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Victimization, polyvictimization, and health in Swedish adolescents

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Abstract: The main objective of this article was to study the relationship between the different areas of victimization (eg, sexual victimization) and psychological symptoms, taking into account the full range of victimization domains. The final aim was to contribute further evidence regarding the bias that studies that focus on just one area of victimization may be introduced into our psychological knowledge. The sample included 5,960 second-year high school students in Sweden with a mean age of 17.3 years (range =16–20 years, standard deviation =0.652), of which 49.6% were females and 50.4% males. The Juvenile Victimization Questionnaire and the Trauma Symptom Checklist for Children were used to assess victimization and psychological problems separately. The results show that a majority of adolescents have been victimized, females reported more total events and more sexual victimization and childhood maltreatment, and males were more often victims of conventional crime. The majority of victimization domains as well as the sheer number of events (polyvictimization [PV]) proved to be harmful to adolescent health, affecting females more than males. PV explained part of the health effect and had an impact on its own and in relation to each domain. This suggests the possibility that PV to a large degree explains trauma symptoms. In order to understand the psychological effects of trauma, clinicians and researchers should take into account the whole range of possible types of victimization.

Keywords: victimization, childhood trauma, psychological symptoms, JVQ, TSCC

Introduction

Childhood victimization has for the last 20 years merited increased attention from media, researchers, and policymakers.[1–3] This has resulted in a series of international protocols, especially when it comes to child physical abuse, child sexual abuse,[4] and child exploitation, including trafficking.[5,6] The state and local child protective services reported incidence rates of 9.2% in the US during 2012.[7] The majority (78.3%) were victims of neglect, 18.3% were physically abused, 9.3% were sexually abused, and 8.5% were psychologically maltreated. The national estimate was that 1,640 children died of abuse and neglect, resulting in a rate of 2.2 deaths per 100,000 children.[7] Retrospective survey data, eg, from Sweden and the US, also reveal that a majority of the adult population has experienced some kind of childhood traumatization.[8] In the Adverse Childhood Experiences (ACE) study sample of health care consumers, 11.1% reported psychological abuse, 10.8% physical abuse, and 22% sexual abuse.[9]

Even in the young population, victimization is prevalent. Studies using extensive standardized questionnaires with representative samples of children in the US from birth to age 17 years show that a majority (60.6%) experienced a victimization in the

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last year, and victimizations were distributed among physical assault (46%), property offense (24.6%), childhood maltreatment (10.2%), and sexual victimization (6.1%).[10] Adolescents in Sweden at the age of 17 years reported a total lifetime (LT) victimization of 84.1%, distributed among the following domains: conventional crime victimization (66.4%), childhood maltreatment (24.0%), peer/sibling victimization (54.4%), sexual victimization (21.8%), and witnessing and indirect victimization (54.0%).[11] A somewhat older Swedish sample of young adults (20–24 years old) reported LT victimization of physical abuse (68.2% among males and 48.0% among females), verbal abuse (39.5% males versus 51.1% females), sexual abuse (7.5% males versus 33.3% females), neglect (8.6% males versus 13.1% females), witnessing violence (47.7% males versus 36.4% females), and property crimes (57.8% males versus 51.9% females).[12] Prevalence levels increased by the age of puberty for maltreatment and sexual victimization,[10] while physical bullying and sibling assaults declined in adolescence.[13,14]

Girls are overrepresented in sexual victimization and are more often subjected to psychological or emotional abuse.[11] Boys report somewhat higher levels of victimization by physical assault[10] and conventional crime.[11] Sex differences can generally be described by saying that boys are exposed to more physical victimization and girls are exposed to more relational victimization.[15]

Several health effects have been reported in relation to victimization. In their meta study, Hawker and Boulton[16] found associations between victimization and psychosocial maladjustment, including depression, loneliness, global low self-esteem, poor social self-concept, generalized anxiety, and social anxiety with effect sizes (Pearson's *r*) ranging from 0.25 to 0.45. Chan[17] reported that child victims were more likely to report posttraumatic stress disorder (PTSD), depressive symptoms, self-harm ideation, and poor physical or mental health. Takizawa et al[18] concluded that victimized individuals were at risk for a wide range of poor social, health, and economic outcomes nearly four decades after exposure. Victimized individuals are even overrepresented regarding psychological distress and are also frequent health care users.[19] Victimization increases the risk for psychiatric diagnoses[20] and appears to increase severity of psychiatric symptoms.[21] In more specific or diagnosis focused studies, victimization has been shown to be associated with social anxiety,[22–24] depression,[22] anger,[25] PTSD,[17,26] personality disorder,[27–29] deliberate self-harm,[30] and nonsuicidal self-injury.[31,32]

