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Published on: 01 Jun 2013 - International Journal of Public Health (SP Birkhäuser Verlag Basel)

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The current prevalence of child sexual abuse worldwide: a systematic review and meta-analysis

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Received: 5 March 2012/Revised: 25 October 2012/Accepted: 29 October 2012/Published online: 21 November 2012
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Abstract

Objectives Systematic reviews on prevalence estimates of child sexual abuse (CSA) worldwide included studies with adult participants referring on a period of abuse of about 50 years. Therefore we aimed to describe the current prevalence of CSA, taking into account geographical region, type of abuse, level of country development and research methods.

Methods We included studies published between 2002 and 2009 that reported CSA in children below 18 years. We performed a random effects meta-analysis and analyzed moderator variables by meta-regression.

Results Fifty-five studies from 24 countries were included. According to four predefined types of sexual abuse, prevalence estimates ranged from 8 to 31 % for girls and 3 to 17 % for boys. Nine girls and 3 boys out of 100 are victims of forced intercourse. Heterogeneity between primary studies was high in all analyses.

Conclusions Our results based on most recent data confirm results from previous reviews with adults. Surveys in children offer most recent estimates of CSA. Reducing heterogeneity between studies might be possible by

standardized measures to make data more meaningful in international comparisons.

Keywords Child sexual abuse · International · Epidemiology · Prevalence · Systematic review · Meta-analysis

Introduction

The devastating long- and short-term consequences of child sexual abuse (CSA) on the lives of the victims are reflected in the high public and scientific interest on this topic (Bolen and Scannapieco 1999; Edgardh 2002; Pereda et al. 2009a). The need for reliable overall prevalence estimates of CSA is crucial for health research worldwide, especially for allocating economic resources in health care and estimating the burden.

Two recent meta-analyses consistently showed CSA prevalence of 18–20 % for women and 8 % for men worldwide (Stoltenborgh et al. 2011; Pereda et al. 2009b). The narrative review of Andrews et al. (2004) reports that 8.4–67.7 % of females and 3.8–35 % of males have been sexually abused during childhood. This wide range is only partly attributed to the geographical region where the study was conducted. Several studies found a higher prevalence in Africa than elsewhere but inconsistent findings exist with regard to other regions (Pereda et al. 2009b; Andrews et al. 2004; Stoltenborgh et al. 2011; Finkelhor 1994). Moreover, Stoltenborgh et al. (2011) analyzed the effect of the level of economic development of a country on CSA prevalence. They found that for boys, the prevalence was higher in low-resource countries than in high-resource countries, whereas no significant effects of the country's economic development level emerged for girls.

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Some authors argue that different prevalence estimates of CSA are the result of differences in methodology of the primary studies (Bolen and Scannapieco 1999; Edgardh and Ormstad 2000; Dhaliwal et al. 1996; Gorey and Leslie 1997; Finkelhor 1994). A higher prevalence of CSA is suggested to be associated with sample type (i.e. college populations), CSA definition and the number of questions asked in combined prevalence estimates (Andrews et al. 2004). However, another meta-analysis showed no influence of the definition of CSA (broad vs. narrow) on the pooled CSA prevalence (Pereda et al. 2009b). In addition, Stoltenborgh et al. (2011) found that number of questions affected pooled prevalence for girls but not for boys.

Whether the prevalence of CSA changes over time is a matter of controversy: some researchers found a decrease of CSA from the mid-1990s to 2005 (Gilbert et al. 2009), whereas others did not find a significant variation over time (Goldman and Padayachi 2000). If such change in prevalence rates over time exists, summarizing prevalence estimates of different time points might be problematic. Previous reviews are mainly based on primary studies which were published in a broad time range (e.g. 1980 until now) and include both studies with adults and studies with children. A study with adults from the 1980s assesses CSA prevalence in the 1950s, whereas a study with children in 2009 assesses more recent prevalence rates. Moreover, studies with adults may be more prone to potential recollection bias than studies on children (Andrews et al. 2004; Halperin et al. 1996), which is a further source of bias if they are mixed in a meta-analysis.

The aim of this study is to summarize the prevalence of CSA worldwide using the most current data. To achieve that, we include only papers published after 2002 and reporting on data collected from 2000 onwards. Furthermore, we only include studies with child and/or adolescent populations at the time of the study, in order to reduce recollection bias. The results will be presented stratified for gender and type of abuse, which was not applied in earlier meta-analyses. In addition, using meta-regression, we will examine how methodological aspects (i.e. design of study, method of data collection, sampling method) and contextual factors (i.e. Human Development Index (HDI), region) might explain the variation between studies.

Methods

Literature review

A systematic literature search took place in February 2009. We searched electronic literature databases (Embase, Medline, PsycInfo and Psynindex) and identified 4,827 potentially eligible studies. The search terms combined

concepts of the population (child or adolescent), the incident (sexual abuse, assault, molestation) and the study type (epidemiology, prevalence, proportion). After removal of duplicates, we were left with 3,295 potentially relevant studies. In addition, we consulted 75 experts on CSA from 75 different countries, who in turn provided us with names and contact details of other experts, whom we additionally consulted. These experts were asked to revise our list of included studies and to point us towards studies from their region which we might have missed. This resulted to the identification of one additional study. Grey literature and unpublished reports were not included in this study.

Study selection

We included only empirical studies reporting the prevalence of CSA for which the data were collected after 2000 and in which the participants were below 18 years old. We excluded case studies and studies for which the country was unknown and the sample size was below 1,000. The latter criterion was applied to exclude studies with low statistical precision *and* low reporting quality ($N = 178$). After abstract screening, 3,082 studies were excluded, leaving 213 for full-text screening (see “Appendix”) applying the same criteria. We were unable to retrieve nine publications, most of which were dissertations. We managed to translate most articles that were published in languages other than English, apart from one publication in Lithuanian. Twelve studies presented data from the same populations in several publications. These publications are marked with ¹ in the reference list and were analyzed as one study each. One publication that reported outcomes separately for community samples and for schools, and one that reported outcomes separately for two different countries were considered as reporting two different studies (Ruangkanchanasetr et al. 2005; Seedat et al. 2004). Two studies that presented mixed results for child sexual and physical abuse were excluded. In nine publications, the data were presented in a way that made it impossible for us to extract the necessary information. The final list of included studies consists of 55 studies reported in 65 publications, presenting information about CSA in 24 countries (see ² in the list of references, and Fig. 3 for a flowchart of the process of study selection).

