -Post traumatic stress (TSCC) -Depression -Anxiety
Structured Group Art Therapy					Child Group	Other 4 themes based on Gestalt Therapy, Client Centered approach and Abuse-focused approach	
Controls							
Baker, Gleason, Naai, Mitchell & Trecker (2013)	N=80 7-10	Children from three selected elementary school classes	Universal	Quasi-Exp. Pre- and Post			Increase in Knowledge of inappropriate touch and what to do if experiencing sexual abuse
My Body My Boundaries Curricula					Child Group	Other, manualized Curricula of respecting personal boundaries, 4 lessons	
Controls							
Barron & Topping (2013)	N=20 6-13 (10.2)	Children referred from survivor of abuse organisation History of sexual abuse No information about timing	Selective	Quasi-Exp. Pre- and Post			

(Table 1a). Continued.

Authors and Interventions	**Number of participants** **Age of Participants**	**Recruitment of participants** **Type of sexual abuse** **Timing of intervention**	**Mental health criteria** **Targeting**	**Quality of Evidence** **Measurement time**	**Intervention modality***	**Type of Intervention -CBT-based/Other**	**Efficacy of intervention (p<.05) full names of the PTS-instruments below the Table****
The Tweenees					Child Group	Other, manualized, 4, 50 minute lessons of different topics	Increase in -Safety knowledge/ skills and potential for further disclosure
Controls							
Duffany & Panos (2009)	N=47 3-11	Children referred from social services agencies Sexual abuse confirmed No information about timing	Selective	Single group, Pre- post- and 4- and 6-months follow-up			Decrease in -Post traumatic stress (YOQ) -Anxiety Increase in -Recognizing feelings -Setting boundaries -Expressing anger
CTP Children's Treatment Program					Family Group	Other 12 weekly lessons on different topics	
Misurell, Springer & Tyron (2011)	N= 48 5 -10(7.28)	Children recruited from outpatient clinic specializing child abuse Contact sexual abuse confirmed No information about timing	Selective	Single Group, Pre- & post-			Decrease in -Anxiety -Social behavior -CBCL total score -Sexual Behavior etc. No changes in Post traumatic stress
GB-CBT Game-Based Cognitive Behavioral Therapy					Child Group	CBT 12 1,5 hour structured play sessions	
Arnold, Kirk, Roberts, Griffith, Meadows & Julian (2003)	N= 41 12-17	Incarcerated girls, referred by the staff of the secure care facility Self-identified sexual abuse No information about timing	Indicated (incarceration)	Single Group Pre- & post			Decrease in -Depression -Aggression -Guilt etc. Increase in -Self esteem
Gender-specific CBT					Child Individual+Group	CBT Typically 26 weekly individual sessions + group treatment for those who felt to be appropriate	
Reyes & Asbrand (2005)	N= 18 7.3-16.6 (11.1)	Children referred from various sources in the community Sexual abuse evidenced Onset of abuse 1-12 year old (mean age 6.17, sd 2.9) occurrence from single case to 7 years and ongoing abuse	Selective	Single Group Pre- & post			Decrease in - Post traumatic stress (TSCC) -Anxiety -Depression

(Table 1a). Continued.

Authors and Interventions	Number of participants Age of Participants	Recruitment of participants Type of sexual abuse Timing of intervention	Mental health criteria Targeting	Quality of Evidence Measurement time	Intervention modality*	Type of Intervention -CBT-based/Other	Efficacy of intervention (p<.05) full names of the PTS-instruments below the Table**
Play Therapy					Child (some may have engaged in family therapy or parenting classes initiated by therapist) Individual	Other Individual 50 min weekly play therapy sessions over nine months (average: total of 31 sessions)	
Scott, Burlingame, Starling, Porter & Lilly (2003)	N= 26 3-9 (5.6)	Children referred from Child and Family Services and Children's Justice Center Sexual abuse confirmed No information about timing	Sexualized behavior Indicated	Single Group Pre- & post			Increase in -Feelings of competency
Play Therapy					Child Individual	Other 7- 13 sessions (average ten sessions) of play therapy	
Pifalo (2006)	N= 41 8-16	Children referred form Child Advocacy Center No information about type of sexual abuse or timing	Selective	Single Group Pre- & post			Decrease in: -Post traumatic stress (TSCC) -Anxiety -Depression -Anger -Dissociation -Sexual problems
Art Therapy and Cognitive Behavioral Therpay					Child Group	Other One hour weekly group sessions of art therapy for eight weeks	

*Family/Child Only.
Group= including several children or families.
Individual= including one child or parents or parent-child dyad.
**CROPS=Child Report of Post-traumatic Symptoms.
YOQ=Youth Outcome Questionnaire.
ADIS= Child version of the Anxiety Disorders Interview Schedule for DSM-IV.
IES= Identified Event Scale.
K-SADS= Kiddie-Schedule for Affective Disorders and Schizophrenia.
TSCC= The Trauma Symptom Checklist for Children, PTS-subscale.