Victimization is associated with academic performance,[33] a lower grade-point average, and predicts later unemployment.[34] The neurobiological perspective and the advancement of in vivo neuroimaging have provided findings corroborating observations of behaviors and cognitive functioning as a result of trauma.[35] The brains of maltreated children with PTSD have been found to have smaller than normal cerebellar volume,[36] and the impact of maltreatment on the brain has been shown to worsen with duration and to vary depending on the age of onset, affecting the youngest the worst.[36] A lack of experience of stimuli in development, as seen in neglect, has been shown to result in delayed myelination of axons, with loss of executive function and self-regulatory behaviors.[37]

Although multiple findings support the conclusion that victimization is harmful, interpersonal events (one-on-one interactions) are found to have greater weight than noninterpersonal events regarding symptoms. This effect is larger among female adolescents than among males, indicating a developmental sex difference regarding vulnerability.[38] Further findings indicate that the most severe sexual abuse causes the greatest health issues, with penetrating child sexual abuse at the upper end of the scale of severity.[39]

Finkelhor et al[40] stress that the sheer number of events is a more potent factor than are single events concerning impact on health and that a simple victimization count can predict symptom variability to a greater extent than specific victimization types or categories. Further, those with the highest number of events, ie, polyvictims, bear a considerable burden of symptoms[41] and are also at greatest risk for revictimization.[42] In clinical samples, polyvictimization (PV) is shown to account for psychosocial impairment more than demographics and psychiatric diagnosis among inpatients as well as outpatients.[43]

In a group of victimized individuals, 10% of individuals with the highest levels of victimization have been defined as polyvictims, with different thresholds for different ages.[14] Adolescents 15–18 years old reported an average of 4.9 LT events, and for this group, PV corresponded to ≥15 LT victimizations (weighted value).[14] PV correlated strongly with trauma symptoms (0.46, $P<0.000$), and this was true both for older and younger children.[14] In the well-known ACE study, 24.9% reported one event, 12.5% two, 6.9% three, and 6.2% four out of seven event categories of adverse childhood events.[9] The authors found support for the theory of cumulative impact of childhood adversities when it was shown that increased exposure to multiple categories of victimization events increased the risk for various health risk behaviors as well as for both somatic and mental illnesses.[9]

The purpose of this article was to investigate the effects of LT victimizing events and polytraumatization on

psychological health, using standardized questionnaires and making an effort to control extraneous variables. This article is part of a larger ongoing project studying victimization and child health in relation to the contribution of genetic and psychosocial background to the risk for development of posttraumatic disorders and other clinical and subclinical conditions during adolescence.

Participants and methods

Participants

Sweden consists of 290 municipalities, which are classified into nine categories on the basis of structural parameters such as population, commuting patterns, and economic structure (SKL 1–9) developed by the Swedish Association of Local Authorities and Regions.[44] The goal of the sampling procedure was to obtain a representative sample (~5%) of students in the second year of upper secondary school system, evenly distributed among the nine SKL categories. All youths in Sweden who have completed compulsory school are entitled to a 3-year upper secondary school education. Students enter at age 16 years and may study until the age of 20 years. The upper secondary school offers three programs: 1) higher education preparatory programs (typically humanities, natural science, and social science); 2) vocational programs (typically health and social care, building and construction, and hotel and tourism); and 3) introductory programs (typically preparatory education, program-oriented individual options, vocational introduction, individual alternative, and language introduction, providing resources for students with different kinds of learning difficulties).[45]

Municipalities and schools were selected from registers of the Swedish National Agency for Education[46] in order to represent the national average concerning sex, birthplace, enrollment from various municipalities, and educational programs and to include a proportion of students in the introductory program. From a geographical perspective, the selection of municipalities and schools was made relative to convenience. If possible, all high schools in a municipality were chosen. One municipality category, "sparsely populated municipalities" (SKL 5), was omitted due to lack of high schools. All schools were public schools except for some private schools in the SKL 3 category.

A total of 53 schools were asked to participate in the survey. Two schools declined to participate. One reported that they had participated in other surveys and the other school did not present any reason. The 51 participating schools enrolled a total of 7,849 second-year students. A total of 6,096 students (78%) were present at the scheduled survey. The missing students were absent by plan or absent without notice (skipping class). Out of the 6,096 students present, 136 were not willing or able to complete the survey, resulting in an external attrition of 22% and an internal attrition of 2.2%. A tentative analysis suggests that the dropout group might have lower socioeconomic status and that victimization might be more prevalent in this group.