Data extraction

We extracted descriptive characteristics (e.g. publication date, year of data collection, age of the sample, gender). As outcomes we coded prevalence rates according to the type

¹ In references ** included as secondary source

² In references * included as primary source

of abuse. Four categories of CSA were used to come to estimates for very different events: *non-contact abuse* (inappropriate sexual solicitation, indecent exposure), *contact abuse* (touching/fondling, kissing), *forced intercourse* (oral, vaginal, anal, attempted) and *mixed sexual abuse* (when different types of abuse had been inquired but only one prevalence rate was reported or the type of abuse not specified). Our categorization of CSA differs from earlier reviews which used more vague distinction (e.g. narrow vs. broad definition) since we aimed to reduce variation of outcome between studies.

As contextual moderators, we extracted data on (a) the region where the study was conducted and (b) the degree of development in this region according to the HDI ranging from 0 to 1 with higher values indicating better development (Human Developmental Report 2009). We extracted three methodological moderators: (a) design of study (primarily cross-sectional or cross-sectional nested in a longitudinal study); (b) sampling method (random sample from the general population, school-based or other specific population); (c) number of items used for the assessment of CSA; and (d) method of data collection (self-report, interview by researcher, official registries).

Prevalence rates were stratified according to type of sexual abuse and gender. Depending on the information available for each study, we report prevalence on the total sample or separately on boys and girls (see Table 1). In cases where CSA is reported separately for boys and girls but there is no information about the total number of boys and girls in the sample, we assumed that half of the participants were male and half female.

Analysis procedures

Prevalence estimates were computed using the following logit transformation $z = \ln\left(\frac{p}{1-p}\right)$ with p denoting the proportion of sexually abused in the sample.

We measured prevalence estimates of CSA for each study by stratifying by gender and type of abuse. Based on the information gained from previous reviews and meta-analyses on CSA (Pereda et al. 2009b; Finkelhor 1994; Andrews et al. 2004), we assumed relatively high between-study heterogeneity resulting from moderator variables such as methodological differences between the primary studies. Therefore, we used random effects models for all summary statistics because this method explicitly allows for between-study variability (Higgins and Thompson 2002; Higgins et al. 2003). When there were less than five studies included in the pooled analysis, we interpreted the pooled results using the 95 % confidence interval (CI). Confidence intervals give an idea of where the true value of the prevalence of CSA lies. When there were five or more studies available in the category of interest, we report on the prediction interval

(PI) which gives information about the expected prevalence of a new study in this field. Confidence and prediction intervals are only reported if the upper value is below 0.50; meaning in other cases we only give the information of non-applicability of prediction interval information (n.a.). Heterogeneity among studies was examined using the I^2 statistic (range 0–100 %), which describes the percentage of total variation across studies that is attributable to heterogeneity between studies rather than chance (Higgins and Thompson 2002; Higgins et al. 2003). In other words, the variation of prevalence rates of primary studies is compared with the expected statistical variation. I^2 values of 25, 50 and 75 % were considered as low, moderate and high levels of heterogeneity, respectively.

As we expected high heterogeneity between studies, we assessed the impact of methodological moderator variables (i.e. sampling method) and contextual factors (i.e. HDI) on the pooled prevalence estimates in meta-regression analyses. Formal tests for interaction using meta-regression were done to compare stratum-specific prevalence rates. All analyses were carried out in Stata Release 10 (StataCorp LP, College Station, TX, 2007). The number of studies was only sufficient to calculate pooled estimates for forced intercourse and mixed sexual abuse, but not for contact and non-contact abuse.

Results

Study characteristics

The majority of the studies were conducted in Asia (16) and North America (14). Eleven studies came from Europe, 9 from Africa, and five studies were carried out in Central and South America. No article from Australia or New Zealand was eligible for our review, mostly due to the use of adult samples in the studies conducted in these countries. Table 1 depicts the main characteristics of the studies and Table 2 gives an overview of methodological aspects of the studies. The sample sizes ranged from 106 to 127,097, with an average of approximately 7,500. More precisely, 23 studies had a sample size of up to 1,000 children, 27 between 1,001 and 10,000 children and five studies with more than 10,000. Seven of them included only females and eight only males. None of the studies reported on the prevalence of CSA in populations younger than 13. In the majority of studies, a cross-sectional design was used. Most of the samples were recruited in schools and were evaluated using self-report instruments which contained 1–15 questions. Fifty-four percent of the studies was conducted in countries with a high HDI. Thirty studies reported on mixed sexual abuse or did not define the type of abuse, and 23 studies reported on forced intercourse.

