

SURVEY OF ADVERSE CHILDHOOD EXPERIENCES AND ASSOCIATED HEALTH-HARMING BEHAVIOURS AMONG POLISH STUDENTS



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ABSTRACT

A cross-sectional survey was undertaken to estimate the prevalence of child maltreatment and other adverse childhood experiences, and their association with health-harming behaviours in Poland. The survey was conducted among 1760 randomly selected students from five purposefully selected Polish universities. Participants filled in the adverse childhood experiences survey instrument. The results showed that the prevalence of child maltreatment and other adverse childhood experiences was high: physical abuse was reported by 46%, emotional abuse by 42%, sexual abuse by 5% and emotional neglect by 25%. Household dysfunction was also high, with household street drug use reported by 3%, alcohol misuse by 21%, mental disorder by 19%, parental violence by 8% and household crime by 5%. Twenty-four per cent had not had any adverse childhood experience, while 19% reported that they had undergone four or more types of adverse childhood experiences. There was a significant association between adverse childhood experiences and health-harming behaviours such as suicide attempt, alcohol misuse, drug use, risky sexual behaviour and tobacco use. The findings suggest that there is a need to invest in prevention programming.

Keywords

Adult Survivors of Child Abuse
Self-Injurious Behavior
Child Abuse - prevention and control
Violence - prevention and control
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PREFACE

Our study, entitled “Relationship between adverse childhood experiences and behavioural and lifestyle factors among Polish students”, was carried out under a collaborative agreement between the Polish Ministry of Health and WHO Regional Office for Europe.

The study targeted young adults whose early childhood coincided with the first years of the 21st century, when the new law counteracting domestic violence was adopted in Poland. Since that time, violence prevention measures have become a part of teaching curricula, including post-diploma studies, of various professional groups, including medical professionals.

The National Health Plan 2016–2020 provides for a range of measures to improve population health. The strategic objectives of the National Health Plan include:

- preventing and addressing problems arising in connection with the use of psychoactive substances, behavioural addictions and other risk behaviours;
- preventing mental health problems and improving mental well-being in society.

We hope that the outcomes of this study will not only help to better understand the relationship between adverse childhood experiences (ACEs) and engaging in health-risk behaviours and development of noncommunicable diseases among young adults, but will also help improve the effectiveness of public health interventions.

Ms JÓZEFA SZCZUREK-ŻELAZKO

Secretary of State

Ministry of Health in Poland

FOREWORD

A healthy start to life without maltreatment and adversity in childhood is a mainstay of the actions required to reduce inequity in Europe and achieve the goals of Health 2020. Child maltreatment is the product of social, cultural, economic and biological factors, and occurs in all societies and countries in the WHO European Region. It is a leading cause of health inequality and social injustice, with the socioeconomically disadvantaged more at risk. Estimates based on combined analyses of studies suggest that tens of millions of children in the Region suffer from some form of sexual, physical and/or emotional abuse, and neglect during their childhood. Most child abuse and neglect occurs in the community and is commonly associated with other adversity in households where there is dysfunction. These other types of adverse childhood experiences include witnessing parental violence, parental separation, or living with a household member who has a mental illness, drug or alcohol problem, or may have been incarcerated. Such adverse childhood experiences may affect child development and lead to health-harming behaviours, such as smoking, alcohol and drug misuse, mental illness and self-harm, and physical inactivity, which may lead to noncommunicable diseases and early death.

Adverse childhood experiences are thus grave public health and societal problems with far-reaching consequences for the mental and physical health of children and for societal development. The consequences of such adversity may affect people throughout the life-course, resulting in high costs to society. In response to the public health and societal burden of child maltreatment, Member States of the WHO European Region have endorsed “Investing in children: the European child maltreatment prevention action plan 2015–2020”. The importance of stopping violence and adversity in children has also been prioritized in the 2030 Agenda for Sustainable Development, and the adoption of Sustainable Development Goal target 16.2, which calls for an end to all violence against children.

WHO has worked with several Member States to demonstrate the scale of the problem of child maltreatment and other adversity in childhood through a series of surveys of adverse childhood experiences in young people. The “Survey of adverse childhood experiences and associated health-harming behaviours among Polish students” has contributed to the growing evidence base in Europe. We at the WHO Regional Office for Europe hope that this report will stimulate debate on the importance of investing in programmes for the prevention of maltreatment and other adversity in childhood in order to assure a healthy start in life.

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WHO Regional Office for Europe

EXECUTIVE SUMMARY

Introduction

Childhood is a special period in human development. It is a time when an individual is heavily dependent on others, primarily on the parents and their care. Previous studies have found that every fifth child (21%) in Poland has experienced physical abuse by adults in the family. A similar proportion of children (22%) experience emotional abuse by familiar adults. Child abuse has notable negative effects at both the individual and societal levels. These are largely health consequences, experienced both in childhood and adolescence, and in later life.

Aim

The main aim of the study was to investigate the prevalence of adverse childhood experiences (ACEs) in Poland, and to examine the relationship between ACEs and health-harming behaviours.

Methodology

A cross-sectional study was undertaken of university students from five Polish universities that were purposefully selected. The study sample comprised full-time students who were in their first-, second- or third year of studies. The survey was conducted by a project team from the Empowering Children Foundation. The questionnaire used in the survey was an adapted version of the Adverse Childhood Experiences questionnaire developed in 1997 by the Centers for Disease Control and Prevention, Atlanta. Before conducting the intended survey, the questionnaire was translated into Polish, and cognitive testing and pilot-testing were carried out. The survey was conducted between 7 November and 14 December 2016 at the five selected Polish universities. A total of 1833 questionnaires were collected during the survey. After data verification, the sample comprised 1722 questionnaires. The survey was approved by the Bioethics Committee of the Mother and Child Institute.

Results

Women constituted 56.85% and men 43.15% of the sample. The respondents' mean age (\pm SD) was 20.46 ± 1.24 years. The largest proportion of respondents had parents with a medium level of education (41.19%).

Adverse childhood experiences

The majority (76.60%) of the respondents reported they had experienced at least one type of ACE; such experiences were more likely to be reported by men than by women (79.00% vs 74.77%, $P < 0.01$), and by persons whose parents had a low level of education (81.21%, $P < 0.05$). Nearly a quarter (24.68%) of the sample had experienced one type of ACE, 18.58% two types, 14.11% three types, and 19.22% at least four types of ACEs. Physical abuse was the most common form of ACE. Of the respondents, 45.93% had been physically abused by their parents

or caregivers in their childhood. Men were significantly more likely to experience this form of abuse than women. Emotional abuse by their family members in childhood was reported by 42.18%. Childhood sexual abuse by someone at least five years older or by an adult was reported by 4.79% of the respondents. Women were significantly more likely to experience this form of abuse than men. Every fourth respondent (25.07%) had been emotionally neglected as a child; 11.69% had been physically neglected and about 7.98% of the respondents had witnessed violence between their parents or caregivers.

The most common type of household dysfunction was living with a family member who abused alcohol (21.30%). The second was household mental illness (19.49%), followed by parental divorce or separation (15.61%). In addition, 4.48% of the respondents lived with a person who had committed a crime and 3.38% with a person who abused street drugs. Analyses show that ACEs often occur together. About half (51.92%) of the students in the sample had experienced at least two types of abuse or family dysfunction in childhood. One fifth (19.22%) of the respondents had experienced at least four such types of ACEs.

Health-harming behaviours

More than one in three respondents (38.97%) had used psychoactive drugs at least once in their lifetime. Nearly a third (27.98%) of the sample reported that they had sometimes felt that they drank too much or that they were alcoholics, while about 5.81% of the respondents reported that they were problem drinkers. Moreover, 31.47% reported that they had smoked at least 100 cigarettes in their lifetime. One in six respondents (16.66%) had cut themselves on purpose. Self-harm was significantly more often associated with women than with men. Moreover, 4.6% of the respondents reported they had attempted suicide. A small proportion of respondents (6.36%) reported they did not have a single close friend or relative who would help them cope with emotional problems or difficult feelings, if they needed such support.

Association between ACEs and health-harming behaviours

When compared to those with no ACEs, the behaviour of students who had experienced four or more types of ACEs was associated with increased suicide attempts, self-harm, early smoking, psychoactive drug abuse, alcohol misuse, early sexual activity and more than three sexual partners. Mental health problems, such as suicide and self-harm, were associated with childhood emotional abuse and emotional neglect. There was also a strong relation between sexual abuse in childhood and having more than three sexual partners.

Discussion

The majority (76.60%) of respondents reported they had experienced at least one type of ACE and nearly 1 in 5 (19.22%) had experienced at least four types of ACEs.

The findings of our study are consistent with evidence from other studies about the association between ACEs and health-harming behaviours. In particular, the findings of this study show that ACEs increase individuals' risks for developing mental health problems, such as suicide attempts. This is similar to the findings in other countries where suicide attempts were particularly frequent among victims

of multiple (four or more) types of ACEs. The association with alcohol misuse and tobacco use suggest that the ACEs in this study are also a risk factor for the development of noncommunicable diseases (NCDs).

Implications for policy action

ACEs not only violate a child's rights, but also increase an individual's risk of developing health-harming and self-destructive behaviours, leading to mental ill-health, NCDs and violence. They also result in poor educational and developmental achievements due to missing work/school due to stress or depression and loneliness. Thus, preventing ACEs can reduce mental ill-health, NCDs, and societal problems and the costs associated with them.

This study highlights the need for enhancing existing and creating new evidence-based prevention programmes, building the capacity of health systems to detect and support dysfunctional families, ensuring better enforcement of existing laws, changing social norms regarding violence and conducting intermittent surveys to track trends in child maltreatment. These prevention programmes require coordinated intersectoral action, implying the need for an intersectoral strategy for prevention of abuse against children.

INTRODUCTION

All human beings, regardless of age, have the right to live without violence and abuse. A safe childhood is guaranteed both by human and children's rights, and by other international regulations. The Preamble to the historical second international document defining the rights of the child, the Declaration of the Rights of the Child (1959), reads: "The child, by reason of his physical and mental immaturity, needs special safeguards and care, including appropriate legal protection, before as well as after birth" (p. 1).

Childhood is a special period in human development. It is very important from the developmental perspective and has a significant influence on the individual's future life. At no other stage of life do people go through so many changes in so many spheres (Szczepaniak, 2016). At the same time, it is a time (especially the first years of life) when the individual is heavily dependent on others, primarily on the parents and their care.

Child abuse has notable negative effects at both the individual and societal levels. These are largely health consequences, experienced both in childhood and adolescence, and in later life (WHO, 2006).

Based on the methodology used in the study conducted in the United States on adverse childhood experiences (ACEs), the World Health Organization (WHO) has commissioned similar studies to be conducted among young people in several countries, including Albania (Qirjako et al. 2013), Montenegro (WHO, 2013), Russian Federation (Kachaeva et al. 2014), Turkey (Ulukol et al. 2014), Lithuania and Latvia (Bellis et al. 2014a). This report discusses the findings from the Polish study commissioned by WHO and conducted by the Empowering Children Foundation in 2016.

THE NATURE AND CONSEQUENCES OF CHILD MALTREATMENT¹

What is child maltreatment?

Child maltreatment refers to the physical and emotional mistreatment, sexual abuse, neglect and negligent treatment of children, as well as to their commercial or other exploitation.

Child maltreatment is a complex issue. Its dynamics and the factors that drive it, as well as effective prevention strategies, all differ markedly according to the victim's age, the setting in which the maltreatment occurs, and the relationship between the victim and perpetrator.