The sample of 5,960 second-year high school students, with a mean age of 17.3 years (range =16–20 years, standard deviation [SD] =0.652), represented 4.5% of all 17-year olds in Sweden.[47] The sample corresponds well with the national population distribution among municipality categories, with ±10% variation from the national average. The sample was merged from nine to three municipality categories, with 17.1% of the sample in large municipalities (>200,000 inhabitants), 47.9% in medium municipalities (50–200,000 inhabitants), and 35% in small municipalities (<50,000 inhabitants).

Of the sample, 50.4% were young males and 49.6% were young females. The majority of sociodemographic variables were in line with population measures. Two measures deviated: residing with both parents was more frequent, and parents had higher unemployment rates. The sociodemographic data concerning adolescent birthplace, parent's birthplace and employment, residence, and educational program were given in Table 1.

The students were grouped by educational program: for the theoretical program, n=2,648 (44.4%); for the vocational program, n=3,219 (54.0%); and for the introductory program, n=93 (1.6%; Table 1).

Procedure

A standardized information letter was sent to 51 schools following the initial contact and request to conduct the survey. The participating schools were asked to set up a suitable room for the survey, arrange a schedule, and appoint a teacher responsible for each class. School registers were updated with the help of the appointed teacher. Student attendance was noted in the register. All students were initially handed one page of written information about the project and contact information to use in the event that they felt any discomfort answering the questions that were asked. Prior to data

Table 1 Descriptive data of sample

Origin, adolescent	%	Community size	%	Educational program	%
Sweden	91.1	Large	17.1	Theoretical	44.4
Europe	4.1	Medium	47.9	Practical	54.0
Outside Europe	4.8	Small	35.0	Introductory	1.6

collection, the students received written information about this study and gave written informed consent for participation in the survey. According to the Ethical Review Act of Sweden,[48] active consent is not required from parents when adolescents are at the age of 15 years or older.

The survey was administered on personal computers provided by the school or the researcher, and the researcher was present for information and for answering any questions. None of the items could be omitted, limiting internal attrition on the item level. The students completed the survey in 30–40 minutes and were given movie vouchers.

Measures

The composite questionnaire consisted of introductory questions (location of survey, sex, birthplace, age, educational program, parents' birthplace, parents' employment, and residence) followed by five standardized questionnaires (the Child Self-Administered Questionnaire of the Juvenile Victimization Questionnaire [SAQ/JVQ], the Life Incidence of Traumatic Events, the Strengths and Difficulties Questionnaire, the Social Phobia Scales Questionnaire for Children, and the Trauma Symptom Checklist for Children [TSCC]). Certain questions regarding peritraumatic reactions were added to the JVQ. The four final questions concerned debut age and consumption level for alcohol, sexual debut age, contact with professionals (BRIS – Children's Rights in Society, school psychologist, school counselor, social worker, or child psychiatrist), and history of medication for mood disorder, hyperactivity, or trouble sleeping. Only the introductory questions of the SAQ/JVQ and TSCC are presented in this article.

Juvenile Victimization Questionnaire

The JVQ was designed to be a more comprehensive instrument than questionnaires used in previous research, providing an inventory of most of the major forms of offense against young people, including nonviolent victimization and events not typically conceptualized as crimes.[40] The JVQ obtains reports on 34 forms of offense against young people that cover five general domains of concern: conventional crime, childhood maltreatment, peer and sibling victimization, sexual victimization, and witnessing and indirect victimization. For the purpose of the current research, a modified version of SAQ was used. One survey item concerning sexual victimization that asked, "Did you do sexual things with anyone 18 years or older, even things you both wanted?" was excluded due to differences between the legal systems in the US and Sweden, resulting in a total of 33 JVQ items. The JVQ covers victimizing events during the prior year and before the prior year, which also make it possible to assess LT events. If victimization occurred in the prior year and/or before the prior year, the participant was instructed to answer follow-up questions regarding peritraumatic reactions and perpetrator characteristics, whether the event caused injury, and whether medical attention had been obtained.