Table 1 Descriptive information of included studies ($N = 55$)

References	Total (N)	Male (%)	Female (%)	Age (mean or range)	Region	HDI*	Year of data collection	Type of prevalence	Prevalence rate by gender and type of abuse		
									Male	Female	Total
Aberle et al. (2007)	2,140	40	60	14–18	Croatia	High	2005	Lifetime prevalence	6.0 ^b	3.3 ^b	3.3 ^b
Alikasifoglu et al. (2006)	1,871	0	100	16.3	Turkey	Medium	2000	Lifetime prevalence	11.3 ^b	4.9 ^c	11.3 ^b
Andersson and Ho-Foster (2008)	127,097	100	0	15	South Africa	Medium	2002	Lifetime prevalence	47 ^c	29.0 ^b	29.0 ^b
Aslund et al. (2007)	5,048	50.45	49.54	15–17	Sweden	High	2004	Lifetime prevalence	6.8 ^c	12.5 ^c	12.5 ^c
Assis et al. (2004)	1,685	44.3	55.6	11–19	Brazil	High	2000	Lifetime prevalence	2.1 ^c	11.8 ^d	11.8 ^d
Audu et al. 2009	316	0	100	14.9	Nigeria	Low	Unclear	Lifetime prevalence	23 ^d	47.7 ^{c*}	47.7 ^{c*}
Banerjee et al. (2008)	330	14.8	85.1	8–14	India	Medium	Unclear	Lifetime prevalence	9.4 ^c	3.9 ^{d*}	3.9 ^{d*}
Banyard and Cross (2008)	2,101	49	51	<18	USA	High	2000–2001	Lifetime prevalence	16.8 ^c	13.2 ^c	13.2 ^c
Birdthistle et al. (2008)	863	0	100	16.8	Zimbabwe	Low	2004	Lifetime prevalence	8.1 ^c	8.1 ^c	8.1 ^c
Bonino et al. (2006)	804	58	42	14–19	Italy	High	Unclear	Lifetime prevalence	5.9 ^c	9.0 ^c	8.0 ^c
Champion et al. (2004)	106	Unclear	Unclear	14–19	Mexico	High	Unclear	Lifetime prevalence	18.0 ^c	18.0 ^c	18.0 ^c
Chen et al. (2003)	239	100	0	17.53	China	Medium	2002	Lifetime prevalence	2.1 ^c	2.1 ^c	2.1 ^c
Chen et al. (2004b)	2,300	49.8	50.2	17.2	China	Medium	Unclear	Lifetime prevalence	8.8 ^a	12.9 ^a	10.9 ^a
Chen (2004)	565	50	50	17	China	Medium	2003	Lifetime prevalence	2.8 ^b	6.5 ^b	4.7 ^b
Chen et al. (2006)	351	0	100	17.6	China	Medium	2004	Lifetime prevalence	1.6 ^c	2.3 ^c	2.0 ^c
Cheng-Fang et al. (2008)	1,684	49.1	50.9	14.1	Taiwan	Medium	2003	Lifetime prevalence	10.5 ^d	16.7 ^d	13.6 ^d
Dassa et al. (2005a, b)	2,400	50	50	<16	Togo	Medium	2003	Lifetime prevalence	14.3 ^d	20.0 ^d	20.0 ^d
Decker et al. (2007)	5,919	0	100	14–17	USA	High	2001, 2003	Lifetime prevalence	17.4 ^a	9.1 ^b	17.4 ^a
Doocy et al. (2007)	263	58	42	1–16	Nepal	Medium	Unclear	Lifetime prevalence	5.4 ^c	5.4 ^c	5.4 ^c
Eisenberg et al. (2007)	124,881	48.9	51	11–18	USA	High	Unclear	Lifetime prevalence	21.9 ^d	2.0 ^d	2.5 ^d
Elbedour et al. (2006)	217	Unclear	Unclear	16	Israel	Medium	2000	Specific age range prevalence	4.9 ^{d*}	14.0 ^c	14.0 ^c
									2.9 ^b	7.9 ^b	1.0 ^{d*}
									16.0 ^a	16.0 ^a	16.0 ^a
									14.0 ^b	14.0 ^b	14.0 ^b
									4.0 ^c	4.0 ^c	4.0 ^c

Table 1 continued

References	Total (N)	Male (%)	Female (%)	Age (mean or range)	Region	HDI*	Year of data collection	Type of prevalence	Prevalence rate by gender and type of abuse		
									Male	Female	Total
Fabjanic et al. (2002)	310	46.13	53.87	Unclear	Croatia	High	2001	Lifetime prevalence	5.0 ^d	18.0 ^d	11.0 ^d
Haavet et al. (2005)	7,329	Unclear	Unclear	15–16	Norway	High	2000–2001	Specific age range prevalence			5.8 ^{d*}
Harrison and Narayan (2003)	50,168	49.3	50.7	15	USA	High	2001	Lifetime prevalence	4.0 ^b	10.5 ^b	
Hasnain and Kumar (2006)	150	0	100	Unclear	India	Medium	Unclear	Lifetime prevalence		38.0 ^d	
Helweg-Larsen and Boving Larsen (2006)	5,829	49.9	50.06	15–16	Denmark	High	2002	Lifetime prevalence	1.1 ^{d*}	4.4 ^{d*}	
Kim and Kim (2005)	1,053	52.99	47	12–18	Korea, Republic of	High	2001–2002	Lifetime prevalence	0.4 ^c	5.2 ^c	
Leung et al. (2008)	6,592	49.9	50.1	14.68	China	Medium	2005	Specific age range prevalence			0.6 ^b
Lien et al. (2007)	7,305	Unclear	Unclear	12–17	Norway	High	2000, 2001	Specific age range prevalence	2.0 ^{d*}	6.0 ^{d*}	3.9 ^{d*}
Mitchell et al. (2008)	1,500	48.9	50.13	10–17	USA	High	2005	Specific age range prevalence			13.4 ^a
Moran et al. (2004)	2,164	54	46	Unclear	USA	High	Unclear	Lifetime prevalence			11.7 ^d
Ndetei et al. (2007)	1,110	56.6	43.3	16.6	Kenya	Medium	Unclear	Lifetime prevalence			16.5 ^d
Orozco et al. (2008)	3,005	49.3	50.1	12–17	Mexico	High	2005	Lifetime prevalence	0.6 ^c	2.0 ^c	1.3 ^c
Polanczyk et al. (2003)	1,193	45.6	54.4	13–20	Brazil	High	2000	Lifetime prevalence	1.7 ^d	7.7 ^d	4.7 ^d
Rosenberg et al. (2005)	16,664	49	51	13–18	USA	High	2001	Specific age range prevalence	2.0 ^d	2.5 ^d	2.3 ^d
Ruangkanchanasetr et al. (2005)	426	41	59	15.5	Thailand	Medium	2001	Specific age range prevalence	5.0 ^e	8.0 ^e	3.1 ^{e*}
Ruangkanchanasetr et al. (2005)	426	41	59	15.5	Thailand	Medium	2001	Specific age range prevalence			1.4 ^{e*}
Sears et al. (2007)	633	51.18	48.82	14.64	Canada	High	Unclear	Lifetime prevalence	38.0 ^d	44.0 ^d	
Seedat et al. (2004)	1,140	43.3	41.9	15.9	South Africa	Medium	2000	Lifetime prevalence	15.0 ^d	12.0 ^d	14.0 ^d
Seedat et al. (2004)	901	56.7	58.1	15.6	Kenya	Medium	2000	Lifetime prevalence	24.0 ^d	14.0 ^d	18.0 ^d
Sesar et al. (2008)	318	19.1	80	15–20	Croatia	High	2003	Lifetime prevalence	21.0 ^{d*}	13.0 ^{d*}	
Swahn and Bossarte (2007)	13,639	52.31	47.69	<18	USA	High	2005	Lifetime prevalence	3.8 ^e	10.7 ^e	7.3 ^e
Taquette et al. (2005)	173	0	100	16.5	Brazil	High	2001–2002	Lifetime prevalence		11.6 ^c	
Thurman et al. (2006)	1,172	51.6	48.3	14–18	South Africa	Medium	2001	Lifetime prevalence	0.4 ^c	8.7 ^c	3.9 ^c
Turner et al. (2007)	1,000	Unclear	Unclear	10–17	USA	High	2002–2003	Specific age range prevalence			13.6 ^d