Child maltreatment is recognized internationally as a serious public health, human rights, legal and social issue. Violence against children by adults in the home is one of the least visible forms of child maltreatment, as much of it takes place in the privacy of domestic life. Nonetheless, it is widely prevalent in all societies, although it may not be possible to give absolute numbers. Child maltreatment by adults in the home gives rise to particular difficulties when designing strategies for prevention and victim services, as the perpetrators of the maltreatment are at the same time the source of nurture for the child.

The nature and severity of both the violence itself and its consequences can vary widely. In extreme cases, child maltreatment can lead to death. In the majority of situations involving maltreatment, however, the physical injury itself has a less severe effect in terms of damage to the child's well-being than the acute psychological and psychiatric consequences, and the long-term impact on the child's neurological, cognitive and emotional development, and overall health.

Conceptual definitions of child maltreatment

Child maltreatment

Child maltreatment is defined as: all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power (WHO, 1999).

Physical abuse

Physical abuse of a child is defined as the intentional use of physical force against a child that results in – or has a high likelihood of resulting in – harm to the child's health, survival, development or dignity. This includes hitting, beating, kicking, shaking, biting, strangling, scalding, burning, poisoning and suffocating.

Sexual abuse

Sexual abuse is defined as the involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to,

¹This section is a partial reprint of the publication *Preventing child maltreatment: a guide to taking action and generating evidence* (2006). Geneva: WHO;7–16.

or for which the child is not developmentally prepared, or else that violates the laws or social taboos of society. Children can be sexually abused by both adults and other children who are – by virtue of their age or stage of development – in a position of responsibility, trust or power over the victim.

Emotional and psychological abuse

Emotional and psychological abuse involves both isolated incidents, as well as a pattern of failure over time on the part of caregiver to provide a developmentally appropriate and supportive environment. Acts in this category may have a high probability of damaging the child's physical or mental health, or physical, mental, spiritual, moral or social development. Abuse of this type includes: restriction of movement; patterns of belittling, blaming, threatening, frightening, discriminating against or ridiculing; and other non-physical forms of rejection or hostile treatment.

Neglect

Neglect includes both isolated incidents, as well as a pattern of failure over time on the part of a parent or other family member to provide for the development and well-being of the child – where the parent is in a position to do so – in one or more of the following areas:

- health;
- education;
- emotional development;
- nutrition;
- shelter and safe living conditions.

The parents of neglected children are not necessarily poor. They may equally be financially well-off.

The scale of the problem

According to WHO, child maltreatment leads to the premature death of at least 850 children under 15 years of age in the European Region every year. Analyses of community surveys in different countries showed that 22.9% of respondents experienced physical abuse and 29.1% mental abuse, with no gender difference. It was estimated that 9.6% of respondents were sexually abused; this affected girls more often than boys (13.4% vs 5.7%). Worldwide research shows the high prevalence both of physical (16.3%) and emotional neglect (18.4%). Applying these figures to the population of children in Europe would suggest that 18 million children experience sexual abuse, 44 million physical abuse and 55 million mental abuse. To better understand the scale of the problem, the risk factors and long-term consequences of maltreatment, more studies with the same methodology should be undertaken. Most forms of maltreatment are mild and do not require investigation by child protection agencies, but warrant supportive parental interventions by welfare and family support services (WHO, 2014b).

The consequences of child maltreatment

The health and social consequences of child maltreatment are more wide-ranging than death and injury alone, and include major harm to the physical and mental health and development of victims. Studies have indicated that exposure to maltreatment and other forms of violence during childhood is associated with risk

factors and risk-taking behaviours later in life. These include violent victimization and the perpetration of violence, depression, smoking, obesity, high-risk sexual behaviours, unintended pregnancy, and alcohol and drug use. Such risk factors and behaviours can lead to some of the principal causes of death, disease and disability – such as heart disease, sexually transmitted infections, cancer and suicide. Child maltreatment therefore contributes to a broad range of adverse physical and mental health outcomes that are costly, both to the child and to society, over the course of a victim's life (Gershoff & Grogan-Kaylor, 2016; UNICEF, 2014; WHO, 2014b).

The costs of child maltreatment

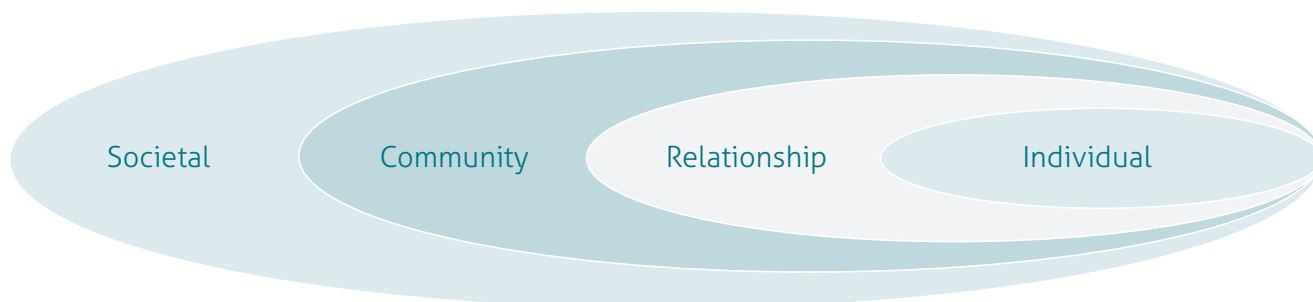
In addition to the health and social costs associated with child maltreatment, there is a huge economic impact. The economic costs include direct medical costs; lost earnings and tax revenue due to premature death; the need for special education, psychological and welfare services, protective services, foster care, preventive services; and adult criminality and subsequent incarceration related to child maltreatment (Fromm, 2001; Fang et al. 2012).

Susceptibility and risk factors

No single factor on its own can explain why some individuals behave violently towards children or why child maltreatment appears to be more prevalent in certain communities than in others. As with other forms of violence, child maltreatment is best understood by analysing the complex interaction between a number of factors at different levels – an understanding that is vital for dealing effectively with the problem. Fig. 1 presents an ecological model outlining the interplay of these different factors.

The first level of the model, that of the **individual**, deals with biological variables such as age and sex, but also an infant with high needs, together with factors of personal history that can influence an individual's susceptibility to child maltreatment. An increased risk of child maltreatment is associated with the presence of certain factors in the parent or other family members (e.g. has difficulty bonding with a newborn child or was maltreated as a child).

Fig. 1. Ecological model describing the risk factors for child maltreatment



The **relationship** level examines an individual's close social relationships – for instance, with family members or friends – that influence the individual's risk of both perpetrating and suffering maltreatment (e.g. violence in the family; lack of a parent; physical, developmental or mental health problems of a family member). Factors at the **community** level relate to the settings in which social relationships take place – such as neighbourhoods, workplaces and schools – and the particular characteristics of those settings that can contribute to child maltreatment (e.g. tolerance of violence, gender and social inequality in the community, lack of services to support families and institutions, and to meet specialized needs, poverty).

Societal factors involve the underlying conditions of society that influence maltreatment – such as social norms that encourage the harsh physical punishment of children, weak enforcement of laws that ban corporal punishment, economic inequalities and the absence of social welfare safety nets, and social and cultural norms that condone the use of violence.

Although more research is required to fully understand the dynamics of these factors at all levels of the ecological model and across different cultures, there is already a substantial body of knowledge about what can increase susceptibility to child maltreatment.

Factors that increase susceptibility to child maltreatment are known as risk factors, and those that decrease susceptibility are referred to as protective factors. The risk factors are not necessarily by themselves diagnostic of child maltreatment wherever they are detected. However, in places where resources are limited, children and families where several of these factors are present should receive services on a priority.

Protective factors

In the same way that there are factors that increase the susceptibility of children and families to child maltreatment, there are also factors that may offer a protective effect. Unfortunately, there has been very little systematic research on these protective factors and they are not well understood. Research to date has focused mainly on resilience factors – that is, factors that lessen the impact of child maltreatment on a victim. Factors that appear to facilitate resilience include secure attachment of the infant to an adult family member, high levels of parental care during childhood or a warm and supportive relationship with a non-offending parent.

Little is known about what factors protect families and children against new instances of child maltreatment. A few studies have shown that living in communities with strong social cohesion has a protective effect and can reduce the risk of violence, even when other family risk factors are present.

Based on the current understanding of early child development, the risk factors for child maltreatment and evidence of the effectiveness of certain prevention strategies, it is clear that stable family units can be a powerful source of protection for children. Good parenting, strong attachment between parents and children, and positive non-physical disciplinary techniques are likely to be protective factors. These apparently protective elements should be encouraged, especially in communities with low existing levels of social cohesion.

THE SCALE OF CHILD ABUSE IN POLAND

Violence against children is a major social problem in Poland. This is evidenced by official statistics, according to which 4000 children each year are victims of bullying. Further survey results show that every third child in Poland is a victim of violence from close relatives ([Włodarczyk, 2017](#)).

Poland has made significant progress in protecting children from abuse by strengthening the legal framework to protect children. There are numerous solutions recommended by WHO and other international agencies in the areas of universal prevention (e.g. patronage visits of midwives and nurses) and indicative or selective prevention (such as support programmes for victims), which contribute to better protection of children and more effective realization of their rights. Poland has a national programme for counteracting domestic violence, which includes multidisciplinary approaches to prevent and respond to domestic violence, including violence against children.

Poland does not have a single system for collecting and sharing information on child abuse. Official data are gathered by various institutions and there is a need for better data linkage, and coordination of prevention and response activities.

The “Blue Cards” system is a multi-agency approach that enables the collection of data on domestic violence, including violence against children. The procedure covers all activities undertaken and carried out in connection with a reasonable suspicion of domestic violence. It may be applied by the police, social services, education and health-care facilities, and communal committees for resolving alcohol-related problems. In 2015, 99 749 Blue Cards were created by various services. Help was provided to 37 843 children, including 1301 children with disabilities ([MRPiPS, 2016](#)). More detailed data (such as the form of violence; the number and gender of victims of domestic violence, including the number of children; the number of children placed in care institutions or foster families as a result of domestic violence) are available only when Blue Cards are created by the police, which make the data substantially less representative, because the police are involved mainly in domestic violence between adults and in severe cases. It would be particularly important to have access to the data included in the Blue Cards set up by representatives of the education system, because in all those cases, the victims must have been children.

According to the National Police Headquarters, the number of child victims of domestic violence in Poland has systematically declined – from 56 500 in 2006 to 14 200 in 2016 (7074 girls and 7149 boys). What is also changing is the proportion of child victims in the overall population of victims of domestic violence – from 36% in 2006 to 15% in 2016. Within the Blue Cards procedure, in 2016, 598 children were placed in non-threatening environments (such as a foster family, extended family or an institution) due to domestic violence ([General Police Headquarters, 2017](#)).

One of the very few studies showing the prevalence of the child abuse problem in Poland is the National Assessment of Child Abuse conducted by the Empowering Children Foundation (then Nobody’s Children Foundation) in 2012. The study found that every fifth child (21%) in Poland experienced physical abuse by

adults in the family. A similar proportion of children (22%) experience emotional abuse by adults in the family. Physical abuse is more likely to be experienced by boys (22% vs 19%), while emotional abuse is more likely to affect girls (24% vs 20%). In more than half of all cases, the perpetrators are the children's parents. A slightly lower percentage of children (18%) witness domestic violence against another adult or a child in the family. Moreover, 12% of children experience sexual abuse, including 6% who experience contact abuse (Włodarczyk and Makaruk, 2013; Wójcik, 2013).