Table 1b: Description of Included Qualitative Studies

Authors and Interventions	Number of participants Age of Participants	Recruitment of participants Type of sexual abuse Timing of intervention Mental health criteria Targeting	Quality of Evidence Measurement time	Intervention modality*	Type of Intervention -CBT-based/Other	Efficacy of intervention (p<.05) full names of the PTS-instruments below the Table**
Tjersland, Mossige, Gulbrandsen, Jensen & Reichtel (2006) Therapeutic counseling	N= 23 families 32 children 3-16	Families referred from different agencies Concern of sexual abuse (not proven) Selective -	Qualitative, follow-up interviews	Family Individual	Other 6 or more sessions with different therapeutic ideas	
Hubel, Maldonado, Tavkar, Hansen, Flood (2011) CBT (group)	Case-study 11	Child referred from Sexual Abuse Family Education Project Sexual abuse confirmed Symptoms of anxiety, post-traumatic stress and fears= Indicated Sexual abuse over four years (age 8-11)	Qualitative	Family Group	CBT, manualized 12 90 min. group-sessions	Traumatic stress (CITES-R-PTSD = Children's Impact of Traumatic Events–Revised–Posttraumatic Stress Disorder) after the term Traumatic stress Anxiety Fears

were universal, targeted to all children in community. In fourteen interventions (k=31) the caregiver was included in the interventions providing joint parent-child- or separate sessions. Only in one of these interventions the offending father was included. Rest of the interventions [19] was targeted to abused child only. Interventions in eleven studies were targeted to sexually abused children with or without current psychiatric problems. According to Gordons [37] classification they were selective interventions. Ten studies reported the efficacy of indicated interventions, as only children with severe psychiatric or behavioural problems were included.

Efficacy

Out of 23 studies, 21 quantitatively analyzed the efficacyof intervention, whereas two studies offered qualitative data for efficacy. The study designs clearly divided into three sections: 1) single group designs 2) psychosocial interventions based on different theoretical backgrounds vs. control groups without any treatment and 3) CBT-based interventions vs. control groups who received some other intervention.

As can be seen in Table **1**, majority (14/21) of the quantitative studies included the changes in PTSS symptoms as an outcome measure of intervention. All confirmed the efficacy. Other symptoms that were commonly measured, and which showed a decrease among children participating in the interventions were anxiety (9 studies) and depression (8 studies). Some of the studies measured global impairment, sexualized behavior, social behavior, fears and internalizing and externalizing behavior as well as changes in feelings such as anger, fear and shame. PTSS was the only outcome to be analyzed in meta-analyses across single group studies as well as randomized control trials and quasi-experimental designs.

Single Group Designs

Seven out of 23 studies were single group designs. Two of these studies [57, 58] didn't measure post traumatic stress as an outcome. Out of remaining five studies four [55, 56, 59, 38] provided sufficient information for effect size calculation i.e. Cohen's d, partial eta squared or means and standard deviations together with sample size and pre- & post test scores correlation. The mean effect size of four single group studies revealed a medium power of positive changes in PTSS among children attending intervention (Cohen's d= .66).

Psychosocial Interventions vs. Control Group with no Treatment

Two studies [43, 47] measured the efficacy of psychosocial intervention in decreasing the PTSS compared to control group without any treatment or support. The study of the King *et al*. [43] compared both child- and family CBT based intervention groups to control group. These interventions were added separately to analysis. At the Tourigny's *et al*. [50] study children participated in psychoeducational intervention. The total number of participants in meta-analyses was 51at the experimental group and 39 at the control group. ES estimates are interpreted by their positive or negative value. Negative ES values reflect the change in dependent variable, post traumatic stress (PTSS), which favors experimental group, whereas positive ES values reflect a change in the dependent variable, which favors control group. As can be seen in Table **2**, the weighted mean effect size implies a significant result favoring intervention group (Cohen's d= -1.26, Z=5.30, p<001). This means that interventions showed a large power of positive changes in traumatic stress among experimental group compared to control group. There was no statistical heterogeneity (x^2 = 0.47, p=ns.) between the studies.