The JVQ has been tested for construct validity using the TSCC[49] to measure trauma symptoms. The JVQ shows moderate but significant correlations with trauma symptoms for all the domains (Pearson's r=0.14–0.35) and for most screener items as well. The correlations are in the same range as those found in most assessments of community samples of victimized children.[50] The JVQ has been tested for reliability. Overall, concerning test–retest, there was an agreement of 95% (range 77%–100%) between 100 adolescents after 3–4 weeks, and the test–retest reliability was good (Pearson's r=0.59). Cohen's kappa for screener items ranged between κ=0.22 and κ=1.0 with a mean of κ=0.63.[50] Internal consistency reliability is reported for the full-scale JVQ as Cronbach's alpha =0.80. Cronbach's alpha varied among the five domains from 0.35 to 0.64.[50]

In this study, the internal consistency (Cronbach's alpha) was calculated for the full JVQ scale (α=0.83) and for conventional crime (α=0.66), childhood maltreatment (α=0.55), peer and sibling victimization (α=0.52), sexual victimization (α=0.64), and witnessing and indirect victimization (α=0.51). For the measure of PV, a simple count of endorsed screeners from the JVQ was used. Where "endorsed" denoted a "yes" response to a victimization screener question, the so-called Screener Sum Version was used.[40] PV was the label given to the most extreme 10% of the sample, corresponding to those who reported ten or more of the 34 types of victimization events (33 in our study) during an LT. The event items used in the model were included within five domains: conventional crime victimization (items 1–8), childhood maltreatment (items 9–12), peer and sibling victimization (items 13–18), sexual victimization (items 19–24, excluding the item statutory rape), and witnessing and indirect victimization (items 26–34).

Trauma Symptom Checklist for Children

The TSCC[49] is a self-report questionnaire about trauma-related symptoms. It consists of 54 items (scored 0–3), six main clinical subscales (anxiety, depression, anger, post-traumatic stress, dissociation, and sexual concerns), and two validity scales (hyperresponse and underresponse). The clinical scales are added up to give a total score. The Swedish translation of the questionnaire has displayed satisfactory

psychometric properties in Swedish adolescents.[51] The total score was used as the main measure of health.

Statistical analysis

The prevalence rates are reported as point prevalence. Differences in means were analyzed using an independent sample *t*-test. All the background items were dummy coded and entered in a simple regression analysis with TSCC as an outcome factor. The largest dummy-coded variable was used as a reference variable. If there were no significant negative effects of the different dummy-coded variables, the variable was dichotomized. When multiple regression models were analyzed for the background variables, the dichotomized background variables were entered first, followed by variables with more than two categories. The nonsignificant variables were excluded in the final model. Thereafter, a series of regression models were analyzed, separately for males and females and for the different victimization domains, with or without PV. If the regression coefficient for the domain remained largely unchanged after the PV measure was included, it indicated an independent effect for the domain. A total of ten separate regression analyses were performed. Since the aim was an exploratory examination of patterns in the data, no correction for multiple testing was performed. Multicollinearity was checked with variance inflation factor and tolerance.

All analyses were performed using SPSS Version 19.0 (IBM Corporation, Armonk, NY, USA).

Ethical standards

All human studies referred to in this article have been approved by the Regional Ethical Review Board in Linköping, which also approved this study (number: 69-07). All subjects gave their written informed consent prior to their inclusion in the study.

Results

Victimization according to JVQ/SAQ

A majority of the sample (84.1%) had experienced various victimizing events according to the JVQ/SAQ, and the mean number of different events was 4.1 (SD =4.0). Of the students, 64.4% ($\bar{x}$=1.5, SD =1.6) reported experience of conventional crime, 24.0% ($\bar{x}$=0.4, SD =0.7) childhood maltreatment, 54.4% ($\bar{x}$=1.0, SD =1.2) peer and sibling victimization, 21.8% ($\bar{x}$=0.4, SD =0.8) sexual victimization, and 54% ($\bar{x}$=1.0, SD =1.2) witnessing or indirect victimization. Young females had more experience of victimization in total (females $\bar{x}$=4.45, SD =4.22 and males $\bar{x}$=3.81, SD =3.84, P<0.001, d=0.158) and more experience in all domains, except for the domain of conventional crime, in which young males had experienced more victimization (males $\bar{x}$=1.64, SD =1.66 and females $\bar{x}$=1.39, SD =1.55, P<0.001, d=0.156; Table 2).

Trauma symptoms according to TSCC

Table 3 shows sex differences in the results from the TSCC, which were significant for all TSCC measures with young females having more symptoms for anxiety (females $\bar{x}$=5.95, SD =3.89 and males $\bar{x}$=3.06, SD =3.58, P<0.001, d=0.773), depression (females $\bar{x}$=5.77, SD =4.39 and males $\bar{x}$=2.95, SD =3.89, P<0.001, d=0.679), posttraumatic stress (females $\bar{x}$=4.74, SD =3.99 and males $\bar{x}$=4.24, SD =4.32, P<0.001, d=0.592), dissociation (females $\bar{x}$=6.91, SD =4.61 and males