In a survey conducted by the Ministry of Family, Labour, and Social Policy (then the Ministry of Labour and Social Policy) in 2014 on a sample of adult Poles ($N=2963$), nearly half of the respondents (47.1%) reported that they knew about cases of child abuse in families; one fourth of the respondents (25.7%) knew about cases of physical abuse. In the same study, 13.4% of the adult respondents reported that they had been abused in childhood, and 3.4% admitted that they had physically abused their own children (Miedzik & Godlewska-Szurkova, 2014).

In 2014, the Ministry of Family, Labour, and Social Policy conducted a survey among students between 11 and 17 years of age ($N=1210$), 46% of whom reported that more than half of their peers had experienced at least one type of physical abuse. According to the respondents, physical abuse was the most frequent form of maltreatment, compared to neglect (which was experienced by more than half of their peers according to 32% of the children), emotional abuse (23%) or sexual abuse (23%). Thirty-two per cent of the respondents knew at least one peer in their environment who had experienced some form of abuse (Miedzik, 2014).

The perpetrators of both physical and emotional abuse of children are usually their parents; in most cases, fathers. The most likely form of parental abuse depends on the child's gender. Girls are more likely to experience emotional abuse, while boys are at a higher risk of physical abuse. When it comes to emotional abuse, boys are more likely to be abused by their fathers, and girls by their mothers. No such relationship was found for physical abuse (Miedzik & Godlewska-Szurkova, 2014; Wójcik, 2013).

Physical abuse by parents or caregivers is often inflicted in the form of corporal punishment or spanking (WHO, 2006; UNICEF, 2014). The majority of parents in Poland (75%) have spanked their child at least once in their lifetime, and one in five parents (21%) has done it many times. Despite the legal ban on corporal punishment, which was introduced in 2010, half of the Polish people (50%) still approve its use by parents (Makaruk, 2013).

The mental health of children and young adults is becoming one of the biggest issues in Poland. In recent years, the number of children and adolescents who need specialized help due to mental disorders has grown. By 2015, more than 143 000 people up to the age of 18 years had used such assistance, more than 61% of whom were boys. Every year in Poland, several thousand children and adolescents are hospitalized due to mental disorders and behavioural breakdowns. In 2015, this number was the highest in a dozen or so years and reached 10 127 people up to 19 years of age, but it should be noted that between 2003 and 2015, increasing numbers of children aged 1–4 years were affected (Szredzińska, 2017).

The number of suicide attempts in Poland is high. In 2015, it reached the highest rate of 481 attempts, and included 12 children by 12 years of age. In 2016, this

indicator was slightly lower – 475 attempts. In 2016, 103 suicide attempts ended in the death of a child. In 2015, suicide was the second most common cause of death among children and adolescents in the 10–19 years age group – one in five deaths in this group resulted from suicide. Boys were more than four times more likely to attempt suicide than girls. In terms of the number of suicide attempts made by children and youth under 19 years, Poland's death rate in 2014 ranked second in Europe, behind Germany ([Szredzińska, 2017](#)).

ADVERSE CHILDHOOD EXPERIENCES AND HEALTH-HARMING BEHAVIOURS

The relationship between negative childhood experiences and health behaviours was the subject of the Adverse Childhood Experiences (ACE) study conducted in the United States of America (USA) on a sample of 13 494 respondents. Findings from the survey support the idea that childhood experiences of abuse or family dysfunction contribute to health problems in adulthood. This and other studies found a strong relationship between ACEs and smoking, poor diet, low physical activity, alcohol and drug abuse, depression, suicide attempts and violence perpetration ([WHO, 2006](#); [Felitti et al. 1998](#); [Bellis et al. 2014b](#)).

Links between health-harming behaviours and childhood experiences probably operate through the impact of ACEs on the developing brain. Early trauma can lead to structural and functional changes in the brain and its stress regulatory systems. These affect factors such as emotional regulation and fear response, which can predispose individuals to harmful behaviour ([Bellis et al. 2014b](#)).

Studies that combine findings from the neurosciences and large epidemiological research on the long-term effects of ACEs found a strong relationship between early adverse experiences and substance use and abuse (illicit drugs, alcohol and nicotine) later in life ([Anda et al. 2006](#)).

ACEs appear to be associated also with changes in the nervous, endocrine and immune systems. Studies suggest that stressful experiences in childhood may induce significant biological responses, and thus influence the physiological response to stress in adult life ([Danese & McEwen, 2012](#)).

METHODOLOGY

The study was based on a WHO methodology, and on similar studies in a number of European countries (Meinck et al. 2016), primarily Central and Eastern Europe, i.e. the former Yugoslav Republic of Macedonia (Raleva et al. 2013), Serbia (Paunovic et al. 2015), Romania (Baban et al. 2013) and Albania (Qirjako et al. 2013).

Goals of the study

The main aim of the study was to investigate the prevalence of child maltreatment and other ACEs in Poland, and to examine the relationship between ACEs and health-harming behaviours.

Sample

We undertook a cross-sectional study of university students from five Polish universities that were purposefully selected (Table 1 and Fig. 2).

The study sample comprised full-time students who were attending their first-, second- or third year of studies. The survey was conducted by a project team from the Empowering Children Foundation. According to the Central Statistical Office (Central Statistical Office, 2016) data, there are more than 400 institutions of higher education in Poland (in the academic year 2014/2015 there were 415 higher education facilities, but not all of them were active).

Table 1. Universities participating in the study

No.	Name of facility	Location	Public/ private	Profile	No. of full-time students (2015)
1	Adam Mickiewicz University in Poznań	Western Poland – Wielkopolskie (Greater Poland) Province	Public	Non-technical	30 478
2	University of Białystok	Eastern Poland – Podlaskie Province	Public	Non-technical	9 024
3	Silesian University of Technology	Southern Poland –Śląskie (Silesian) Province	Public	Technical	16 867
4	Gdańsk University of Technology	Northern Poland – Pomorskie (Pomerania) Province	Public	Technical	20 070
5	Kazimierz Pułaski University of Technology and Humanities in Radom	Central Poland – Mazowieckie (Masovian) Province	Public	Technical and non-technical	4 120 (2016)

Fig. 2. Universities selected to participate in the study



In the academic year 2015/2016, these were attended by 1405 100 students; 1075 200 (76.5% of the overall student population) at public higher education institutions and 329 900 students (23.5%) at private ones. The largest proportion of students attended universities (422 200) and higher schools of technology (301400).

The sample was limited to first-, second- and third-year students of full-time courses for two reasons: easier access to respondents (enabling random selection of representative samples at each facility) and the students' age.

The study adopted the methodology presented in the publication *Preventing child maltreatment: a guide to taking action and generating evidence* (WHO, 2006) that had been used in similar studies in other countries. Two-stage sampling was applied: the first stage involved arbitrary sampling of higher education institutions, followed by multistage group sampling.

To ensure a diverse sample, we selected higher education institutions arbitrarily based on the following four criteria: location (different regions of Poland), type (public versus non-public), number of students (different size categories) and profile (technical/other). At the first stage of the sampling process, we invited the selected facilities (four public and one non-public) to take part in

the study. The number of public and non-public universities corresponded to the proportion of students in public and non-public facilities (Central Statistical Office, 2016). We forwarded written invitations to them, together with recommendation letters from the Ministry of Health and WHO. After the authorities of one of the facilities rejected the invitation, another facility meeting similar criteria was selected to replace it. Finally, the non-public institution that had been originally selected for the study turned out to have an insufficient number of students. Moreover, in selected non-public facilities, more than 80% of students were foreigners. This disproportion led to the decision of replacing the non-public university by a public facility (Table 1).

At the second stage, we randomly selected a separate sample of full-time students of years 1–3 from each of the five universities. The sampling frame consisted of the lists provided by the University, containing information about the number of students by faculty/department, specialty and year of study. The sampling unit was a hypothetical group of 30 students, except for the Kazimierz Pulaski University of Technology and Humanities in Radom, where 10-student groups were selected due to smaller numbers of students in each department/specialty. Each department/faculty was assigned a specific number of groups, based on the department size (number of students).

We used the SPSS.23 software to randomly select departments with probability matching the number of groups for each department, taking into account the specialty and year of study. At the second stage, we used simple random sampling to select a number of groups from each department (according to the department size).

We collected 1833 questionnaires in the survey. After data verification, the sample comprised 1722 questionnaires. The overall response rate was 94%. The sample consisted of students of the Silesian University of Technology ($n=361$), Gdańsk University of Technology ($n=360$), University of Białystok ($n=356$), Adam Mickiewicz University in Poznań ($n=338$), and Kazimierz Pulaski University of Technology and Humanities in Radom ($n=307$) (Table 2).

Table 2. Response rates by university

University	Number of questionnaires			Response rate (in %)
	Collected	Completed correctly	Rejected	
University of Białystok	386	356	30	92.23
Gdańsk University of Technology	393	360	33	91.60
Silesian University of Technology	367	361	6	98.37
Adam Mickiewicz University in Poznań	355	338	17	95.21
Kazimierz Pulaski University of Technology and Humanities in Radom	332	307	25	92.47
Total	1833	1722	111	93.94

Questionnaire

The questionnaire used in the survey was an adapted version of the Adverse Childhood Experiences (ACE) questionnaires developed by the Centers for Disease Prevention and Control and Kaiser Permanente in 1995 (Krug et al. 2002). These are two questionnaires: Family Health History Questionnaire and Physical Health Appraisal Questionnaire, each developed in two versions, one for male and the other for female respondents. Our study used items from the Family Health History Questionnaire translated and adapted into Polish (in two versions for male and female respondents).

The Family Health Questionnaire includes questions about the following:

- Childhood abuse (physical, emotional and sexual abuse; and physical and emotional neglect);
- Family dysfunction (parental divorce or separation, household substance abuse, household mental illness, witnessing domestic violence and household crime);
- Health-harming behaviours (smoking; early smoking at ≤ 15 years; self-perception as an alcoholic; hazardous drinking; psychoactive drug use; suicide attempts; early sexual activity at ≤ 16 years; number of sexual partners (>3); self-harm; running away from home; low physical activity; absence from work/school due to stress or feeling depressed; absence from work/school due to poor physical health; lack of close friends/supportive relatives).

It also contains questions on the respondent's sociodemographic data, e.g. age, level of parental education, marital status, employment status.

In the process of adaptation and consultation with National Advisory Committee members, a few questions were added (e.g. Have you ever hurt yourself on purpose? Have you ever used pharmaceuticals to get high? Have you ever used designer drugs?) to the original questionnaire and some questions were removed.

Pilot study

Before conducting the intended survey, we carried out cognitive testing of the questionnaire between 6 and 28 September 2016.

There were 17 respondents in the pilot study, including 8 women and 9 men aged 20–25 years. The respondents were students of the technical, medical and social sciences. After the participants became familiar with the questionnaire and completed it, we conducted individual interviews with them. They were asked to share their comments after completing the questionnaire, their opinions about its language, comprehensibility and adequacy, and any other difficulties that might have emerged while answering the questions.

The respondents assessed the questionnaire as being generally clear. Based on their comments, we introduced some minor linguistic changes into the tool. We removed some questions from the questionnaire, e.g. How many times have you been married? or Have you ever injected street drugs?

In the second phase of the pilot study, we conducted a survey in three groups of students at two higher education institutions in Warsaw. The total number of

students was 68 (54 women and 14 men). We introduced some further minor language changes in the questionnaire and improved the survey procedure.

