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Public Health

Childhood Abuse, Household Dysfunction and the Risk of Attempting Suicide in a National Sample of Secondary School and University Students

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Key words: childhood abuse; household dysfunction risk factors; suicide attempt; suicide prevention; Republic of Macedonia.

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Abstract

OBJECTIVES: One of the main objectives of this paper is to analyze the associations between childhood abuse, household dysfunction and the risk of attempting suicide among young adolescents in the country.

METHOD: A representative sample consisted of total 1277 students (58.6% female and 41.6% male), aged 18 and above in year four of 664 secondary school and 613 first- and second-year university students. The data were obtained using Adverse Childhood Experiences Study Questionnaires (Family Health History Questionnaire) for collecting information on child maltreatment, household dysfunction and other socio-behavioural factors, applying WHO/CDC-recommended methodology. Statistical significance was set up at $p<0.05$.

RESULTS: Emotional neglect, physical abuse and physical neglect were the most frequent abusive experiences students had. Overall, suicide attempts were reported by 3.1 % of respondents (4.7% by females and 0.8% by males). Those respondents who had been emotionally abused were almost three times as likely to attempt suicide, physical abuse almost doubles the chances of attempting suicide, substance abuse in the family increased the chances 2.3 times for attempting suicide, violent treatment of the mother almost quadrupled them for attempted suicide, having a family member who had been in prison increased the odds of almost 3.5 times for attempting suicide. Attempted suicide was found to be 1.5 times more likely as the number of ACEs reached 3 and 3.4 times more likely as the number of adverse childhood experiences reached four or more.

CONCLUSION: Identifying and treating children, adolescents and young adults who have been affected by adverse childhood experiences may have substantial value in our evolving efforts to prevent suicide.

Introduction

Each year, about 4 million adolescents worldwide attempt suicide [1]. The immediacy of the developmental stress, potential abuse and household dysfunction are common risk factors. These experiences are not easily elaborated by adolescents which at certain points may make appear the suicide to be the only solution.

An expanding body of research suggest that childhood trauma and adverse life experiences can lead to negative health outcomes, including substance abuse, depressive disorder, and attempted suicide among adolescents and adults [1, 2]. Childhood sexual and physical abuse has been associated with suicide attempts [3-6]. In the last decades growing body of evidence suggests the relationship between multiple childhood trauma and the risk for suicide attempt, such as abuse, witnessing domestic violence, and other forms of household dysfunction which are highly interrelated [7] and have a graded relationship to numerous health and social problems [7, 8].

The data used in this article is an integral part of the data collected for more comprehensive project

"Survey of adverse childhood experiences (ACE) among young people". The study has been conducted 2010. Implementation of the study was enabled with technical and financial support by the World Health Organization in collaboration with the University Clinic of Psychiatry, Medical Faculty in Skopje.

We examined the relationship of 10 adverse childhood experiences (childhood abuse [emotional, physical and sexual] witnessing domestic violence, parental separation or divorce, and living with substance abusive, mentally ill or criminal household members) to the adolescent risk of suicide attempts in a sample of students in Republic of Macedonia. We also examined the relationship between the number of adverse childhood experiences (ACEs) and suicide attempts during childhood and adolescence.

Methods

The Adverse childhood experience study among students in secondary schools and universities in the Republic of Macedonia is collaboration between WHO Department of Violence and Injury Prevention through the WHO Country office in Skopje and University Clinic of Psychiatry, Medical Faculty, Skopje. The overall objective was to assess the impact of numerous ACEs on a variety of health behaviours and outcomes among adolescent population age 18-21. The ACE study was approved by the Ministry of Education and Science of the Republic of Macedonia and its review boards. Potential participants were given Informed Consents forms that accompanied the ACE study questionnaire and told them that their participation was voluntary, and that their answers were confidential.

Numerous articles and publications from ACE study have shown a strong graded relationship between the number of ACEs, multiple risk factors for leading causes of death in the US [7] and priority health and social problems such as smoking, sexually transmitted diseases, unwanted pregnancies, and alcohol problems [7, 8].

The instrument – ACE Questionnaires

The questionnaires that we used in the study were developed by the US Centers for Disease Control and Prevention and Kaiser Permanente in 1997, and include the *Family Health History* and *Physical Health Appraisal* questionnaires for collecting information on childhood maltreatment, household dysfunction and other socio-behavioural factors [9]. The questionnaires were translated into Macedonian and Albanian and a cognitive testing was done according to the usual procedure. A pilot study was performed on a sample of 60 students (28 females and 22 males) from the secondary school of medicine in Skopje and further corrections of the translation and language was made, taking into consideration the comprehension of the questionnaire for our target group/s and its cultural acceptability.