Table 1 continued

References	Total (N)	Male (%)	Female (%)	Age (mean or range)	Region	HDI*	Year of data collection	Type of prevalence	Prevalence rate by gender and type of abuse		
									Male	Female	Total
Witkowska and Menckel (2005)	540	0	100	17–18	Sweden	High	2001	Specific age range prevalence	61.0 ^a	27.0 ^b	0.2 ^c
Wolitzky-Taylor et al. (2008)	3,614	Unclear	Unclear	12–17	USA	High	2005	Lifetime prevalence			1.6 ^d
Worku et al. (2006)	323	0	100	12–20	Ethiopia	Low	2005	Lifetime prevalence	35.3 ^a	12.4 ^c	68.7 ^d
Yang et al. (2004)	282	44.6	55.3	14.3	China	Medium	Unclear	Lifetime prevalence	0.0 ^e *	0.0 ^e *	
Ybarra et al. (2004)	1,501	52	48	14.15	USA	High	1999, 2000	Specific age range prevalence	12.0 ^a	27.0 ^a	
Ybarra et al. (2007)	1,588	52	48	12.6	USA	High	2006	Specific age range prevalence			14.0 ^e *
Young et al. (2008)	1,017	45.5	54.5	14	USA	High	2005	Lifetime prevalence	40.9 ^a	67.3 ^a	26.2 ^b
Ystgaard et al. (2003)	4,060	51.48	48.52	<16	Norway	High	2000–2001	Lifetime prevalence	6.1 ^c	11.5 ^c	26.6 ^d
Zolotor et al. (2008)	1,300	49.6	50.4	10–17	Georgia	Medium	2008	Lifetime prevalence	2.5 ^d *	10.7 ^d *	7.3 ^d
Zoroglu et al. (2003)	839	38.9	61.1	15.9	Turkey	Medium	Unclear	Lifetime prevalence	6.7 ^d	13.3 ^d	

^a No contact abuse (inappropriate sexual solicitation, indecent exposure)

^b Contact abuse (touching/fondling/kissing)

^c Intercourse (oral, vaginal, anal, attempted intercourse)/sexual violence

^d Mixed type of sexual abuse/type of abuse not specified

^e Other type of abuse

* Below 16

Table 2 Methodological study characteristics

References	Response rate	Sampling	Method of data collection	No of items CSA
Aberle et al. (2007)	Unclear	From schools	Self-report	2
Alikasifoglu et al. (2006)	95.7	From schools	Self-report	4
Andersson and Ho-Foster (2008)	Unclear	From schools	Self-report	4
Aslund et al. (2007)	80	From schools	Self-report	2
Assis et al. (2004)	99.9	From schools	Self-report	6
Audu et al. 2009	90.3	Specific population	Interview by researcher	Unclear
Banerjee et al. (2007)	Unclear	Specific population	Interview by researcher	Unclear
Banyard and Cross (2008)	Unclear	From schools	Self-report	1
Birdthistle et al. (2008)	67.26	General population	Interview by researcher	Unclear
Bonino et al. (2006)	100	From schools	Self-report	2
Champion et al. (2004)	99.98	General population	Self-report	5
Chen et al. (2003)	83.3	From schools	Self-report	10
Chen (2004)	Unclear	From schools	Self-report	Unclear
Chen et al. (2004)	75.9	From schools	Self-report	12
Chen et al. (2006)	80.7	From schools	Self-report	12
Cheng-Fang et al. (2008)	81	From schools	Self-report	3
Dassa et al. (2005a, b)	Unclear	General Population	Self-report	Unclear
Decker et al. (2007)	96	From schools	Self-report	1
Doocy et al. (2007)	Unclear	Specific population	Self-report	Unclear
Eisenberg et al. (2007)	55–76	From schools	Self-report	2
Elbedour et al. (2006)	80.4	From schools	Self-report	10
Fabijanic et al. 2002	Unclear	From schools	Self-report	14
Haavet et al. (2005)	88	From schools	Self-report	1
Harrison and Narayan (2003)	73.3	From schools	Self-report	2
Hasnain and Kumar (2006)	Unclear	From schools	Self-report	Unclear
Helweg-Larsen and Boving Larsen (2006)	94	General population	Self-report	15
Kim and Kim (2005)	87.5	From schools	Self-report	2
Leung et al. (2008)	99.7	From schools	Self-report	2
Lien et al. (2007)	88	From schools	Self-report	1
Mitchell et al. (2008)	Unclear	Specific population	Interview by researcher	3
Moran et al. (2004)	72	From schools	Self-report	1
Ndetei et al. (2007)	Unclear	From schools	Self-report	Unclear
Orozco et al. (2008)	71	General population	Self-report	2
Polanczyk et al. (2003)	99	From schools	Self-report	3
Rosenberg et al. (2005)	71	From schools	Self-report	1
Ruangkanchanasetr et al. (2005)	Unclear	General population	Self-report	Unclear
Ruangkanchanasetr et al. (2005)	Unclear	From schools	Self-report	Unclear
Sears et al. (2007)	Unclear	From schools	Self-report	3
Seedat et al. (2004)	Unclear	From schools	Self-report	Unclear
Seedat et al. (2004)	Unclear	From schools	Self-report	Unclear
Sesar et al. (2008)	Unclear	From schools	Self-report	Unclear
Swahn and Bossarte (2007)	67	From schools	Self-report	1
Taquette et al. (2005)	Unclear	Specific population	Interview by researcher	Unclear
Thurman et al. (2006)	95	General population	Self-report	Unclear
Turner et al. (2007)	79.5	General population	Interview by researcher	7
Witkowska and Menckel (2005)	Unclear	From schools	Self-report	7
Wolitzky-Taylor et al. (2008)	53	General population	Interview by researcher	Unclear
Worku et al. (2006)	Unclear	From schools	Self-report	Unclear