Survey procedure

We carried out the survey between 7 November and 14 December 2016 at five Polish universities by a project team that was specially trained and had received written instructions on how to conduct the survey. Each university appointed a coordinator responsible for the organization of the study, who would contact the selected faculties and develop the timetable.

We conducted the survey in the auditorium format, during classes. Before completing the questionnaire, we informed the students about the purpose of the study, its voluntary nature and the completion procedure. We also assured them that the survey was anonymous and asked them to give their oral consent for taking part in the study. Due to the sensitivity of the questions in the survey, we gave the respondents a leaflet containing information on where to seek psychological support. The leaflet provided an email address and the telephone number of a psychological helpline.

We then gave each respondent a self-administered questionnaire in paper form and asked them to complete it. The average completion time was 21 minutes (range: 7–39 minutes). To make the respondents feel as comfortable as possible, we asked them to put their completed questionnaires in individual envelopes, which we then placed in the group's larger envelope.

Ethical considerations

On 12 October 2016, the survey was approved by the Bioethics Committee of the Mother and Child Institute (Opinion no. 35/2016).

Additionally, we discussed both the tool and the survey procedure with a psychologist, who also provided psychological training for the research team.

The survey was anonymous. We did not collect any personal data during the study and the respondents were not asked to sign separate written consent forms. Completion of the questionnaire was regarded as their consent for participating in the study.

Data analysis

We used the PSPP 0.10.1 software to analyse the survey data. After a database was created, we verified it by checking the correctness of the data in selected questionnaires. We excluded from data analysis those questionnaires with significant amounts of missing data (i.e. at least one quarter of the questionnaire was blank), or those with data missing on age, those filled out by persons born before 1991 and by individuals who were under 18 years at the time of the survey.

We conducted descriptive statistics (mean, standard deviation) and analyses, which included chi-square test to determine whether the variables were independent. We used inferential statistics, including logistic regression, to detect relationships among variables. In particular, logistic regression determined the odds of the outcome variable (e.g. self-perception as an alcoholic) on the basis

of the independent variables (potential causes), after adjustment for potential confounders of age, sex and parental education. *P*-values below 0.05 were regarded as statistically significant in all the statistical analyses. Missing values were excluded from the analyses.

The ACE survey results and health-harming behaviours were adjusted for gender and age of the respondents, and parents' education. In the final analysis, adjusted odds ratios were calculated for different health-harming behaviours as outcomes after incremental exposure to one to four or more types of ACEs compared to no ACEs.

Variables used in the report

Based on 35 selected questions in the questionnaire, we identified 11 ACE categories (*see* Annex, Table 1): physical abuse, sexual abuse by adults, emotional abuse, physical neglect, emotional neglect, witnessing domestic violence, parental divorce or separation, household crime, household alcohol misuse, household street drugs misuse and household mental illness.

The variables categorized as health-harming behaviours and lifestyle patterns included the following (*see* Annex, Table 2): smoking, early initiation of smoking (≤ 15 years of age), self-perception as an alcoholic, hazardous drinking, psychoactive drug use, suicide attempts, early initiation of sexual activity at ≤ 16 years, number of sexual partners (> 3), self-harm, running away from home, low physical activity (physical activity less frequent than twice a week for 30–59 minutes), absence from work/school due to stress or feeling depressed (at least one day in the preceding month), absence from work/school due to poor physical health (at least two days in the preceding month), lack of close friends/supportive relatives.

The demographic variables used in analysis included gender, age and parents' education (combined mother's and father's education).

RESULTS

Sociodemographics

Women constituted 56.85% and men 43.15% of the sample. The proportion corresponded to the proportion of female and male students in Poland. According to Central Statistical Office, in academic year 2016/2017, women accounted for 58% and males for 42% of all higher education students (Central Statistical Office, 2017). The respondents' mean age (\pm SD) was 20.46 ± 1.24 years (range: 18–25 years). The majority of those participating in the study (99.7%) had never been married. More than half (56.09%) were not employed, 22.5% worked irregularly, and 13.63% were engaged in internships (as part of their studies) or voluntary work.

The mean maternal age at birth was 27.6 ± 5.26 years. The largest proportion of the respondents' fathers (40.95%) had basic vocational education, whereas the largest proportion of their mothers (42.27%) had higher (i.e. college or university) education. A combined "parents' education" variable was used in the data analyses; it was obtained by adding up the maternal and paternal education levels using their assigned values, i.e. elementary (1), basic vocational (2), high school (3), college/university (4). As a result, three categories of parental education were obtained: low (value ≤ 4), medium (value 5–6) and high (value 7–8). The largest proportion of respondents had parents with a medium level of education (41.19%).

At the time of the study, the majority of respondents (76.36%) had been living at their present residence (e.g. house or apartment) for at least 2 years. More than a half (53.10%) had also never changed residence in their childhood.

Table 3. Characteristics of the study sample²

Characteristic	<i>n</i>	%
Gender		
Women	979	56.85
Men	743	43.15
Age (years)		
18–19	421	24.46
20	514	29.87
21	498	28.94
22–25	288	16.73
Marital status		
Single	1589	92.38
Living together with a partner	125	7.27
Married/separated	6	0.35

² Missing data were excluded.

Table 3. (contd)

Characteristic	<i>n</i>	%
Employment status		
Working at least 40 hours a week	40	2.33
Working less than 40 hours a week	139	8.10
Irregular work	386	22.48
Internship/voluntary work	234	13.63
Not employed	963	56.09
Mother's education		
Elementary	48	2.89
Basic vocational	377	22.67
High school	535	32.17
College/university	703	42.27
Father's education		
Elementary	64	3.95
Basic vocational	663	40.95
High school	445	27.49
College/University	447	27.61
Parents' education (combined mother and father's education)		
Low	346	21.76
Medium	655	41.19
High	589	37.04
Mother's age at birth (years)		
16–19	37	2.22
20–24	485	29.04
25–29	580	34.73
30–35	419	25.09
36 or more	149	8.92
Time living at current residence		
Less than 6 months	239	14.34
6–12 months	46	2.76
More than 1 year, less than 2 years	109	6.54
2 years or more	1273	76.36
Number of residence changes in childhood		
0	892	53.10
1	496	29.52
2–3	216	12.86
4 or more	76	4.52

Adverse childhood experiences

We included 11 categories of ACEs in the analyses: (1) physical abuse, (2) sexual abuse, (3) emotional abuse, (4) emotional neglect, (5) physical neglect, (6) witnessed domestic violence, (7) parental divorce or separation, (8) household criminality, (9) household alcohol misuse, (10) household street drug misuse, and (11) household mental illness and/or suicide attempt. Tables 4–6 show the association of ACEs with gender, age and parental level of education.

The majority (76.60%) of the respondents reported they had experienced at least one type of ACE; such experiences were more likely to be reported by men than by women (79.00% vs 74.77%, $P<0.01$), and by persons whose parents had a low level of education (81.21%, $P<0.01$). The study found that 23.68% of the sample experienced one form of ACE, 18.58% two forms, 14.11% three forms and 19.22% at least four forms. A small proportion of the sample (1.21%) reported at least eight forms of maltreatment. The mean number of type of ACEs reported was 2.02, the mode reached 1 and median 2 (Tables 4–6).

Table 4. Adverse childhood experiences by gender

Type of experience	Total		Women		Men		P
ACE	n	%	n	%	n	%	
Physical abuse	791	45.93	407	41.57	384	51.68	<0.01
Sexual abuse	81	4.79	63	6.56	18	2.47	<0.01
Emotional abuse	725	42.18	409	41.86	316	42.59	0.76
Emotional neglect	431	25.07	266	27.23	165	22.24	<0.05
Physical neglect	201	11.69	101	10.33	100	13.48	<0.05
Witnessed domestic violence	137	7.98	95	9.72	42	5.68	<0.01
Parental divorce or separation	268	15.61	173	17.67	95	12.87	<0.01
Household crime	77	4.48	44	4.49	33	4.46	0.97
Household alcohol misuse	366	21.30	233	23.85	133	17.95	<0.01
Household street drug misuse	58	3.38	31	3.17	27	3.66	0.58
Household mental illness	335	19.49	223	22.78	112	15.14	<0.01
No. of ACE categories							
0	403	23.40	247	25.23	156	21.00	<0.01
1	425	24.68	210	21.45	215	28.94	
2	320	18.58	174	17.77	146	19.65	
3	243	14.11	137	13.99	106	14.27	
4 or more	331	19.22	211	21.55	120	16.15	

Physical abuse

Close to half (45.93%) of the respondents had experienced physical abuse by their parents or caregivers in their childhood. Men were significantly more likely to experience this form of abuse than women (51.68% vs 41.57%, $P<0.01$) (Table 4), and it was also more prevalent among older respondents aged 22–25 years than younger ones aged 18–19 years (50.00% vs 39.90%, $P<0.05$) (Table 5). There was no significant association with parents' education (Table 6). Of those participating in the survey, 16.68% were pushed, grabbed, shoved or slapped, or their parents/caregivers threw objects at them. A small proportion of respondents (5.11%) were hit so hard that they had marks or injuries.

Table 5. Adverse childhood experiences by age

Type of experience	Age (years)								P
	18–19		20		21		22–25		
ACE	n	%	n	%	n	%	n	%	
Physical abuse	168	39.90	235	45.72	243	48.80	144	50.00	<0.05
Sexual abuse	28	6.78	17	3.33	20	4.12	16	5.69	0.07
Emotional abuse	178	42.38	219	42.61	199	40.04	129	44.95	0.60
Emotional neglect	122	29.05	119	23.15	112	22.54	78	27.18	0.07
Physical neglect	44	10.45	59	11.48	60	12.07	38	13.24	0.71
Witnessed domestic violence	28	6.68	45	8.75	33	6.67	31	10.76	0.13
Parental divorce or separation	67	16.07	73	14.20	79	15.86	49	17.07	0.72
Household crime	18	4.30	20	3.89	22	4.42	17	5.92	0.60
Household alcohol misuse	78	18.62	110	21.44	112	22.54	66	22.92	0.44
Household street drug misuse	18	4.31	11	2.14	14	2.81	15	5.24	0.07
Household mental illness	75	17.9	103	20.04	89	17.87	68	23.69	0.18
No. of ACE categories									
0	111	26.37	119	23.15	115	23.09	58	20.14	0.15
1	85	20.19	137	26.65	136	27.31	66	22.92	
2	80	19.00	93	18.09	91	18.27	56	19.44	
3	70	16.63	74	14.40	56	11.24	43	14.93	
4 or more	75	17.81	91	17.70	100	20.08	65	22.57	

The most common form of physical abuse experienced by the respondents was corporal punishment in the form of spanking; 41.26% reported they had been spanked at least a few times a year. Men were significantly more likely to be punished in this way in their childhood than women (46.21% vs 37.53%, $P<0.01$), and younger students aged 18–19 years were less likely to experience this form of abuse than older ones aged 22–25 years (35.56% vs 46.88%, $P<0.05$). Of the individuals who had been spanked in childhood, 46.57% described the spanking as weak, while 10.08% reported it as hard. The majority of the students who had been physically punished (74.04%) had been spanked for the last time before the age of 10 years.