Table 2 The proportion and mean number of events according to JVQ/ SAQ and sex

Variable	Male			Female			d^c
	%[a]	$\bar{x}$[b]	SD	%	$\bar{x}$	SD	
Total[d]	83.0	3.81	3.84	85.2*	4.45**	4.22	0.158
Conventional crime[d]	69.0**	1.64**	1.66	63.7	1.39	1.55	0.156
Child maltreatment	16.6	0.24	0.61	31.6**	0.48**	0.82	0.332
Peer/sibling victimization	51.5	0.93	1.19	57.4**	1.04**	1.17	0.093
Sexual victimization	10.6	0.15	0.53	33.2**	0.58**	1.02	0.529
Witnessing and indirect victimization	52.7	0.94	1.20	55.5*	0.97**	1.15	0.025

Notes: [a]Group differences were tested with the χ^2 test using dichotomized data. [b]Differences in mean were tested using the independent sample *t*-test. [c]Mean differences of Cohen effect size were 0.2 for small, 0.5 for medium, and 0.8 for large effect sizes. [d]5,332 participants due to technical error. *P<0.05 and **P<0.001.

Table 3 Mean TSCC score and sex

Variable	Male		Female		P	d^b
	$\bar{x}$[a]	SD	$\bar{x}$	SD		
Anxiety	3.06	3.58	5.95	3.89	*	0.773
Depression	2.95	3.89	5.77	4.39	*	0.679
Anger	4.24	4.32	4.74	3.99	*	0.120
Posttraumatic stress	4.88	4.69	7.80	5.16	*	0.529
Dissociation	4.83	4.43	6.91	4.61	*	0.460
Overt dissociation	3.34	3.25	4.77	3.45	*	0.426
Fantasy	1.49	1.54	2.14	1.62	*	0.411
Sexual concerns	5.92	4.76	4.46	3.72	*	0.341
Sexual preoccupation	5.47	4.21	3.51	3.13	*	0.528
Sexual distress	0.82	1.60	1.16	1.52	*	0.212
Total TSCC	24.90	20.73	34.10	20.28	*	0.449

Notes: [a]Differences in mean were tested using the independent sample *t*-test. [b]Mean differences of Cohen effect size were 0.2 for small, 0.5 for medium, and 0.8 for large effect sizes. *P<0.001.

Abbreviation: TSCC, Trauma Symptom Checklist for Children.

$\bar{x}$=4.83, SD =4.43, P<0.001, d=0.460), overt dissociation (females $\bar{x}$=4.77, SD =3.45 and males $\bar{x}$=3.34, SD =3.25, P<0.001, d=0.426), fantasy (females $\bar{x}$=4.77, SD =3.99 and males $\bar{x}$=1.49, SD =1.54, P<0.001, d=0.411), sexual distress (females $\bar{x}$=1.16, SD =1.52 and males $\bar{x}$=0.82, SD =1.60, P<0.001, d=0.212), and anger (females $\bar{x}$=4.74, SD =3.99 and males $\bar{x}$=4.24, SD =4.32, P<0.001, d=0.120). Young men reported more sexual preoccupation (males $\bar{x}$=5.47, SD =4.21 and females $\bar{x}$=3.51, SD =3.13, P<0.001, d=0.528) as well as sexual concerns (males $\bar{x}$=5.92, SD =4.76 and females $\bar{x}$=4.46, SD =3.72, P<0.001, d=0.341).

Victimization, PV, and trauma symptoms

Victimizing events correlated strongly (Pearson's r=0.410, P≤0.001) with trauma symptoms. Trauma symptoms measured with total TSCC increased with the number of events in a linear way (Figure 1). All TSCC measures increased with the number of traumatic events, most notably for posttraumatic stress and dissociation (Figure 2). When using the Lifetime Screener Sum Version (less than or equal to one event per question) with a cut-off ≥10 victimization events, 10.3% of the respondents (8.1% boys versus 12.5% girls, P<0.001) had the experience of being highly victimized (polyvictimized). Table 4 shows that both males and females in the polyvictimized group had significantly (P<0.001) more trauma symptoms within all TSCC subscales and in total than the nonpolyvictimized adolescents. The symptom level for the polyvictimized group reached or exceeded clinical levels as measured by the TSCC.[51]

Multiple regression analysis

All the background variables were added into simple regression models. A decision was made to dichotomize the variables "immigration status" (both parent and student), "SKL municipality division", "study program", and "family