Table 2 continued

References	Response rate	Sampling	Method of data collection	No of items CSA
Yang et al. (2004)	99.9	From schools	Self-report	Unclear
Ybarra et al. (2004)	82	Specific population	Self-report	3
Ybarra et al. (2007)	26	Specific population	Self-report	3
Young et al. (2008)	68.1	From schools	Self-report	10
Ystgaard et al. (2003)	91.2	From schools	Self-report	Unclear
Zolotor et al. (2008)	99.5	From schools	Interview by researcher	10
Zoroglu et al. (2003)	Unclear	From schools	Self-report	Unclear

Thirty-two studies were included in the meta-analyses: sixteen reported on forced intercourse and 19 on mixed type of CSA in females, whereas 10 reported on forced intercourse and 16 on mixed type of CSA in males.

Prevalence estimates of child sexual abuse

Pooled prevalence estimates of CSA by gender and type of abuse

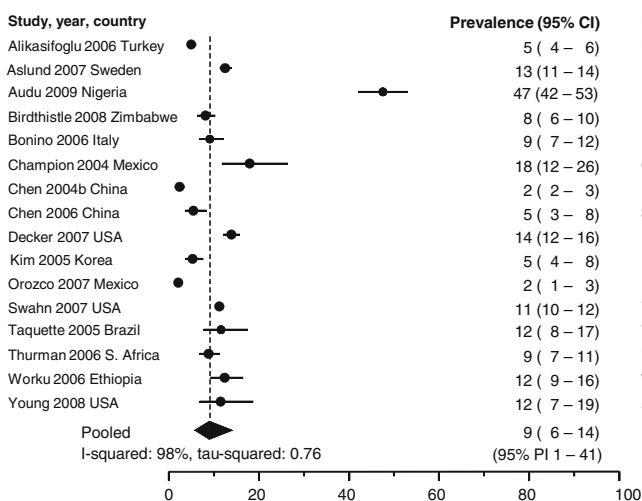
Based on four types of sexual abuse, prevalence estimates ranged from 0 to 69 % for girls and 0 to 47 % for boys

(Table 1). For girls, the pooled prevalence estimate was 9 % for forced intercourse (CI 6–14 %; PI 1–41 %) and 15 % for mixed sexual abuse (CI 9–24 %; PI n.a.) (Fig. 1).

For boys, the pooled prevalence estimate was 3 % for forced intercourse (CI 1–9 %; PI n.a.) and 8 % for mixed sexual abuse (CI 4–16 %; PI n.a.) (Fig. 2). The heterogeneity of primary studies was high ($I^2 = 98–100 %$).

For non-contact abuse (nine studies), we found pooled prevalence estimates of 17 % (CI n.a.) for males and 31 % (CI n.a.) for females below 18 years of age. The prevalence estimates for contact abuse (11 studies) were 6 % for males (CI 2–16 %) and 13 % (CI 8–21 %) for females.

A: Intercourse



B: Mixed

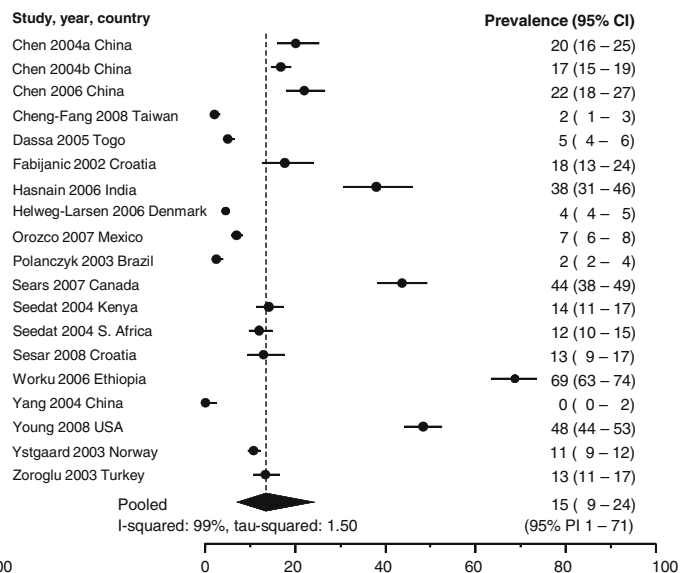


Fig. 1 Prevalence of child sexual abuse for girls below 18 years from international studies stratified for type of abuse (intercourse and mixed type). Pooled prevalence estimate and heterogeneity statistics at bottom of figure. **a** Lists studies that reported prevalence estimates of girls below 18 forced to intercourse. **b** lists studies that report on prevalence estimates of girls below 18 being victims of mixed type of abuse. On the *right hand side* of the figures the confidence intervals