All the respondents completed a standardised questionnaire - Family Health History (a male and female version), without applying Physical Health Appraisal questionnaire, because the target population were adolescents and young adults, which usually are a healthy population group in terms of physical health. The questionnaire consists of 68 questions examining various types of child maltreatment, childhood adversities rooted in household dysfunctions, and other risk factors. All the questions are introduced with the phrase "While you were growing up, during your first 18 years of life,..." Students' questionnaires were filled out anonymously. Survey procedures were designed to protect student privacy by allowing voluntary and anonymous participation and possibility to withdraw their participation at any time of the research.

Definitions of adverse childhood experiences

Among adverse childhood experiences US Centers for Disease Control and Prevention defined: experiences of emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect, and experiences of household dysfunction such as: living with a family member who is mentally ill, alcoholic or illicit drug user, incarcerated or criminal, and experiences of domestic violence.

Emotional abuse was determined from answers to 2 questions: "Often or very often parent or other adult in the household swore at, insulted or put you down" and "Often or very often a parent or other adult in the household acted in a way that made you afraid that you would be physically hurt. Emotional neglect was determined from answers to 3 questions: "Never felt loved", "Rarely, sometimes, often or very often thought parents wished you had never been born" and, "Rarely, sometimes, often or very often you felt that someone in your family hated you". Physical abuse was described by 2 questions: "Often or very often a parent or other adult in the household pushed, grabbed or slapped you" and "Sometimes, often or very often a parent or other adult in the household hit you so hard that you had marks or were injured." Sexual abuse was described by 4 questions: "During the first 18 years of life did an adult or older relative, family friend or stranger at least 5 years older (1) touch or fondle your body in a sexual way, (2) made you touch their body in a sexual way, (3) attempt to have any type of sexual intercourse with you, (4) Actually have any type of sexual intercourse with you?" A "Yes" response to any of these 4 questions was considered as sexual abuse. Physical neglect was determined from answers to 3 questions: "Rarely, sometimes, often or very often you had to wear dirty clothes" "there was never someone to take you to a

doctor if you needed it", "Sometimes, often or very often you didn't have enough to eat, even when there was enough food?" Household dysfunction was described by substance abuse by a family member, asked by two questions weather respondents during their childhood lived with a problem drinker or alcoholic, or with anyone who used street drugs; by a family member suffering from mental illness, asked by two questions if they lived with someone depressed or mentally ill, or with someone who had attempted suicide; if a family member has a criminal behaviour, asked by 2 questions if a household member ever went to prison or committed a serious crime; by experiencing parental separation or divorce. All these experiences were defined as a "yes" response to the questions. Childhood exposure to domestic violence was described by 4 questions addressing violent treatment of mother: "Sometimes, often or very often your mother/step mother was pushed, grabbed or slapped, or have things thrown at her", or "kicked, beaten, hit with a fist, or with a hard object", "repeatedly hit her for a period of at list few minutes", and "threatened her with, or hurt by a knife or gun".

ACE study design

The ACE study used a random selection of a representative sample of students in IV year secondary school (aged 18 and above) and first and second year university students.

The sampling framework included all secondary schools containing IV year (33 schools). Eleven schools were selected by random selection to participate in the ACE study. The sample consisted of randomly selected intact classrooms (using a random start) from each school. All students attending school on the day of the testing in the sampled classrooms were eligible to participate in the ACE. University students attending I and II year in the four state university centers (in Skopje, Bitola, Tetovo, and Shtip), from 9 faculties attending lectures on the day of testing were approached and had been offered to take part in the study. Students came from 4 different geographical areas and from several different ethnic groups in the country (Macedonian, Albanian, Turkish and other ethnic groups)

Results

Characteristics of the study population

The sample consisted of 664 secondary school students (258 males and 406 females) which represented 2.8% of total student population in fourth grade from general and vocational school, thus obtaining stratified sampling considering different social strata. The university student sample consisted of 613 (343 female and 270 male) students from these four universities, which is 1.9% of the total student population in the first and second year of studies [10].

The student response rate was 90.3 % (1277 of 1414 students included in the sample). In the 11 secondary school all girls and boys attending selected classrooms, present that day at school were invited to participate in the study. The total number of non-responders in this group was 102 (13.3%). The total number of non-responders in the university group was 35 (5.4%) consisting of 30 male students and 5 female students.

Table 1: Age and sex of respondents (N = 1277).

Sex	N	%	Mean age	St. dev
Female	749	58.6	19.83	2.44
Male	528	41.4	20.14	2.77
Total	1277	100	19.95	2.73

Table 2: Prevalence of each Category of Adverse Childhood Experience and ACE score by sex.