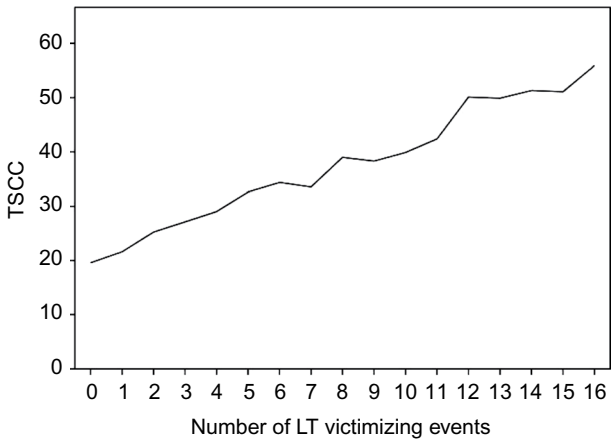

Figure 1 Number of victimizing events and TSCC total score.
Abbreviations: TSCC, Trauma Symptom Checklist for Children; LT, lifetime.

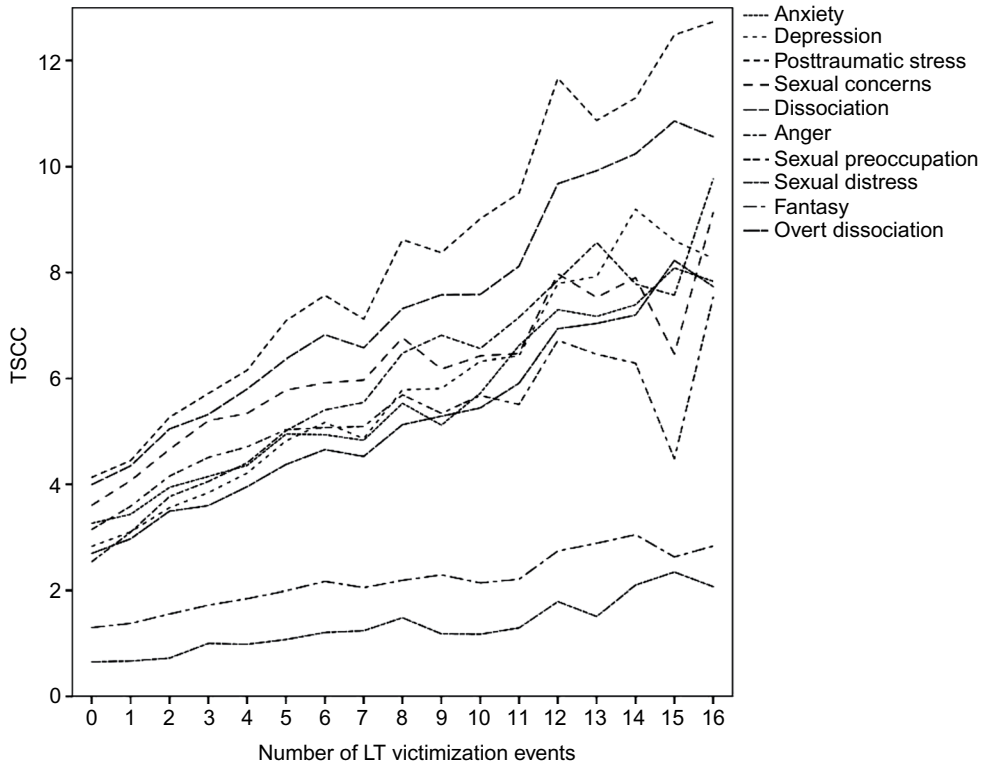

Figure 2 Number of events and TSCC score.
Abbreviations: TSCC, Trauma Symptom Checklist for Children; LT, lifetime.

Table 4 TSCC score for normal group and polyvictimized group

Variable	Male				Female			
	Normal group		Polyvictimized group		Normal group		Polyvictimized group	
	$\bar{x}^a$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Anxiety	2.88	3.48	4.96*	4.85	5.49	3.59	8.58*	4.69
Depression	2.75	3.78	5.30*	4.99	5.21	3.96	9.47*	5.66
Anger	3.88	4.11	7.91*	5.17	4.29	3.69	7.74*	4.94
Posttraumatic stress	4.48	4.48	8.74*	5.84	7.13	4.74	12.47*	5.81
Dissociation	4.50	4.29	7.84*	5.26	6.31	4.21	10.38*	5.61
Overt dissociation	3.09	3.15	5.63*	3.89	4.31	3.11	7.56*	4.23
Fantasy	1.41	1.50	2.21*	1.82	2.00	1.54	2.82*	1.88
Sexual concerns	5.65	4.67	8.37*	5.76	4.08	3.48	6.61*	4.47
Sexual preoccupation	5.22	4.13	7.59*	4.96	3.23	2.92	5.04*	3.83
Sexual distress	0.77	1.57	1.40*	2.18	1.04	1.45	1.91*	1.82
Total TSCC	23.24	20.08	41.39*	24.97	31.13	18.32	52.78*	24.16

Notes: [a]Differences in mean were tested using the independent sample *t*-test. *$P<0.001$.
Abbreviation: TSCC, Trauma Symptom Checklist for Children.