(CI) at a 95 % level and in braces the prediction intervals (PI) to give an expected estimate for a new study on this topic. The prevalence estimate for forced intercourse is 9 % (CI 6–14 %) and for mixed sexual abuse 15 % (CI 9–24 %). Studies were published between 2002 and 2009 with data from 24 countries worldwide that reported child sexual abuse for girls

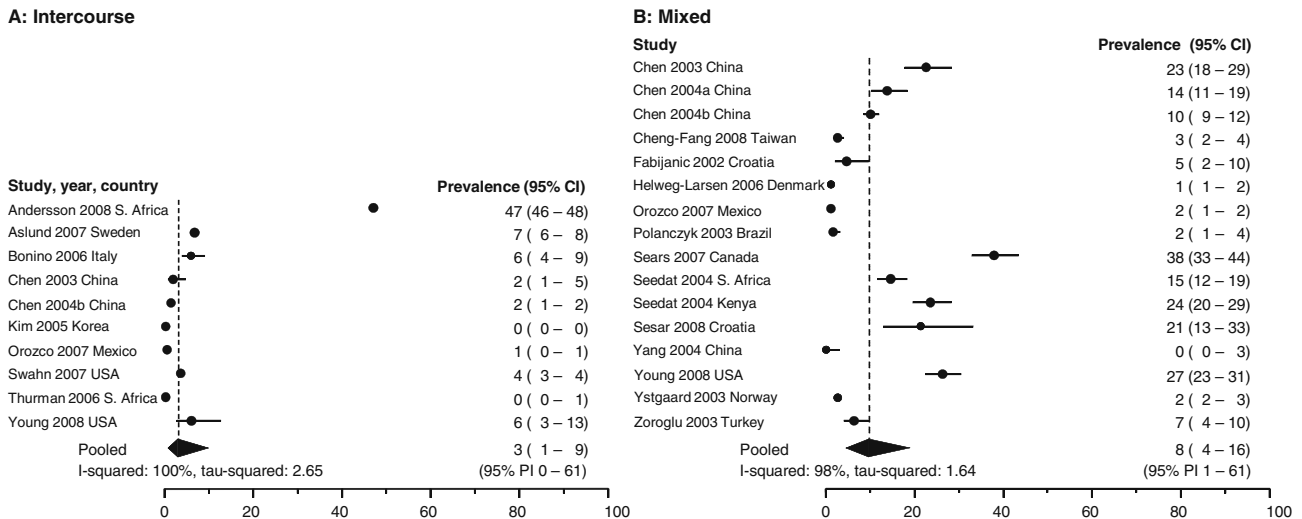


Fig. 2 a Lists studies that reported prevalence estimates of boys below 18 forced to intercourse. b Lists studies that report on prevalence estimates of girls below 18 being victims of mixed type of abuse. On the right hand side of the figures the confidence intervals (CI) at a 95 % level and in braces the prediction intervals (PI) to give

an expected estimate for a new study on this topic. The prevalence estimate for forced intercourse is 3 % (CI 1–9 %) and for mixed sexual abuse 8 % (CI 4–16 %). Studies were published between 2002 and 2009 with data from 24 countries worldwide that reported child sexual abuse for boys

Table 3 Moderator analysis of contextual and methodological characteristics of the studies

Potential effect modifier	Forced intercourse		Mixed type of abuse	
	Male (<i>p</i>)	Female (<i>p</i>)	Male (<i>p</i>)	Female (<i>p</i>)
Region (Africa, Asia, Europe, North-America, Central and South America)	0.65	0.21	0.32	0.38
Human Development Index	0.81	0.08	0.30	0.10
Number of items	0.83	0.22	0.93	0.58
Sampling (schools, specific or general population)	0.09	0.09	0.02	0.08
Method of data collection (interview vs. questionnaire)	n.a.	0.09	n.a.	n.a.

Stratified by type of abuse and gender

Analyzing influences of moderator variables

Since the heterogeneity of prevalence rates between studies was considerably high, we explored contextual and methodological characteristics of the studies in meta-regression analyses (see Table 3). Inconsistent findings emerged regarding the effect of HDI in female CSA: a lower prevalence was found for countries with moderate HDI, but countries with high and low HDI showed the highest prevalence for CSA. HDI did not affect prevalence rates in males. In general, prevalence rates were higher in studies which used non-random samples (i.e. samples from schools or specific populations). Meta-regression results showed a trend for higher prevalence rates in school or specific samples ($p < 0.10$) than in the general population. Moreover, we found a trend showing higher prevalence rates of

forced intercourse in girls when data were collected by interview (vs. questionnaire) ($p = 0.09$). All other moderator effects were non-significant.

Discussion

Our review of 55 recent original investigations on CSA showed that CSA is highly prevalent worldwide. Females have a two or threefold risk compared to males to be sexually abused during childhood and about one in ten women is confronted with this experience. Similar gender-specific differences were reported in previous reviews for overall prevalence estimates (Andrews et al. 2004; Pereda et al. 2009b; Finkelhor 1994; Bolen and Scannapieco 1999). This difference in estimates of female and male

CSA might be due to methodological issues. It has been suggested that definitions of CSA do not capture the experiences of males adequately (Pereda et al. 2009b) or that some male-specific factors like fear being labeled as weak or being flagged as homosexual might underestimate prevalence in males (Goldman and Padayachi 2000). However, our results show quite a stable difference in prevalence according to gender, regardless of contextual characteristics and methods used.