Cognitive Behavioral Therapy vs. other Interventions

Four studies [39-42] measured the efficacy of intervention based on cognitive behavioural therapy (CBT) in decreasing the PTSS compared to control

Table 2: Standardized mean difference effect sizes and 95% confidence intervals for intervention and its effect on post-traumatic stress symptoms: Psychosocial interventions vs. Control group with no treatment

	Experimental			Control				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
King et al. 2000 Child	7.58	4.42	12	11.36	2.11	12	29.0%	-1.05 [-1.92, -0.19]
King et al. 2000 Family	6.5	5.14	12	11.36	2.11	12	27.9%	-1.19 [-2.08, -0.31]
Tourigny et al., 2005	10.9	4	27	16.6	3.7	15	43.1%	-1.43 [-2.14, -0.73]
Total (95% CI)			**51**			**39**	**100.0%**	**-1.26 [-1.72, -0.79]**

Heterogeneity: Tau² = 0.00; Chi² = 0.47, df = 2 (P = 0.79); I² = 0%
Test for overall effect: Z = 5.30 (P < 0.00001)

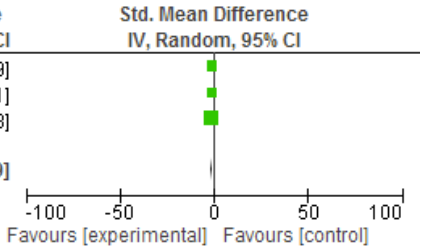
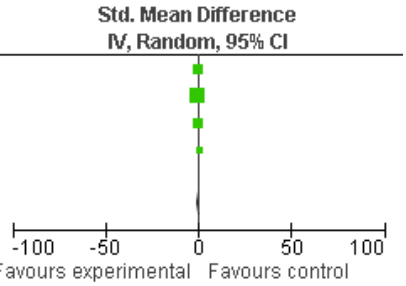


Table 3: Standardized mean difference effect sizes and 95% confidence intervals for intervention and its effect on post-traumatic stress symptoms: Cognitive behavioral therapy vs. other interventions

	Experimental			Control				Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI
Cohen et al. 2005	8.78	4.88	30	9.92	5.28	19	24.6%	-0.22 [-0.80, 0.35]
Cohen et al., 2004	1.53	1.39	89	2.32	1.81	91	41.0%	-0.49 [-0.78, -0.19]
Deblinger et al. 2001	14.67	20.28	21	12.35	11.65	23	23.9%	0.14 [-0.45, 0.73]
Jaberghaderi et al. 2004	22.71	6.9	7	18.86	7.9	7	10.6%	0.49 [-0.58, 1.55]
Total (95% CI)			**147**			**140**	**100.0%**	**-0.17 [-0.56, 0.22]**

Heterogeneity: Tau² = 0.07; Chi² = 5.78, df = 3 (P = 0.12); I² = 48%
Test for overall effect: Z = 0.86 (P = 0.39)



group with some other intervention. The control interventions included: 1) Child Centered Therapy 2) Non-directive Supportive therapy, 3) Support intervention for parents and 4) Eye Movement Desensitization and Reprocessing therapy (EMDR). At the Cohen's *et al*. [41] study no total PTSS score was offered and the re-experiencing score was used instead. The total number of participants in meta-analyses was 147 at the experimental group and 140 at the control group. As Table **3** shows the weighted mean effect size implies no positive changes in PTSS among experimental group compared to control group (Cohen's d= -0.17, Z=0.86, p=.39). The effect size was not statistically significant and did not exceed .20, which is the smallest effect size that has any significant practical or clinical meaning [36]. The confidence interval for weighted mean effect size included zero, indicating that the associated effectiveness cannot be warranted. There was no statistical heterogeneity (x^2 = 5.78, p= .12) between the studies.