Table 6. Adverse childhood experiences by parents' education

Type of experience	Parents' education						<i>P</i>
	Low		Medium		High		
ACE	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Physical abuse	165	47.69	317	48.40	248	42.11	0.64
Sexual abuse	16	4.72	33	5.15	29	4.97	0.96
Emotional abuse	160	46.38	279	42.60	226	38.44	0.05
Emotional neglect	109	31.59	154	23.51	124	21.09	<0.01
Physical neglect	53	15.36	81	12.37	50	8.50	<0.05
Witnessed domestic violence	41	11.85	55	8.40	31	5.27	<0.01
Parental divorce or separation	46	13.33	89	13.61	89	15.19	0.96
Household crime	21	6.09	29	4.43	18	3.06	0.86
Household alcohol misuse	104	30.14	148	22.66	77	13.10	<0.01
Household street drug misuse	20	5.83	24	3.67	11	1.87	<0.01
Household mental illness	72	20.87	135	20.64	104	17.69	0.34
No. of ACE categories							
0	65	18.79	150	22.90	159	26.99	<0.01
1	71	20.54	160	24.43	169	28.69	
2	67	19.36	123	18.78	107	18.17	
3	59	17.05	91	13.89	69	11.71	
4 or more	84	24.28	131	20.00	85	14.43	

Sexual abuse

Childhood sexual abuse by someone at least five years older or by an adult was experienced by 4.79% of the respondents. Women were significantly more likely to experience this form of abuse than men (6.56% vs 2.47%, $P<0.01$) (Table 4). There was no significant association of sexual abuse with age (Table 5) and parents' education (Table 6). Out of the four forms of sexual abuse examined in the survey (unwanted touch, making the child touch the abuser's body, trying to have sexual intercourse, or actually having sexual intercourse with the child), the largest proportion of respondents (3.57%) were touched in a sexual way by an adult or someone at least five years older than themselves. For all forms of sexual abuse, the analysis included experiences that occurred before the age of 15 years or between the ages of 15 and 18 years, and that happened against the respondent's will.

Emotional abuse

Emotional abuse was the second most common form of ACE; 42.18% of respondents experienced emotional abuse by their family members in childhood (Table 4). The largest proportion of respondents (31.53%) were called "lazy", "ugly", etc. by people in their family, 19.50% were told hurtful or insulting things, and 13.40% were called names, insulted or humiliated by adult family members. Of the respondents, 17.49% believed that they were emotionally abused in childhood. There was no significant association with gender, age or parents' education.

Emotional neglect

Every fourth respondent (25.07%) reported being emotionally neglected as a child. Women were slightly more likely than men to go through this type of ACE (27.23% vs 22.24%, $P<0.05$) (Table 4); it was also more prevalent among respondents whose parents had a low level of education (31.59%, $P<0.01$) (Table 6). There was no significant association with age (Table 5). The largest proportion of respondents (11.34%) reported they had never or rarely had someone in the family who made them feel important or special, whereas 10.23% felt hated by a family member. Nearly one in ten respondents (9.82%) thought that at least sometimes their parents wished they had never been born.

Physical neglect

The percentage of respondents who were physically neglected as children was 11.69%; this category of ACE was more common among men than women (13.48% vs 10.33%, $P<0.05$) (Table 4) and more prevalent among persons whose parents had a low level of education (15.36%, $P<0.01$) (Table 6). There was no significant association with age. A small percentage (4.03%) of respondents reported that in their childhood, they had never or rarely had someone to take them to the doctor when they needed it; 3.76% of the students reported that sometimes their parents had been too drunk or too high to take care of the family; 2.93% never or rarely had someone around them to take care of them; 2.80% were sometimes or often hungry or had nothing to eat; and 2.00% had to wear dirty clothes.

Witnessed domestic violence

Of the respondents, 7.64% reported that one of their parents/caregivers had sometimes or often pushed, grabbed, shoved, slapped or thrown something at the

other parent/caregiver, and 3.03% reported that one of their parents/caregivers had kicked or bitten the other one or hit her/him with a fist or with something hard. Altogether, 7.98% of the respondents had witnessed violence between their parents or caregivers; more women than men reported experiencing this (9.72% vs 5.68%, $P<0.01$) (Table 4). Individuals whose parents had a low level of education were more likely to witness domestic violence (11.85%, $P<0.01$) (Table 6). There was no significant association with age (Table 5).

Parental divorce or separation

Parental divorce or separation was experienced by 15.61% of respondents; it was more frequently experienced by women than men (17.67% vs 12.87%, $P<0.01$) (Table 4). There was no significant association with age and parents' education (Tables 5 and 6).

Household crime

Household crime was measured by two questions. The first one concerned a childhood experience of living with someone who had gone to prison (2.97% of the respondents); the other one asked about living with someone who had committed a serious crime (2.68%). Altogether, such situations were experienced by 4.48% of the respondents (Table 4). There was no significant association with gender, age and parents' education (Tables 4–6).

Household alcohol misuse

About one in five respondents (21.30%) lived with someone who abused alcohol (Table 4). In most cases (76.22%), it was the respondent's father. Respondents who experienced this kind of dysfunction in the family were more often women than men (23.85% vs 17.95%, $P<0.01$) (Table 4). It was also more prevalent among individuals whose parents had a low level of education (30.14%, $P<0.01$) (Table 6). There was no significant association with age (Table 5).

Household street drug misuse

A small proportion of respondents (3.38%) lived with someone who used street drugs (Table 4). This experience was also more prevalent among individuals whose parents had a low level of education (5.83%, $P<0.01$). There was no significant association with gender and age (Tables 4–6).

Household mental illness

Household mental illness was measured by two questions that asked about living with someone who had depression or another mental illness (17.86%), and living with someone who had attempted to commit suicide (5.37%). Altogether, such experiences were reported by 19.49% of the respondents, significantly more often by women than by men (22.78% vs 15.14%, $P<0.01$) (Table 4). There was no significant association with age and parents' education (Tables 5 and 6).

Health-harming behaviours

Tables 7–9 show the relationships between ACEs and health-harming behaviours.

Smoking

Almost one in three respondents (31.47%) reported having smoked at least 100 cigarettes in their lifetime (Table 7). Smoking was more prevalent among older students aged 22–25 years (40.91%, $P<0.01$) than younger ones (Table 8). Among those who had smoked, 60.75% were still smoking at the time of the study. A small proportion (5.5%) of the respondents had started smoking at a very young age – 15 years or younger (Table 7). Among those who had smoked at least 100 cigarettes in their lifetime, 65% had lived with a smoker in their childhood.

Alcohol abuse

Teetotallers (those who did not drink at all) constituted only 2.61% of the sample. Most respondents (74.95%) had had their first alcoholic drink before the age of 18 years.

Three variables of alcohol abuse were categorized: hazardous drinking – drinking at least 28 (man) or 14 (woman) alcoholic drinks or units of alcohol a week (PARPA, 2010), occasional binge drinking – six or more drinks on one occasion and self-perception as an alcoholic – subjective overuse of alcohol or considering oneself as alcoholic (see Annex Table 2).

Table 7. Health-harming behaviours by gender

Health-harming behaviours	Total		Women		Men		<i>P</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Smoking	539	31.47	316	32.41	223	30.22	0.33
Early smoking ≤15 years	90	5.50	45	4.84	45	6.36	0.18
Self-perception as an alcoholic	477	27.98	250	25.75	227	30.93	<0.05
Hazardous drinking	98	5.81	45	4.66	53	7.34	<0.05
Psychoactive drug use	671	38.97	316	32.28	355	47.78	<0.01
Suicide attempts	79	4.60	50	5.11	29	3.92	0.24
Early sexual activity ≤16 years	200	12.33	103	11.12	97	13.94	0.09
Number of sexual partners >3	151	9.34	68	7.38	83	11.94	<0.01
Self-harm	286	16.66	206	21.04	80	10.84	<0.01
Running away from home	48	2.80	31	3.17	17	2.30	0.28
Low physical activity	925	54.00	595	60.78	330	44.96	<0.01
Absence from work/school due to stress or feeling depressed	292	17.49	205	21.62	87	12.05	<0.01
Absence from work/school due to poor physical health	366	21.79	245	25.63	121	16.71	<0.01
Lack of close friends/supportive relatives	108	6.36	46	4.74	62	8.53	<0.01

Hazardous drinkers comprised 5.81% of the respondents: 7.34% of male students reported that they had at least 28 alcoholic drinks (or units of alcohol) a week, on average, while 4.66% of female students had at least 14 alcoholic drinks a week ($P<0.05$) (Table 7). Furthermore, 21.8% of the respondents reported they had had 6 or more drinks on one occasion. Men were more likely than women to get drunk occasionally (31.91% vs 14.03%, $P<0.01$). Almost a third (27.98%) of the sample reported that they had sometimes considered that they had drunk too much or were alcoholic. Men were more likely than women to have such thoughts (30.93% vs 25.75%; $P<0.05$).

Table 8. Health-harming behaviours by age

Type of experience	Age (years)								P
	18–19		20		21		22–25		
Health-harming behaviours	n	%	n	%	n	%	n	%	
Smoking	114	27.34	159	30.99	149	30.04	117	40.91	<0.01
Early smoking ≤15 years	24	6.00	26	5.26	21	4.44	19	7.06	0.47
Self-perception as an alcoholic	118	28.30	130	25.69	137	27.68	92	32.17	0.28
Hazardous drinking	24	5.70	33	6.42	23	4.62	18	6.25	0.63
Psychoactive drug use	144	34.20	191	37.16	201	40.36	135	46.88	<0.01
Suicide attempts	22	5.24	22	4.29	18	3.61	17	5.94	0.43
Early sexual activity ≤16 years	56	13.79	59	12.29	49	10.40	36	13.64	0.42
Number of sexual partners >3	25	6.16	37	7.71	44	9.38	45	17.24	<0.01
Self-harm	90	21.53	81	15.76	64	12.85	51	17.83	<0.01
Running away from home	11	2.63	12	2.34	13	2.61	12	4.18	0.47
Low physical activity	227	54.57	282	54.97	257	51.81	159	55.40	0.70
Absence from work/school due to stress or feeling depressed	63	15.40	90	18.07	79	16.26	59	21.38	0.19
Absence from work/school due to poor physical health	75	18.29	100	19.84	106	21.90	84	29.89	<0.01
Lack of close friends/ supportive relatives	20	4.85	34	6.64	34	6.97	20	7.02	0.54

Psychoactive drug use

Use of psychoactive drugs, at least once in their lifetime, was reported by 38.97% of the students. More men than women reported this (47.78% vs 32.28%; $P<0.01$) (Table 7), and older students aged 22–25 years (46.88%, $P<0.01$) than younger ones (Table 8). Street drugs (such as marijuana, hashish, Ecstasy or amphetamines) were used by 38.4% of the respondents, but about one in three had only tried some marijuana once or twice. When these respondents were excluded, 24.72% of respondents reported that they had used street drugs (and marijuana at least three times). Even within this group, marijuana was the most commonly used street drug – almost everyone had used it (24.03%) and only 5.63% of respondents had used any other street drug. Designer drugs were used by 3.46%, and pharmaceutical drugs (taken to get high) by 3.44%. Pharmaceuticals were the only type of psychoactive drugs that were used by women more often than by men (4.22% vs 2.43%, $P<0.05$).