Comparing our study with previous meta-analyses allows, therefore, drawing the preliminary conclusion that CSA is today not more common than in earlier days. We found that 9 % of women and 3 % of men have suffered forced intercourse, which is an important finding of this study. Moreover, 15 % of women and 8 % of men have suffered mixed sexual abuse. Our prevalence rates of mixed sexual abuse for females are somewhat lower than the 18 % found by Stoltenborgh et al. (2011) or the 19.7 % reported by Pereda et al. (2009b). However, differences have to be interpreted with caution because these other estimates are within CI interval from the current study. For males, the prevalence rate we report (8 %) is similar to the one reported in these two meta-analyses (7.6 and 7.9 %, respectively). This finding suggests that the assessment of CSA in children and adolescent give overall a good estimate of the most recent situation on this issue.

Especially regarding mixed sexual abuse, we found a large degree of heterogeneity ($I^2 = 99$ % and $I^2 = 98$ %). Previous authors reported similar findings on heterogeneity (Pereda et al. 2009b; Stoltenborgh et al. 2011). Reasons for these high values lie in the sample size of primary studies. The I^2 statistic increases with the number of patients included in a meta-analysis, independent of clinically relevant variation (Rucker et al. 2008). Another possibility to address heterogeneity is a visual exploration of the forest plots: the number of studies can be identified which differ largely from the pooled estimate. In our case, heterogeneity in forced intercourse prevalence is rather low, since only single studies represent outliers. However, in studies on mixed sexual abuse, the variation between studies is really large, which does not give precise pooled estimates.

Our findings suggest that it is important to differentiate between types of abuse to gain more adequate estimates. We found the highest prevalence estimates of CSA for non-contact abuse (17 %; upper CI >50 % for males and 31 %; upper CI >50 % for females) and mixed sexual abuse (8 %; CI 4–16 % for males and 15 %; CI 9–24 % for females). Slightly lower rates were reported for contact abuse (6 %; CI 2–16 % for males and 13 %; CI 8–21 % for females) and the lowest for forced intercourse

(3 %; CI 1–9 % for males and 9 %; CI 6–14 % for females).

Previous authors have argued that defining CSA in a broad sense (i.e. including non-contact, contact abuse and forced intercourse in one definition) leads to higher prevalence estimates as compared to using a narrow definition (i.e. only forced intercourse and contact abuse) (Andrews et al. 2004; Gorey and Leslie 1997). These authors attach great importance to a possible impact of the definition of CSA on the prevalence estimates. Previous studies also showed some higher rates for college or student samples (vs. national samples) (Goldman and Padayachi 2000), whereas others report the reverse effect (Rind et al. 1998). In the meta-analysis of Stoltenborgh et al., a higher prevalence in convenience samples was reported. Considering data collection, we show slightly higher prevalence estimates of forced sexual intercourse in females in studies using face-to-face interviews rather than questionnaires (a similar result was found for any type of CSA by Stoltenborgh et al. 2011), whereas previous studies do not show a clear effect of that factor (Goldman and Padayachi 2000; Leventhal 1998).

Strengths and limitations

One of the strengths of our systematic review is the use of very recent published work on CSA which resulted in 55 studies. Such a moderate number of studies did not allow examining CSA in specific age groups since nearly all studies were conducted with children at the age of 18. We were also not able to find any statistical differences on CSA between different regions, which might be due to limited power. Despite our efforts to translate studies published in non-english journals, which is a unique feature of our study, some regions remain underrepresented. Unpublished reports or conference presentations might be of interest for results from such regions. Another limitation of our study is the great heterogeneity between the included studies, even after controlling for moderator variables. Our findings on pooled prevalence estimates should, therefore, be interpreted with caution. Finally, previous authors have suggested a positive impact of number and type of screening questions asked on the prevalence estimates of CSA (Goldman and Padayachi 2000; Leventhal 1998; Bolen and Scannapieco 1999; Finkelhor 1994). We initially considered this as a target moderator variable. However, since in many studies the identification of mixed sexual abuse is done by asking a lot of rather unspecific questions [i.e. “have you ever been made by someone to do something sexual that you did not want to do?” (Decker et al. 2007)] it might be inappropriate to analyze this variable in

the meta-regression since the content of the questions is neglected.

Implications for further research

There is a need to regularly update systematic reviews on prevalence estimates of CSA worldwide. One reason is to identify whether CSA increases or decreases over the years. In order to obtain information about changes in prevalence estimates of CSA, future research can use our results as starting point of an actual prevalence estimate. In this way, a comparison can be drawn between future results and our findings. A second reason is the increase of data stemming from primary studies regarding CSA during the past two decades (Leventhal 1998; Goldman and Padayachi 2000; Briere 1992; Finkelhor et al. 2007).

In order to keep up with this flow of information and to reflect on the situation of CSA from a global perspective, there is a need for regular and systematic updates.

An important issue in conducting systematic reviews is the successful identification of relevant studies. We aimed to portray the current situation of CSA by including only studies conducted on children and adolescents. We found several publications (approximately 8 per year) that reported on the prevalence of CSA in this age group. However, for many of these studies, estimating the prevalence of CSA was not their primary outcome, which could make their identification difficult. Including such studies with a non-CSA focus might have the advantage of obtaining more and most current data, which exceed the number of included studies compared to earlier reviews. However, data on CSA related information data might not be adequately reported.

The large heterogeneity between studies is a major problem when conducting meta-analyses. This makes interpretation of the findings difficult. We recommend the development of guidelines in order to reach a consensus in the way CSA is defined and to make the studies more comparable regarding study quality. Loney et al. (1998) identified and discussed criteria that may be used by researchers, in order to critically evaluate research articles that estimate the prevalence of a health problem (Loney et al. 1998). Similar guidelines could be the first step to facilitate the identification of methodologically sound studies in CSA research as well.