Table 5 Hierarchical regression analysis of health on traumatic events (step 1) and PV (step 2) of females (n=2,958) and males (n=3,002)

Variable	Model	Male			Female		
		Item β	PV β	Adjusted R^2	Item β	PV β	Adjusted R^2
	Only PV		0.233	0.063		0.340	0.133
Conventional crime	Without PV	0.210		0.053	0.251		0.081
	With PV	0.172	0.200	0.091	0.171	0.294	0.159
Child maltreatment	Without PV	0.260		0.075	0.322		0.118
	With PV	0.187	0.158	0.092	0.219	0.246	0.172
Peer sibling victimization	Without PV	0.226		0.059	0.274		0.091
	With PV	0.160	0.187	0.086	0.195	0.281	0.167
Sexual victimization	Without PV	0.221		0.057	0.342		0.132
	With PV	0.157	0.181	0.084	0.254	0.239	0.186
Witness victimization	Without PV	0.103		0.018	0.189		0.052
	With PV	0.038	0.223	0.064	0.099	0.310	0.141

Notes: Hierarchical multiple regression analyses were conducted considering the adolescents' answers irrespective of the number of domains they had endorsed. The numbers are standardized coefficients. All values are significant to $P<0.001$. The criteria include sum of TSCC, controlling for origin, community size, and educational program.
Abbreviations: PV, polyvictimization; TSCC, Trauma Symptom Checklist for Children.

occupation" due to the nonsignificant effect of some of the "dummy groups". Immigration variables were grouped into immigration status, "born in Sweden and Europe or born outside Europe"; SKL municipality division, "living in large or medium municipalities or living in small municipalities"; and study program "practical and theoretical program or individual program". The variable "family occupation" was originally dichotomized, and the variable "student's living situation" was kept within three groups (two dummy variables): "living with parent", "living in an institution" and "living alone".

A multiple regression analysis was carried out with the background variables. The results showed that only the variables "SKL living in small municipalities", "family occupation", and "living alone" were significant and were kept for further analysis. The model could account for 1.4% of the variance (adjusted R^2=0.014) and did not show any multicollinearity.

In order to test the influence of type of victimization on symptoms as well as the contribution of PV, a series of regression analyses were performed with psychological symptoms (total continuous scale of TSCC total) as the dependent variable. In the first step, the domain variable (categorical 1/0) was entered, and in the second step, the PV variable (categorical 1/0) was entered. This was repeated for each item. A summary of the results of regression analyses is listed in Table 5. All domains significantly predicted symptoms; PV alone was strongly related to symptoms for females (β=0.340). PV also affected symptoms for men, although not as strongly (β=0.233) as that for females. For males, the strongest predictor was child maltreatment (β=0.260), followed by peer sibling victimization (β=0.226). For all the domains, β value was diminished when PV was entered into the model and the adjusted R^2 increased, most strongly for the domain of conventional crime. For females, childhood maltreatment and sexual victimization both presented a strong relationship

to symptoms (β=0.322 and β=0.342, respectively). For all the domains, the contribution of PV reduced the association with the different victimization domains, lowering the β value, indicating that symptoms are to a large degree dependent on the co-occurrence of other traumas. Witnessing victimization displayed the lowest item value (β=0.189) and was markedly reduced (β=0.099) when PV was introduced into the model. The adjusted R^2 increased for every model when PV was entered, more so for females than for men.

Discussion

This study investigated the relationship between the experiences of LT victimizing events and the psychological health among young people in Sweden. This study also explored the effect polytraumatization could have on psychological health. The results may be summarized into three main findings.