Table 9. Health-harming behaviours by parents' education

Parents' education							<i>P</i>
	Low		Medium		High		
Health-harming behaviours	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Smoking	109	31.59	192	29.49	201	34.30	0.19
Early smoking ≤15 years	17	5.25	32	5.11	34	6.09	0.74
Self-perception as an alcoholic	96	27.83	180	27.86	168	28.77	0.93
Hazardous drinking	18	5.20	29	4.43	42	7.13	0.11
Psychoactive drug use	133	38.44	240	36.64	250	42.44	0.11
Suicide attempts	16	4.62	27	4.13	27	4.59	0.90
Early sexual activity ≤16 years	32	9.70	79	12.66	76	13.77	0.20
Number of sexual partners >3	22	6.67	57	9.21	60	10.87	0.11
Self-harm	58	16.81	90	13.76	107	18.26	0.09
Running away from home	15	4.35	12	1.84	16	2.72	0.07
Low physical activity	220	63.58	344	53.00	288	49.06	<0.01
Absence from work/school due to stress or feeling depressed	63	18.92	105	16.41	98	17.16	0.61
Absence from work/school due to poor physical health	82	24.40	130	20.22	123	21.47	0.32
Lack of close friends/ supportive relatives	27	7.89	35	5.40	37	6.35	0.31

Sexual activity

Over half (58.74%) of the respondents reported that had already started their sex life. Every eighth respondent (12.33%) had had their first sexual intercourse before the age of 16 years (Table 7). One in 11 respondents (9.34%) reported having had at least four sexual partners; such reports were more frequent among men than among women (11.94% vs 7.38%; $P<0.01$) (Table 7) and older students aged 22–25 years (17.24%, $P<0.01$) than younger ones (Table 8).

Missing school or work

The study found that 17.49% of the respondents had missed at least one day of work/school due to stress or feeling depressed. Over a fifth (21.79%) of the respondents had missed at least two days of work/school due to poor physical health. Female students were more likely than men to miss work or school due to both mental health problems (21.62% vs 12.05%; $P<0.01$) and poor physical health (25.63% vs 16.71%; $P<0.01$) (Table 7). Missing school or work because of poor physical health was more prevalent among older students aged 22–25 years (29.89%, $P<0.01$) than younger ones (Table 8).

Self-destructive behaviours

Self-destructive behaviours were measured as self-harm and suicide attempt. The study found that 16.66% of respondents had cut themselves on purpose. Self-harm was significantly more frequent among women than among men (21.04% vs 10.84%, $P<0.01$) (Table 7) and younger students aged 18–19 years (21.53%, $P<0.01$) than older ones (Table 8).

A small proportion (4.6%) of respondents reported that they had attempted suicide (Table 7). Among them, 55.3% of them had made one suicide attempt, 26.3% two attempts, and 18.4% between three and five attempts. The age at the first suicide attempt ranged from 10 to 21 years. One in five respondents who had tried to take their own lives (19.8%) had first attempted suicide before the age of 15 years.

Low physical activity

The study found that 54% of the respondents did not exercise or rarely exercised more than twice a week, for 30 minutes each time. Women were significantly less physically active than men (60.78% vs 44.96%; $P<0.01$) (Table 7); physical activity was also low among persons whose parents had a low level of education (63.58%, $P<0.01$). Low physical activity was the only behavioural factor that varied significantly across the levels of parental education (Table 9).

Running away

The study found that 2.8% had run away from home for more than one day (Table 7).

Loneliness

The lack of supportive friends and relatives was more often reported by men than by women (8.53% vs 4.74%, $P<0.01$) (Table 7).

Association between ACEs and health-harming behaviours

The main aim of our study was to identify the association between ACEs and health-harming behaviours.

Our study indicates that there was a relatively strong, graded association between health-harming behaviours and the number of ACEs. The number of ACEs especially increases individuals' risks of developing problems associated with self-destructive behaviours (suicide attempts and self-harm), but also with other issues connected to mental health such as missing work/school due to stress or depression and loneliness.

Table 10 shows the prevalence and adjusted relative odds of health-harming behaviours by number of ACEs. The reference group consisted of those who had no ACEs.

Self-destructive behaviour

Individuals who were exposed to at least four types of ACEs in their childhood were significantly more likely to engage in self-destructive behaviour, compared to those who did not have any ACE. In particular, they were more than 17 times as likely (OR=17.42) to attempt suicide, and almost 12 times as likely (OR=11.68) to engage in self-harm. Among respondents who experienced two or three types of ACE, the risk of self-harm was four (OR=4.05) and six (AOR=6.07) times as high compared to students without such experiences.

Psychoactive drug use

The use of psychoactive drug was 86% higher for those who had even one form of ACE (OR=1.86), compared to those who had never had an ACE. Those who had faced four or more types of ACEs had a nearly fourfold increase (OR=3.68) in the risk of psychoactive drug use.

Emotional problems

Significant associations were found between those who reported at least two forms of ACEs and emotional problems. For example, compared to those who had never had an ACE, those who had witnessed at least two forms of ACEs were almost three times as likely to not have any close friends or relatives who could help the individual cope with problems (OR=2.63), and miss work/school due to stress (OR=3.36). The study found that in all cases, the higher the number of ACEs, the higher the risk. For instance, compared to those who had not had any ACE, those who had been subjected to four or more types of ACEs were five times as likely (OR=5.40) to lack close friends and supporting relatives, and almost eight times as likely (OR=7.75) to miss work/school due to stress.

Smoking

The risk of smoking was 1.63 times higher for individuals who had faced two forms of ACE, and more than twice higher among those who had experienced three, four or more types of ACEs (OR=2.03 and OR=2.22), compared to those who had had no ACE. Being subjected to four types of ACEs led to a 4.45 times increased risk for starting to smoke early.

Table 10. Logistic regression – the influence of number of adverse childhood experiences (ACEs) on health-harming behaviours

HEALTH-HARMING BEHAVIOURS	
Smoking	%
	OR (95% CI)
Early smoking ≤15 years	%
	OR (95% CI)
Self-perception as an alcoholic	%
	OR (95% CI)
Hazardous drinking	%
	OR (95% CI)
Psychoactive drug use	%
	OR (95% CI)
Suicide attempts	%
	OR (95% CI)
Early sexual activity ≤16 years	%
	OR (95% CI)
Number of sexual partners >3	%
	OR (95% CI)
Self-harm	%
	OR (95% CI)
Low physical activity	%
	OR (95% CI)
Absence from work/school due to stress or feeling depressed	%
	OR (95% CI)
Absence from work/school due to poor physical health	%
	OR (95% CI)
Lack of close friends/ supportive relatives	%
	OR (95% CI)

Odds ratios (ORs) adjusted for gender, age and parents' education * $P < 0.05$; ** $P < 0.01$; CI: confidence interval

CATEGORIES OF ACEs				
0 (n=403)	1 (n=425)	2 (n=320)	3 (n=243)	4 and more (n=331)
23.50	27.96	32.39	37.86	40.00
1.00 (reference group)	1.22 (0.88– 1.70)	1.63 (1.15– 2.30)**	2.03 (1.40– 2.95)**	2.22 (1.53– 3.21)**
2.37	5.01	4.90	6.84	9.43
1.00 (reference group)	1.80 (0.79–4.11)	1.94 (0.82–4.58)	2.68 (1.12–6.43)*	4.45 (2.0–9.70)**
17.84	24.94	31.23	33.88	36.70
1.00 (reference group)	1.42 (1.00– 2.02)	1.96 (1.36–2.82)**	2.22 (1.50– 3.29)**	2.93 (2.04– 4.22)**
3.55	7.45	5.41	6.25	6.48
1.00 (reference group)	2.49 (1.22–5.08)*	1.88 (0.85–4.12)	2.37 (1.04– 5.38)*	2.51 (1.15– 5.49)*
23.82	38.59	39.69	48.15	50.45
1.00 (reference group)	1.86 (1.35– 2.56)**	2.01 (1.43–2.83)**	2.99 (2.06– 4.34)**	3.68 (2.61– 5.19)**
1.00	1.41	1.88	6.22	14.55
1.00 (reference group)	0.94 (0.24–3.630)	1.58 (0.43– 5.74)	4.69 (1.462– 15.10)*	17.42 (6.13– 49.47)**
7.71	10.71	11.30	13.30	20.00
1.00 (reference group)	1.32 (0.78– 2.21)	1.55 (0.90– 2.67)	1.74 (0.98– 3.10)	3.57 (2.17– 5.86)**
6.38	4.87	8.33	10.30	18.55
1.00 (reference group)	0.54 (0.28–1.05)	1.24 (0.67– 2.30)	1.63 (0.86– 3.09)	3.65 (2.14– 6.25)**
5.01	10.12	16.56	24.38	33.53
1.00 (reference group)	1.99 (1.11–3.55)*	4.05 (2.32– 7.07)**	6.07 (3.44– 10.70)**	11.68 (6.75– 20.19)**
50.25	52.72	56.92	57.08	55.15
1.00 (reference group)	1.17 (0.87– 1.57)	1.34 (0.97– 1.83)	1.25 (0.88 –1.77)	1.25 (0.80 – 1.50)
6.96	13.56	17.48	18.38	34.36
1.00 (reference group)	2.45 (1.46– 4.10) **	3.36 (2.02– 5.70)**	3.11 (1.78– 5.43)**	7.75 (4.71– 12.77)**
15.13	19.86	22.98	21.10	31.60
1.00 (reference group)	1.43 (0.97– 2.11)	1.71 (1.14– 2.56)*	1.50 (0.96– 2.34)	2.63 (1.79– 3.88)**
2.30	4.26	6.65	8.44	12.12
1.00 (reference group)	1.39 (0.59– 3.23)	2.63 (1.17– 5.92)*	3.17 (1.36–7.40)**	5.40 (2.52– 11.58)**

Alcohol abuse

The risk of self-perception as an alcoholic was about twice as high for those individuals who had had two types of ACEs (OR=1.96) and three times as high (OR=2.93) for those who had had at least four types of ACEs, compared to those who had never had an ACE. Respondents with at least four types of ACEs were also more than twice as likely (OR=2.51) to become hazardous drinkers, i.e. to drink large amounts of alcohol.

Sexual activity

Early sexual initiation and larger numbers of sexual partners were significantly associated with those who had had at least four types of ACEs (OR=3.57 and OR=3.65, respectively) when compared to those who had not had an ACE.

Table 11. Logistic regression – influence of adverse childhood experiences on health-harming behaviours

ACE category	Smoking		Early smoking ≤15 years		Self-perception as an alcoholic	
Adjusted odds ratio	OR	95% CI	OR	95% CI	OR	95% CI
Physical abuse	1.30	1.05–1.61*	1.47	0.94–2.30	1.38	1.10–1.72**
Sexual abuse	2.38	1.50–3.79**	3.08	1.51–6.31**	2.18	1.37–3.48**
Emotional abuse	1.63	1.31–2.02**	1.67	1.07–2.61*	1.56	1.25–1.95**
Emotional neglect	1.48	1.16–1.89*	1.22	0.74–2.01	1.54	1.20–1.98**
Physical neglect	1.23	0.89–1.70	1.28	0.67–2.42	1.33	0.96–1.86
Witnessing domestic violence	1.45	0.99–2.11	2.66	1.44–4.92**	1.44	0.98–2.12
Parental divorce or separation	1.25	0.93–1.68	2.1	1.24–3.56**	1.08	0.79–1.47
Household crime	1.35	0.82–2.24	3.5	1.71–7.18**	2.11	1.29–3.45**
Household alcohol misuse	1.28	0.99–1.66	1.38	0.82–2.31	1.69	1.30–2.20**
Household street drugs misuse	2.43	1.41–4.20**	1.47	0.51–4.20	1.53	0.87–2.70
Household mental illness	1.54	1.19–2.00**	1.78	1.08–2.92*	1.81	1.39–2.36**

Odds ratios (ORs) adjusted for gender, age and parents' education; * $P < 0.05$; ** $P < 0.01$; CI: confidence interval

Missing school or work

The respondents who reported at least four types of ACEs were 2.63 times as likely to miss work or school due to poor physical health when compared to those who had not had an ACE.