Implications for practice

By investigating prevalence estimates of CSA throughout the world, we found comparatively homogeneous high

prevalence rates of forced intercourse in children. Based on these alarmingly high prevalence estimates, prevention efforts should be strengthened to timely identify persons at risk. Since we found substantial higher prevalence rates in more unspecific and maybe less obvious acts of sexual abuse in children (i.e. no contact abuse), such initial signs should be able to be communicated via helplines, school programs or other neutral pathways.

Regarding regional distribution and degree of development of the country, our findings did not show any statistical differences between studies concerning prevalence estimates of CSA. Therefore, preventive measures are needed in all countries, since CSA seems to be independent from geographical region. In order to provide the best possible support for the victims of CSA, guidelines for CSA treatment and management, such as those suggested by the World Health Organization for Africa (WHO 2004) should be developed for all regions. The implementation of such guidelines should be tailored to each country, in order to be as effective as possible, since the cultural context might built an obstacle in implementing successful interventions. This is especially the case for cultural differences in the possibility to disclose CSA to other persons, which is a prerequisite for interventions for victims.

To conclude, we found that about nine girls and three boys out of 100 are victims of forced intercourse. We show that the type of abuse explains a large part of the heterogeneity, but only the sampling method reduced heterogeneity in stratified analysis substantially. Including studies with children and adolescent participants is a feasible way to provide reliable information on the prevalence of this problem and this approach should be considered when implementing a surveillance system.

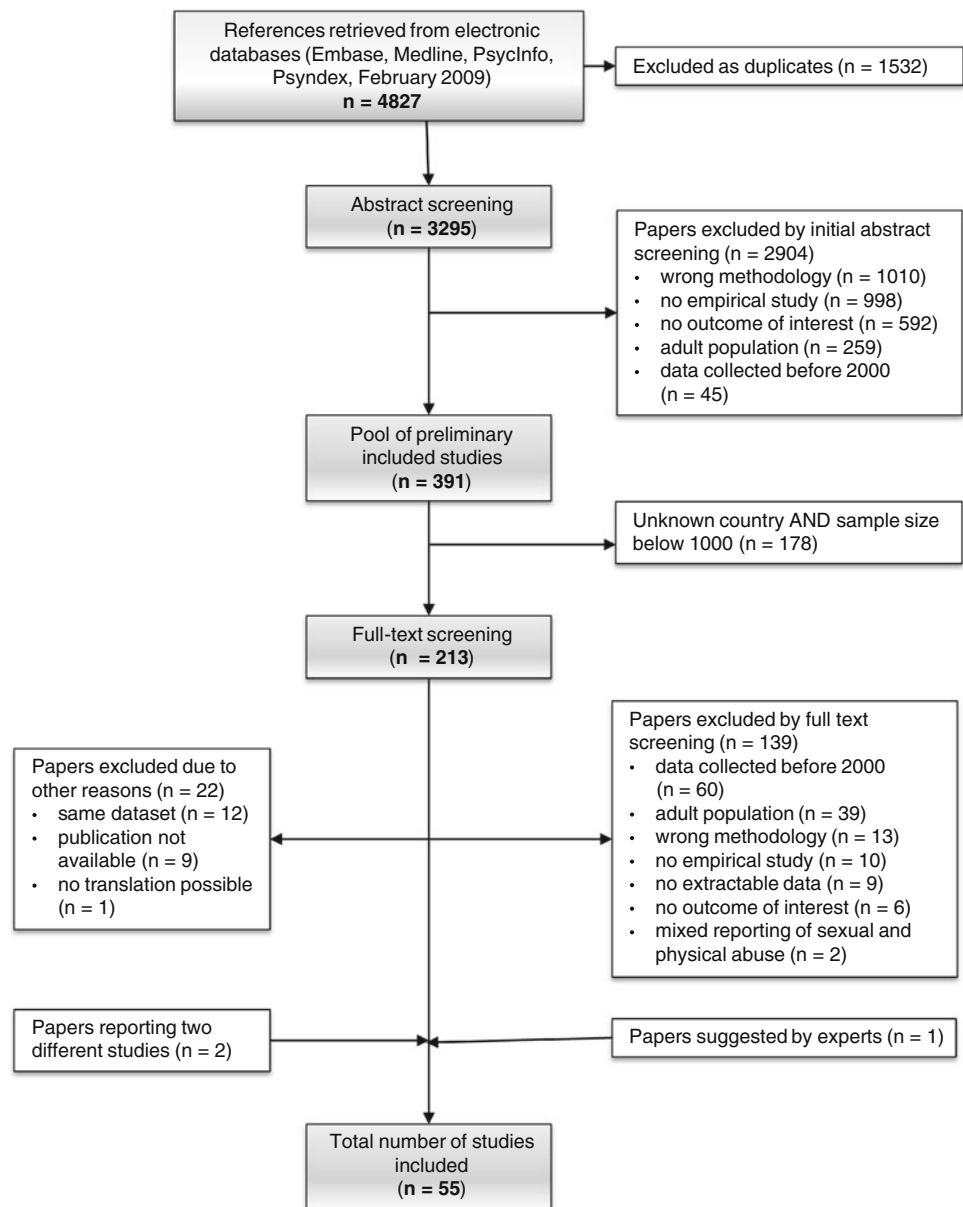
Acknowledgments We thank Bruno da Costa for translating the article written in Portuguese and Elisabeth Kiraly for the one in Hungarian. We are grateful to all the experts around the world who took the time to respond to our request for additional information on CSA in their geographical region. A list of the people contacted can be obtained from the corresponding author. We would also like to thank the International Society for the Prevention of Child Abuse and Neglect (ISPCAN) for providing the contact details of most of the experts. This study was initiated and funded by the UBS Optimus Foundation.

Conflict of interest None declared.

Appendix

See Fig. 3

Fig. 3 Flowchart of study selection



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