Adverse childhood experiences (ACE)	N (%) Female (N=749)	N (%) Male (N=528)	N (%) Total (N=1277)
Emotional abuse	88 (11.7%)	51 (9.6%)	139 (10.8%)
Physical abuse	151 (20.2%)	118 (22.3%)	269 (21.1%)
Sexual abuse	55 (7.3%)	110 (20.8%)**	165 (12.9%)
Emotional neglect	266 (35.5%)	125 (23.7%)**	391 (30.6%)
Physical neglect	116 (15.5%)	139 (26.3%)**	255 (20.0%)
Substance abuse by f.m.	90 (12.0%)	81 (15.3%)	171 (13.4%)
Mental illness by f.m.	31 (5.9%)	57 (7.6%)	88 (6.9%)
Domestic violence	81 (10.8%)	48 (9.0%)	129 (10.1%)
Incarcerated f.m.	34 (4.5%)	30 (5.7%)	64 (5.0%)
Parental separation	33 (4.4%)	16 (3.0%)	49 (3.8%)
ACE Score (Number of ACEs)	Female	Male	Total
0	286 (38.2%)	173 (32.8%)	459 (35.9%)
1	213 (28.4%)	161 (30.5%)	374 (29.3%)
2	108 (14.4%)	90 (17%)	198 (15.5%)
3	76 (10.1%)	49 (9.4%)	125 (9.8%)
4 and more	66 (8.8%)	55 (10.4%)	121 (9.5%)

**p < 0.05.

The prevalence of each experience and the ACE scores are given in the Table 2. Emotional neglect, physical abuse and physical neglect were the most frequent abusive experiences students had. There was a statistically significant difference between female and male respondents in experiencing sexual abuse, physical neglect (significantly more males) and emotional neglect (significantly more female respondents) (Table 2). Almost 30 % of the respondents reported at least one adverse experience of the 10 categories, 15.5% reported two adverse experiences, 9.8% three such experiences and 9.5% four and more such experiences.

Table 3: Characteristics of suicide attempts by adolescents by sex.

Suicide attempt by adolescents	Female N (%)	Male N (%)	Total N (%)
Suicide attempt	35 (4.7)	4 (0.8)	39 (3.1)
Mean age of the attempt	13.83	14.24	14.09
Suicide attempt resulting in injury	9 (1.2)	2 (0.4)	11 (0.9)
2 or more suicide attempts	11 (1.5)	3 (0.6)	14 (1.2)

N = 39.

Overall, suicide attempts were reported by 3.1 % of respondents. There was a statistically significant difference between female and male respondents (for $p<0.05$), with 4.7% for females and 0.8% for males. The age when suicide was first attempted for both sexes was 14. In 1.2% of females and 0.4% of males the attempt(s) resulted in injury, which indicates that the attempt was very serious. More than one attempt was made by 1.5% of females and 0.6% of males.

To assess the ACE as risk factors for suicide

attempts during childhood and adolescence we examined the association between the type of ACE and suicide attempts.

There were statistically significant associations between attempted suicide and all types of abuse for both sexes. For female students there were statistically significant associations between attempted suicide and being physically abused so that one had marks or was injured (Pearson chi-square: 99.9, p<0.01), suicide attempt and emotional abuse (Pearson Chi-square 72.99, p<0.01), between attempted suicide and being physically abused by kicking, grabbing or pushing (Pearson chi-square 12.9 p<0.05), and between attempted suicide and sexual abuse (Pearson chi-square 6.96, p<0.01). For male students there were significant associations between attempted suicide and physical abuse with marks or injury (Pearson chi-square 130.1, p<0.01) and between attempted suicide and physical abuse by being kicked grabbed, pushed (Pearson chi-square 27.9562, p<0.01).

There ware significant associations between attempted suicide and household dysfunction, primarily living with a family member who had attempted suicide (Pearson chi-square 28.1, p<0.01), living with a family member who was mentally ill (Pearson chi-square 23.4, p<0.01) and having an alcoholic family member (Pearson chi-square 17.3, p<0.01) for female respondents only.

Table 4: Adjusted relative odds of suicide attempt by type of adverse childhood exposure.

Adverse childhood experiences	Suicide attempt
Emotional abuse	2.354 (1.082-5.119)**
Physical abuse	1.760 (0.872-3.549)
Sexual abuse	2.0 (0.801-4.995)
Emotional neglect	1.064 (0.543-2.084)
Physical neglect	0.717 (0.274-1.871)
Substance abuse by f.m.	2.229 (1.026-4.845)**
Mental illness by f.m.	1.979 (0.734-5.269)
Domestic violence	4.082 (1.981-8.411)*
Incarcerated f.m.	3.449 (1.268-9.382)**
Parental separation	0.594 (0.0791-4.454)

Odds ratios adjusted for age, sex, SES; **p<0.05; *p<0.01.