Running away from home

Because of the small number of people who ran away from home, it was not possible to examine the associations between ACE and people who ran away from home.

Table 11 shows the associations between different types of ACEs and health-harming behaviours.

Very strong associations were found between emotional abuse/neglect with both suicide attempts (OR=7.92 and OR=10.77, respectively) and self-harm (OR=3.85 and OR=3.92, respectively). Sexual abuse was also strongly associated with having more than three sexual partners (OR=6.27).

Hazardous drinking		Psychoactive drug use		Suicide attempts		Early sexual activity ≤16 years		More than three sexual partners	
OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
1.77	1.14–2.76*	1.72	1.39–2.11**	2.03	1.24–3.34**	1.18	0.86–1.61	1.7	1.19–2.45**
2.57	1.22–5.39*	4.26	2.59–7.01**	3.41	1.66–7.00**	2.85	1.65–4.89**	6.27	3.59–10.94**
1.45	0.94–2.23	1.85	1.50–2.28**	7.92	4.11–15.24**	1.54	1.13–2.10**	1.88	1.31–2.69**
1.43	0.88–2.30	1.33	1.05–1.69**	10.77	6.12–18.97**	1.85	1.33–2.57**	1.72	1.17–2.53**
0.68	0.31–1.50	1.05	0.76–1.44	3.12	1.76–5.52**	1.64	1.07–2.51*	1.99	1.25–3.17**
1.06	0.47–2.35	1.82	1.25–2.64**	3.08	1.65–5.75**	2.45	1.55–3.88**	2.61	1.56–4.37**
1.29	0.72–2.29	1.45	1.08–1.93*	1.85	1.03–3.30*	1.93	1.32–2.83**	2.62	1.74–3.96**
0.26	0.04–1.88	1.72	1.05–2.81*	2.74	1.20–6.27*	2.45	1.36–4.42**	2.38	1.22–4.63*
0.69	0.38–1.27	1.63	1.27–2.10**	1.82	1.07–3.10*	1.57	1.09–2.24*	2.04	1.37–3.04**
1.87	0.72–4.87	4.56	2.47–8.41**	3.63	1.41–4.20**	2.01	1.01–4.00*	1.33	0.55–3.24
1.24	0.73–2.10	1.52	1.18–1.96**	3.53	2.15–5.79**	1.64	1.15–2.35**	1.98	1.33–2.96**

Table 11. Logistic regression – influence of adverse childhood experiences on health-harming behaviours (contd)

ACE category	Self-harm		Low physical activity	
Adjusted odds ratio	OR	95% CI	OR	95% CI
Physical abuse	2.22	1.68–2.95**	0.90	0.74–1.11
Sexual abuse	3.5	2.16–5.65**	0.79	0.50–1.25
Emotional abuse	3.85	2.88–5.15**	1.08	0.88–1.33
Emotional neglect	3.92	2.94–5.22**	1.1	0.87–1.39
Physical neglect	1.82	1.24–2.68**	0.64	0.47–0.89**
Witnessing domestic violence	1.83	1.18–2.82**	0.93	0.64–1.34
Parental divorce or separation	1.61	1.14–2.29**	1.29	0.96–1.74
Household crime	1.58	0.87–2.88	0.8	0.49–1.31
Household alcohol misuse	1.68	1.23–2.30**	0.96	0.74–1.23
Household street drugs misuse	2.05	1.08–3.89**	0.71	0.41–1.23
Household mental illness	3.54	2.63–4.76**	1.3	1.01–1.69*

Odds ratios (ORs) adjusted for gender, age and parents' education; * $P < 0.05$; ** $P < 0.01$; CI: confidence interval

Physical abuse

Compared to those who had not been physically abused, respondents who had been physically abused as children by their parents or caregivers were twice as likely to engage in self-harm (OR=2.22), attempt to commit suicide (OR=2.03), become hazardous drinkers (OR=1.77), use psychoactive drugs (OR=1.72), and have more than three sexual partners (OR=1.70).

Sexual abuse

Compared to those who had not experienced sexual abuse, individuals who had been sexually abused as children were six times more likely to have more than three sexual partners (OR=6.27), more than four times as likely to use psychoactive drugs (OR=4.26), 3.5 times more likely to engage in self-harm (adjusted OR [AOR]=3.5) and to attempt suicide (OR=3.41), three times more likely to start smoking early before the age of 15 years (OR=3.08), initiate sexual activity early (OR=2.85), and become hazardous drinkers (OR=2.57). They were also twice more likely to have smoked at least 100 cigarettes in their lifetime (OR=2.38), abuse alcohol (OR=2.18) and miss work/school due to stress (OR=1.83).

Emotional abuse

Compared to those who did not report being victims of emotional abuse, those who had been emotionally abused were nearly eight times more likely to attempt

Absence from work/ school due to stress or feeling depressed		Absence from work/ school due to poor physical health		Lack of close friends/ supportive relatives	
OR	95% CI	OR	95% CI	OR	95% CI
1.29	0.99–1.69	1.21	0.94–1.55	1.47	0.97–2.23
1.83	1.09–3.09*	1.25	0.73–2.12	1.43	0.60–3.43
3.12	2.35–4.13**	1.5	1.17–1.92**	2.2	1.45–3.35**
2.06	1.55–2.75**	1.25	0.94–1.65	5.2	3.39–7.96**
2.02	1.39–2.93**	1.5	1.05–2.16*	3.12	1.94–5.01**
2.18	1.44–3.29**	1.71	1.14–2.55*	1.95	1.05–3.64*
1.6	1.13–2.27**	1.8	1.31–2.47**	1.06	0.59–1.91
2.43	1.42–4.15**	1.11	0.62–1.98	1.43	0.60–3.43
1.74	1.28–2.37**	1.35	1.01–1.81*	1.49	0.93–2.39
3.59	2.01–6.41**	2.22	1.23–3.98**	0.77	0.23–2.55
2.69	2.00–3.61**	1.85	1.40–2.46**	0.99	0.58–1.69

suicide (OR=7.92), almost four times more likely to engage in self-harm (OR=3.85), and three times more likely to miss work/school due to stress (OR=3.12). They were also more likely to lack a close friend or relative who would help them cope with difficulties (OR=2.20), have more than three sexual partners (OR=1.88), use psychoactive drugs (OR=1.85), start smoking early (AOR=1.67), have smoked at least 100 cigarettes in their lifetime (OR=1.63), initiate sexual activity early (OR=1.54) and miss work/school due to poor physical health (OR=1.50).

Emotional neglect

Compared to those who had not been victims of childhood emotional neglect, those who had were almost 11 times more likely to attempt suicide (OR=10.77), five times more likely to lack close friends or supportive relatives (OR=5.20), four times more likely to engage in self-harm (OR=3.92), twice as likely to miss work/school due to stress (OR=2.06), initiate sexual activity early (OR=1.85), and have more than three sexual partners (OR=1.72). They were also more likely to abuse alcohol (OR=1.54).

Physical neglect

Students who had been physically neglected as children, compared to those who had not, were more than three times as likely to attempt suicide (OR=3.12), miss days at work/school due to stress (OR=2.02), have at least three sexual

partners (OR=1.99), engage in self-harm (OR=1.82), and start sexual activity early (OR=1.64). They were also more likely to miss work/school due to poor physical health (OR=1.50).

Witnessed domestic violence

Students who had witnessed violence between their parents or caregivers as children were three times more likely than those who had not to try to commit suicide (OR=3.08), start smoking early (OR=2.66) and have more than three sexual partners (OR=2.61). They were twice as likely to initiate sexual activity early (OR=2.45), miss at least one day of work/school due to stress in the preceding month (OR=2.18), lack close friends or supportive relatives (OR=1.95), and use psychoactive drugs (OR=1.82).

Parental divorce or separation

Respondents whose parents had divorced or separated compared to those whose parents had not had more than three sexual partners (OR=2.62), and were twice as likely to start smoking early (OR=2.10), initiate sexual activity early (OR=1.93), try to commit suicide (OR=1.85), miss work/school due to poor physical health (OR=1.80), and harm themselves on purpose (OR=1.61).

Household crime

Students whose household members had been to prison or committed a serious crime were more likely to start smoking early (OR=3.50), attempt suicide (OR=2.74), and start sexual activity early (OR=2.45). They were also more likely to miss work/school due to stress (OR=2.43), have more than three sexual partners (OR=2.38), abuse alcohol (OR=2.11) and use psychoactive drugs (OR=1.72).

Household alcohol misuse

Respondents whose household members were addicted to alcohol, compared to those whose household members were not, were twice as likely to have more than three sexual partners (OR=2.04), attempt suicide (OR=1.82), miss work/school due to stress (OR=1.74), abuse alcohol (OR=1.69), engage in self-harm (OR=1.68), use psychoactive drugs (OR=1.63), and start sexual activity early (OR=1.57).

Household street drug misuse

Respondents whose household members were addicted to street drugs were almost five times more likely to use psychoactive drugs (OR=4.56) and four times more likely to try to commit suicide (OR=3.63) compared to those whose household members were not addicted. They were also more likely to miss at least one day of work/school due to stress in the preceding month (OR=3.59), twice as likely to have smoked at least 100 cigarettes in their lifetime (OR=2.43), miss work/school due to poor physical health (OR=2.22), engage in self-harm (OR=2.05), and initiate sexual activity early (OR=2.01).

Household mental illness

Compared to respondents whose household members had never suffered from a mental illness, those whose household members had suffered from depression or

another mental illness, or had tried to commit suicide, were much more likely to engage in self-harm (OR=3.54), attempt suicide (OR=3.53), miss work/school due to stress (OR=2.69) or poor physical health (OR=1.85), have more than three sexual partners (OR=1.98), abuse alcohol (OR=1.81), start smoking early (OR=1.78), start sexual activity early (OR=1.64), have smoked at least 100 cigarettes in their lifetime (OR=1.54), and use psychoactive drugs (OR=1.52).

DISCUSSION AND CONCLUSIONS

The majority (76.60%) of the respondents reported that they had had at least one type of ACE and nearly one in five (19.22%) had been subjected to at least four categories of ACEs.

According to Polish students' reports, physical abuse was the most frequent type of ACE. Nearly half (45.93%) of the respondents reported that their parents or caregivers had abused them physically at least sometimes. Men were significantly more likely to experience this form of abuse than women, and it was also more prevalent among older respondents. Surveys conducted in countries of Eastern Europe ([Bellis et al. 2014a](#)) found this form of abuse to be less prevalent, except for Albania, where the prevalence of physical abuse is almost as high as in Poland.