Three studies compared the effects of two different kind of CBT-based therapies. They were thus excluded from the meta-analysis but offer some additional evidence of combining different treatment elements to traditional CBT. In a study of Deblinger *et al*. [47] the Trauma Focused Cognitive Behavioural Therapy (TF-CBT) with and without narrative component was compared. The study showed that TF-CBT, regardless of the number of sessions or the inclusion of a trauma narrative (TN) component, was effective in improving participant's mental health in general. However, the TN component seemed to especially correlate with the reduced abuse-related fear and general anxiety among children. In the study of Cohen *et al*. [42] the potential benefits of combining a selective serotonin reuptake inhibitor, sertraline, to TF-CBT was examined. It was evidenced that there was only minimal benefit to adding sertraline concerning all symptoms. Further, in the study of Pifalo [59] art therapy and cognitive behavioral therapy were combined. It was concluded that a combined treatment model was beneficial to symptom reduce among sexually abused children.

CONCLUSIONS

Large number of intervention studies and meta-analyses has been conducted of child sexual abuse [23, 61]. Between 2000 and 2013 the total of 23 intervention studies have been published. The amount of intervention studies among sexually abused children is relatively large compared the studies among children exposed to other traumas (for review of military trauma see [62] and community violence, see [23]). However, Coren *et al*. [27] emphasize that intervention reviews have a varying quality and that the lower quality evidence should be treated with more caution than higher quality evidence.

Efficacy of Interventions and the Methodological Issues

The main finding of this meta-analysis was that sexually abused children benefitted from psychosocial interventions. Post traumatic stress symptoms diminished more among children who attended intervention compared to the children who received no help at all. However, when comparing the children attending intervention with most empirical evidence so far (namely CBT) and children attending some other intervention, the differences in recovery were not that clear. Thus, the CBT intervention's superiority to other interventions cannot be warranted. Due to variation in research methodology (including the study inclusion criteria and effect size calculations) it is difficult to draw firm conclusions about comparisons between the current and earlier meta-analysis. However, some of the main similarities and differences in results are outlined with notions of methodological choices.

The results of the present study support the findings of earlier reviews showing the overall effectiveness of interventions (for example [21, 22]). However, the

results are not in line with two Cochrane reviews [24, 25] showing that the reduction of PTSS was significantly better among children participating in CBT-based interventions than among control group children. It is noteworthy, that in the interventions included in these two Cochrane reviews, the control groups consisted of "treatment as usual" condition and "no treatment" condition. This is somehow opposite with the present study where all control groups, which were compared to CBT groups, received some other intervention. Also, results of the current study differ with the Harvey & Taylor's [19] meta-analysis where the type of a therapy is treated as a moderator. Their results revealed that cognitive-behavioral and insight oriented therapies had a larger effect compared to other therapies. However, it is noteworthy that in the Harvey & Taylor's [19] study the results were achieved by pooling the independent samples and repeated measures into one analysis treating the independent samples as repeated measures (i.e. discarding the control group data). When the Trask *et al*. [22] conducted a moderator analysis in between-subject design the treatment effects were not significantly larger for cognitive behavioural treatments compared to other interventions. Likewise, Hetzel-Riggin *et al*. [20] concluded that supportive and cognitive-behavioral therapies were equally effective in alleviating the behavioral problems. Taken together, the present review added the evidence of meta review [27]suggesting that the evidence for the effectiveness of CBT is less robust than expected.

The results show that it is not meaningless how to conduct the meta-analysis. The single group design omits the effect of natural healing, which is addressed in between group designs. Moreover, the homogeneity of control groups among interventions to be included in the meta-analysis is important. From the clinical point of view it is to the utmost importance whether the intervention at hand is compared to other form of therapy or no-treatment condition or whether these different types control groups are mixed in the analysis.

Some cautions should be made in interpreting the results concerning CBT-based and other psychosocial interventions. First, it should be kept in mind that the non-significant result comparing CBT and other therapies does not imply the lack of efficacy of CBT-based methods but rather a similar efficacy with other interventions. Second, the sample size in the meta-analysis comparing any psychosocial intervention groups and no treatment control groups was considerable lower than in the analysis comparing CBT and other interventions. In small sample studies, there is always an increased risk for a statistically significant result being "falsely positive" [63]. Third, most of the CBT interventions were manualized while most of the other therapies were not. Cohen *et al*. [21] argue that it is impossible to adequately evaluate the intervention effectiveness in cases where the clear treatment manual is lacking, because manuals guarantee the standardized use and implementation of interventions. The question remains whether the CBT-based interventions were more commensurate with each other compared to other psychosocial interventions. Fourth, CBT remain as the only intervention type exceeding the highest grade in evaluation of therapy effectiveness among sexually abused children. This is consistent with the Silverman *et al*. [64] study concerning treatments for children exposed to traumatic events in general. Taken together, the whole picture of intervention effectiveness or even efficacy is not achieved until other intervention types reach the same quality of evidence as CBT already has.