The relationship between adverse childhood experiences such as all types of abuse during childhood and household dysfunction and later manifestation of health risk behaviours among young people such as suicide attempt, as well as adjusted relative odds of suicide attempt by type of adverse childhood exposure are shown on Table 4**.** If a respondent was exposed to one adverse childhood experience, the probability of exposure to any category of health-risk behaviour increased substantially. Those respondents who had been emotionally abused were almost three times as likely to attempt suicide (statistically significant). Physical abuse almost doubled the chances of attempting suicide. Moreover, substance abuse in the family increased the chances 2.3 times for attempting suicide (statistically significant). Violent treatment of the mother, i.e. domestic violence, almost quadrupled them for attempted suicide, (statistically significant). Having a family member who had been in prison increased the odds of almost 3.5 times for attempting suicide (statistically significant). Overall, these results showed that being exposed to negative experiences during childhood could result in a number of risky behaviours in adolescence and young adulthood.

Table 5: Prevalence and odds of suicide attempt by number of adverse childhood exposures.

Suicide attempt	Number of adverse childhood experiences				
	0 (N=457)	1 (N=374)	2 (N=198)	3 (N=125)	≥4 (N=121)
Prevalence	2.2	2.4	3.0	4.0	7.4
OR (95% CI)	0	0.736 (0.344-1.576)	1.019 (0.418-2.484)	1.533 (1.207-3.516)*	3.347 (1.525-7.346)**

OR, Odds Ratio; CI, confidence interval. Among 749 women; Adjusted for age, sex and SES; *p<0.5, **p<0.05.

The general trend indicated that there was a relatively strong graded relationship between health-risk behaviours and number of adverse childhood experiences.

Significantly attempted suicide was found to be 1.5 times more likely (OR=1.533, 95% CI = 1.207-3.516) as the number of ACEs reaches 3 and 3.4 times (OR = 3.447, 95% CI = 1.525–7.346) more likely as the number of adverse childhood experiences reached four or more.

Discussion

Our study confirmed the finding, that females significantly more often attempt suicide, significantly more often had more than one attempt, and the attempt(s) more often resulted in injury, which indicated that the attempt was very serious. During adolescence, girls who are under stress are more likely to suffer from emotional and psychosomatic problems, following the pattern of internalizing psychopathological manifestations (such as anxiety, depression, and somatisation) which at some point might lead to suicidal behaviour. Boys under stress have more behavioural and conduct problems, following the pattern of externalization [11, 12]. The immediacy of the developmental stress and potential abuse and household dysfunction are experiences not easily elaborated by children and adolescents, as a result of which at certain points suicide may appear to be the only solution.

We found that 8 out of 10 adverse childhood experiences increased the risk of attempting suicide during adolescence from 1.5-4 folds. The impact of pain and anxiety caused by emotional, sexual and physical abuse or witnessing domestic violence are experienced in silence and sometimes suicide attempt is perceived as the only way out or an appeal for help. Because the experiences are strongly interrelated and rarely occur in isolation [4], it is important to simultaneously consider the impact of multiple experiences. As the number of these experiences increased, the risk of ever attempting suicide, as well

as risk of attempting suicide either during childhood/adolescence or adulthood increased dramatically [1]. A strong graded relationship was reported between the number of adverse experiences in childhood (multiple forms of CAN and household dysfunction) and self-reports of health-risk behaviours during adolescence (such as attempted suicide among others) [7]. These findings are supported by studies on abused children and adolescents at high risk of suicidal behaviours [5].

Information from neurosciences supports the biological plausibility of our findings. Children who experience traumatic events are more likely to have problems with emotional and behavioural self regulation later in life, and are more likely to mutilate themselves and attempt to commit or commit suicide [13]. Furthermore, the biological processes that occur when children are exposed to adverse events such as recurrent abuse and witnessing domestic violence can disrupt the early development of the central nervous system, which may additionally affect brain functioning later in life [14-18].

The results of this study are subject to certain limitations. Responses were based on self-reports. A potential weakness of studies of this kind might result in the likelihood of giving socially desirable answers. It is also known that studies with retrospective reporting of childhood experiences have the possibility of recalling bias, such as the likelihood that more recent and severe experiences are being reported. It may also be possible that there was differential recall, depending upon the nature and significance of the events (e.g., sexual abuse compared with emotional neglect, suicide attempt compared to smoking).

We did not examine the relationship between suicide attempts and other health risk behaviours in adolescence such as alcohol abuse and drug use, which can also increase the suicidal risk.

In conclusion we found that adverse childhood experiences increase the risk of attempting suicide. Thus, recognition that adverse childhood experiences are common and frequently happen as multiple events may be the first step in preventing their occurrence. Identifying and treating children, adolescents and young adults who have been affected by such experiences may have substantial value in our evolving efforts to prevent suicide.

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