First, this study confirms that victimization among young people is common: a majority of the adolescents reported at least one event, as found by others.[38,41,52,53] The mean number of experienced events was four ($\bar{x}$=4.12, SD =4.043). This is in line with the earlier studies,[14,38,52] higher than the UK studies,[53] and lower than the findings of Soler et al.[54]

Females were overrepresented in all domains except conventional crime compared to males, as found by Finkelhor et al.[13] Sexual victimization was roughly three times as common and child maltreatment roughly twice as common among females than males. Females also had more events in all domains except conventional crime where men had more events as reported by Cyr et al.[55] Our data revealed very large differences in the number of events where females had twice as many child maltreatment events and approximately four times as many sexual victimizations events than males, a finding also described by Jackson et al.[53]

Second, we found that symptoms of psychological ill health, as measured by the TSCC, were clearly associated with both victimization per se and the number of victimizations. The results show a relatively linear increase in symptoms with the increased number of events experienced, similar to the findings of others,[12,41] especially for posttraumatic stress and dissociation, which was also reported as a main finding by Nilsson et al,[56] in which the authors discussed the link to interpersonal events. As expected, the bivariate analysis showed that the mental health of the polyvictimized group was significantly worse than that of the nonpolyvictimized group, with significantly elevated TSCC scores.

Third, in the inferential multivariate analyses controlling for extraneous variables, all JVQ domains were related to symptoms, and PV had an impact on symptoms in the model in itself and in relation to each domain. When PV was introduced into the model, all the domains' β values dropped, more in females than males. For males, the β value of the domain "childhood maltreatment" was higher than the β value of PV, suggesting that childhood maltreatment contributed more than PV alone, and for females, "sexual victimization" showed the same relationship. Witnessing victimization had a low β value initially, and with PV introduced into the model, it dropped clearly below PV β alone, suggesting that witnessing victimization in this model had little impact on health and that PV to a large degree accounted for the symptom levels in witnessing victimization.

Our findings are in line with those of Finkelhor et al[57] in that the sheer number of different events is of importance when measuring victimization. Our results, however, do not support the conclusion by Finkelhor et al[57] that PV is of chief importance in relation to the domains in the study; our study did not find the same β value reduction as theirs did when PV was introduced. This could probably be explained in part by methodological differences, such as differences in information gathering techniques (telephone survey versus the classroom computerized survey used in this study), differences in sample size (the sample used in this study is approximately five times larger), and differences in the age groups studied (this study included only adolescents aged 17 years compared to their subsample of 10–17-year olds). Further research is needed in order to identify why PV had a lower impact in our model.

Strengths and limitations

The need for well-designed research in this field has been pointed out by others,[58–60] who identified key methodological issues in abuse research such as definitions of maltreatment, source of study populations, source of comparison group, and subject recruitment. We have designed this study according to their recommendations. The strength of this study was the use of clearly defined questions covering a broad range of victimizations and psychiatric symptoms, a large sample generalizable to the population, and a standardized recruitment process. No cause and effect relationship can be inferred due to the cross-sectional design. Because victimization is not a randomly assigned condition, it is not possible to state that the symptoms are caused only by the victimization. We used LT data, which have an increased potential for attribution error and put a strain on memory recall, leading to the possibility of biased results. Owing to our data collection method, we could not use the separate incident version of the JVQ, with the effect that all victimizations counted equally

regardless of whether they originated from the same incident or not, with the obvious result of a higher number of reported victimization events.

Conclusion

The results show that a majority of adolescents in Sweden have been victimized as measured by the JVQ. The results differ by sex: young females experiencing ~4.5 total events and more events for all domains, with sexual victimization and childhood maltreatment more prevalent, and young males report approximately four events, with conventional crime victimization more prevalent.

The results also show a linear pattern for the number of victimizing events, with posttraumatic stress and dissociation markedly having the greatest effect on health.

The results show that the majority of victimization domains as well as the sheer number of events (PV) proved to be associated with adolescent health, affecting females more than males. PV explained part of the health effect and had an impact on its own. This suggests the possibility that PV to a large degree explains trauma symptoms.

These findings, if confirmed in other studies, raise questions on the previous literature concerning the impact of victimization. It is possible that studies and meta-analyses concerned with single forms of victimization, like sexual abuse or exposure to community violence, may have overestimated the unique association between these single forms and various symptoms because they did not adequately control for other kinds of victimization.

Determining the effect of victimization on health is complex, because events are interrelated and health is affected by individual as well as environmental factors. Measuring only one or a few forms of victimizations can lead to an attribution error, since the observed effect could be accounted for by an unmeasured victimization. Applying a comprehensive questionnaire covering most events improves the ability to correctly assess the contribution of independent variables to an outcome, thus improving the instrument's sensitivity and specificity. Researchers and clinicians need to cover a broader range of victimizations and question conclusions of studies and assessments organized around a single form of victimization.

The health impact of witnessing and indirect victimization was found to be minor. Instead, symptoms were explained to a large degree by PV. Finally, this analysis is based on victimization categories, and including specific events could add information to our results; however, this is not within the scope of this article.

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Disclosure

The authors report no conflicts of interest in this work.

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