Limitations of the Study

There are also some limitations in this review. Some relevant studies may have been ignored due to the strict criteria of including only published scientific reports and well-defined/time specific intervention studies. For example the dissertations of Dominguez [65] Brown [66] and Hsu [67] evaluated the treatments for CSA, but were omitted. Three studies [68-70] were excluded because they focused on outcomes of large scale programmes with multiple treatment modalities and high variability of treatment duration among participants. For example in the study of Coren *et al*. [69] eight intervention projects with various types of services including counseling, play therapy, CBT and other psychotherapies were evaluated. Also several studies were excluded because the main purpose of the study was not alleviate the mental health consequences of sexual abuse although many of the participants had the history of abuse. For example, the study of Krakow *et al*. [71] was developed to reduce the nightmares of adjudicated girls. All but one of them were also sexually abused.

The more detailed assessment of the methodological quality, such as the checklist developed by Downs & Black [29], may have specified the nature of the heterogeneous studies included in this review. Also, the more detailed coding system of different elements of the included studies and moderator

analysis based on these differences may have offered richer information (see for example [22]). The number of studies eligible for the meta-analysis is still very low but when the evidence in the field of child sexual abuse interventions have further accumulated, this kind of methods are worth using. The results of this review should be regarded as tentative and suggestive and further elaboration of the constantly growing evidence is needed.

Clinical Implications

The present review highlights four important issues in tailoring the interventions among sexually abused children: (1) the developmental, (2) the symptom related (3) the "nature of trauma" -related and (4) timing related issues.

First, the review of developmental aspects of interventions among sexually abused children is not yet possible. Among included studies, there was a high variability among the age of participants as well as the timing of abuse in relation to the onset of the intervention. The questions of age related problems and intervention methods are however at utmost importance. The meaning of abusive experiences to the child is related to his/hers cognitive capacity. Along with the growing cognitive and emotional capacity the new aspects of sexual experience, such as anxiety and shame, may emerge. This means that the negative effect of sexual abuse may actualize later in life [72]. More research is needed in order to tackle the important issue of timing of the intervention and the best practices among pre-school and school age children as well as among teenagers.

Second, none of the included studies shed a light on the issue of differential recovery on high versus low symptomatic children. The majority of the interventions focused on children with clinically significant psychiatric symptoms, such as diagnosed PTSD. As noted above, children with relatively low levels of acute symptoms may suffer later in life, and preventive interventions are needed. The knowledge of factors that contribute to a child's resilience after experiences of maltreatment should be utilized in preventive work. They include individual characteristics (e.g. self-regulatory processes), family context (e.g. supportive parenting), and experiences in the broader environment (e.g. close friendships) [13, 73].

Third, the nature of trauma should more elaborately be taken under the scope when planning, and implementing the interventions. Maniglio [3] remarks, that child sexual abuse should be considered as a general, nonspecific risk factor for psychopathology. Clearly, the methods used in helping sexually abused children are to great extent the same as in helping children exposed to other traumas. However, the meaning of developmental level of the child, for example, may be more pronounced in sexual abuse than in other traumas. In future, it is highly recommended that the most effective methods from wide array of preventive and intervention techniques would be filtered out and the guidelines for differentially affected children could be offered.

Fourth, in earlier reviews longer interventions have been found to associate with greater treatment gains [22]. In this review CBT-based interventions had 4-12 sessions, typically 45 minutes each, while other interventions had 20-30 sessions lasting 1.5 to 2 hours. The findings of present review suggest that certain cautiousness needs to adhere in having small amount of sessions even if the preliminary results support the effectiveness of some technique.

The idea behind the evidence based health care is that the limited resources must be targeted only to the most effective processes [74]. The effectiveness research should follow from successful efficacy research. This means that the interventions should be implemented into the real-world conditions followed by research with heterogeneous and representative samples. The message for practitioners and policy makers, derived from this review, is that there is no need to reinventing the wheel when building the services for sexually abused children. Even if the gaps in knowledge still exist, there is a wide variety of evidence supported intervention options to be chosen and to be tailored in one's own agency. This presumes, however, that professionals in different fields of child protection, as well as the policy makers, see scientific evidence as critical criteria for practice selection, and keep themselves updated with the research findings. By doing this, the limited resources can be used as effectively as possible.

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