In our study, every sixth student in the sample (17.19%) reported being a victim of moderate-to-severe physical abuse, whereas four out of 10 had experienced corporal punishment. Similar to other countries, this form of abuse was more likely to be perpetrated against boys than girls ([Paunovic et al. 2015](#)). Notably, a significantly larger proportion of respondents (41.26%) reported they had been punished by spanking, which is also a form of physical abuse. The analyses show, however, that this parenting practice has become less prevalent in Poland. Although corporal punishment has been legally banned since 2010, when Art. 961 was added to the Family Code and Caring ([Journal of Laws of 1964 no. 9 item 59](#)), in another survey, 9% of Polish people reported that it can be used when the parent considers it effective, and 41% find it acceptable in certain circumstances. The majority of parents in Poland (75%) reported having spanked their child at least once in their lifetime, and one in five parents (21%) has done it many times ([Makaruk, 2013](#)). A considerable (29%) proportion of people believe in the effectiveness of corporal punishment ([Jarosz, 2013](#)). This belief may be changing, as the current study found that younger students (i.e. 18–19 years) experienced significantly less corporal punishment than older students (i.e. 22–25 years) (36% vs 47%, $P<0.05$). This reduction in physical abuse due to corporal punishment suggests that continued action to enforce the ban on corporal punishment is important, as are efforts such as social marketing to change attitudes to corporal punishment and condone violence. Emotional abuse was the second most frequent type of ACE. It was reported by 42.59% of the respondents, who said that their parents or caregivers had abused them emotionally at least sometimes. There was no significant difference between men and women in this respect. In other countries in Eastern Europe, this form of abuse was less prevalent ([Bellis et al. 2014a](#)).

In Poland, 4.79% of the respondents had been sexually abused as children by an adult or someone at least five years older than themselves. Similar to other studies, child sexual abuse was more likely to be experienced by women than by men ([Sethi et al. 2013](#)). The percentage of respondents who had been sexually abused in childhood was significantly lower than in Albania and slightly higher than in Montenegro and Lithuania ([Bellis et al. 2014a](#)).

Living with a household member who abused alcohol was the most prevalent form of family dysfunction. More than one fifth of the respondents (21.30%) reported

that at least one of their household members had this problem. The proportion of respondents living with someone who abused alcohol was particularly high compared to Montenegro, the Russian Federation, the former Yugoslav Republic of Macedonia and Turkey (Bellis et al. 2014a). Of the respondents, 19.49% had a family member with mental illness; this was more frequently reported to be the case among women than men. This finding is comparable to the findings from Latvia (18.8%), though lower than that in some other countries (from 5.6% in Montenegro to 13.8% in Romania) (Bellis et al. 2014a). Our study found that 15.61% of the students had experienced parental divorce or separation. This was similar to the rates found in Romania and the Russian Federation, higher than that in the former Yugoslav Republic of Macedonia, Turkey, Albania and Montenegro (3.8–9.5%), and substantially lower than in Latvia (42.3%) (Bellis et al. 2014a).

A small proportion (7.98%) of respondents had witnessed violence between their parents or caregivers. This type of ACE is slightly less frequent in Poland than in most countries of Eastern Europe (Bellis et al. 2014a). Women were more likely to report being exposed to violence between parents or caregivers than men. This difference was also found in other countries, which may result from the fact that women and men define violence in slightly different ways (WHO, 2013). The lower proportion of those witnessing domestic violence could be due to underreporting. According to the National Survey of Child and Youth Victimization in Poland (Włodarczyk & Makaruk, 2013), 12% of teenagers (11–17 years old) had witnessed violence between caregivers in their lives. In addition, the survey carried out by the Public Opinion Research Center in 2012 revealed that 11% of respondents who were in an intimate relationship experienced violence at least once from their partner and 11% of respondents admitted to having been a perpetrator of domestic violence. Moreover, 28% of Poles reported that they personally or by sight knew a woman who had been physically abused by her husband (CBOS, 2012).

Alcohol was widely used by the students; 74.95% of respondents had had their first alcoholic drink before the age of 18 years. Over a third (38.97%) of the students had used psychoactive drugs. The most common (24.03%) street drug was marijuana. Roughly one in three (31.47%) respondents reported that they had smoked at least 100 cigarettes in their lifetime, and 5.5% had started smoking by the age of 15 years or younger. These problems were diagnosed also in the latest Health Behaviour in School-aged Children (HBSC, 2016) survey, which showed that 43% of Polish adolescents aged 11–15 years drink alcohol, including 6.4% who drink it at least once a week, every second teenager (48%) has already smoked a cigarette and one in four (24%) teenagers has used marijuana or hashish. According to research conducted among teenagers in Poland, the prevalence of alcohol and cigarette smoking has declined slightly while the prevalence of marijuana use has increased (Ostaszewski, 2017). The study showed that approximately every eighth respondent (12.33%) had his or her first sexual intercourse before the age of 16 years, but according to the HBSC survey, 17% of 15 year olds had already initiated sexual activity (HSBC, 2014).

The findings of our study are consistent with evidence from other studies about the incremental association between ACEs and health-harming behaviours (Bellis et al. 2014a). Of note, our study found a particularly strong association between ACEs and mental health problems, such as self-destructive behaviours:

suicide attempts (OR=17.42, four or more types of ACEs) and self-harm (OR=11.68, four or more types of ACEs). There was a strong association between emotional abuse (suicide attempts OR=7.92 and self-harm OR=3.85) and emotional neglect during childhood (suicide attempts OR=10.77 and self-harm OR=3.92). High odds ratios were also reported by other countries for suicide attempts among victims who had been exposed to four or more types of ACEs in the Russian Federation (Kaecheva, 2014), Montenegro (WHO, 2013) and Serbia (Paunovic et al. 2015). There was also a strong relationship between sexual abuse and having more than three sexual partners (OR=6.27). Previous studies had found that child sexual abuse may lead to having relatively large numbers of sexual partners (Merrill et al. 2003; Włodarczyk, 2016).

Adverse childhood experiences also significantly increase individuals' risks of early smoking (OR=4.45, four or more types of ACEs) and psychoactive drug abuse (OR=3.68, four or more types of ACEs). Analyses conducted in other countries also showed that victims of abuse had a higher risk of drug use (Turkey, Montenegro, Russian Federation and Serbia) and smoking (Albania and Montenegro) (Bellis et al. 2014a). The risk of self-perception as an alcoholic is nearly three times higher (AOR = 2.93) among those who had undergone four or more types of ACEs compared to those who had never had an ACE. These health-harming behaviours are strong risk factors for the development of NCDs and could impact in later life with disease and disability, and early death (Hughes et al. 2017; Bellis et al. 2014a). NCDs are recognized as a major cause of disability and premature death in Europe. Acting early in the life-course, including through the prevention of ACEs, would reduce the societal and health systems burden of NCDs (Resolution EUR/RC66/11). Our findings also demonstrate that ACEs are linked to mental health problems and addictions. From the alarming data on the prevalence of mental illnesses in Poland (Szredzinska, 2017), it appears that preventing ACEs is crucially important.

IMPLICATIONS FOR POLICY ACTION

The policy priority to stop violence against children is present in the Sustainable Development Goals (SDGs) target 16.2 of the 2030 Agenda for Sustainable Development – adopted by world leaders in September 2015 at an historic United Nations Summit. The aim of the action plan on “Investing in children: the European child maltreatment prevention action plan 2015–2020” is to prevent child maltreatment in whatever form, whether sexual, physical or mental abuse, or neglect. The present survey in Poland goes towards fulfilling one of the objectives of the action plan, namely, by making the problem of child maltreatment more visible.

Despite its retrospective nature, our study has shown that child maltreatment and other ACEs are common, as reported by young adults with an average age of 20 years. The results also confirm that ACEs are strongly associated with health-harming behaviours that have far-reaching mental and physical health consequences. They are also associated with the development of NCDs and mental ill-health, as well as an increased propensity for being a victim or a perpetrator of violence (Hughes et al. 2017). There has been recent concern about the mental health of children and young adults in Poland (Szredzińska, 2017), and NCDs are also a health priority in the country.

Our study indicates that ACEs especially increase individuals’ risks of problems associated with health-harming behaviours, such as smoking, alcohol and drug misuse, underage sex and self-harm, including attempted suicide. A large proportion of respondents also reported missing work and/or school due to stress, depression and loneliness associated with mental ill-health, which would also impact on whether victims achieve their full educational and developmental potential. Thus, preventing ACEs can reduce mental and physical ill-health and the costs connected with them.

The study highlights the relationship between the occurrence of the ACEs and health. It indicates the need for the following:

1. Evidence-based **prevention programmes** targeted at children and families at risk, as those with household dysfunction need support to provide warm, nurturing and safe environments for children so that they can reach their full developmental potential.

There is a strong evidence base of cost-effective interventions for prevention (Sethi et al. 2013; WHO, 2016). These include positive parenting programmes, safe environments and schools for children, pre-school education, home visitation by nurses and midwives to provide parenting support (Hardcastle et al. 2015). Programmes need to be implemented more widely by different actors from across the various sectors using a coordinated approach. This would be best delivered through the development of an intersectoral national action plan or policy (Gray et al. 2016). This would be in keeping with the European Child Maltreatment Prevention Action Plan, 2015–2020 (WHO, 2014b).

Special attention should be paid to the protection of the broad mental health of children and adolescents; to strengthen the factors that protect the mental

well-being of the child in the family, educational and care institutions, and the local community.

2. **Health systems** capacity-building should be undertaken to detect and provide support to families at risk, as health-care professionals are the first ones to have access to families with children. There is a special need to increase the engagement of the health-care sector in universal prevention services, ensure fuller realization of legal provisions, increase health-care professionals' engagement in identifying the risks of child abuse and subsequent intervention activities, and promote protective factors. The forthcoming WHO guidelines on responding to child abuse and neglect will provide the evidence base for how services can best respond and would be valuable in the Polish context.
3. **Social marketing** should be conducted to change parental attitudes towards corporal punishment, and existing laws should be better enforced.
4. **Awareness should be raised** so that suspected crimes against children are reported to law enforcement bodies by providing training for professionals, as well as education programmes and campaigns targeted at the general public. Such efforts are especially needed with regard to crimes committed within the circle of family and friends.
5. Intermittent **surveys** should be conducted to track the trends related to the phenomenon of child and adolescent abuse, and evaluate prevention actions. The scale of child abuse in Poland should be carefully monitored and the available support services evaluated by improving and standardizing the methods of collecting official data on gender, age categories, types of abuse, place of residence, nationality, risk factors, etc. Regular nationwide social surveys should be conducted to be able to monitor trends and evaluate existing services, including the analysis of all cases of severe or lethal abuse.

LIMITATIONS OF THE STUDY

The sampling method used in our study ensures that the sample was representative of each of the five purposefully selected institutions of higher education. The five universities were selected to represent the diversity of higher education facilities in Poland, so the findings are not representative of the overall population of young people in Poland and cannot be generalized to this population. Even though the sample does not show the exact scale of the problem in Poland, it helps to understand the relationships between ACEs and health-harming behaviours, which was the main aim of the study. Our study analysed the association between ACEs and health-harming behaviours, but not the causality.

The survey was conducted among students, i.e. young people who had graduated from high school and were able and willing to continue their education. Thus, the respondents could be expected to belong to households with a higher socioeconomic status (Herbst & Sobotka, 2016). This implies that the prevalence of ACEs and health-harming behaviours is likely to be even higher in the general population, as child maltreatment and other ACEs are socioeconomically determined (Sethi, 2013; Bellis et al. 2014a; Butchart, 2004; WHO/ISPCAN, 2006).

The self-reporting format of the study carried the risk that the respondents may have not disclosed some of their experiences while answering particularly sensitive questions. Moreover, the response rates for some questions suggest that the students were reluctant to disclose both their experiences from childhood and their health-harming behaviours. As the latter were also self-reported, it should be noted that the findings may not reflect their actual behaviours. The highest rates of missing data occurred for questions concerning the number of sexual partners (6.1%), age at sexual initiation (5.8%) and one of the forms of child sexual abuse, i.e. touching the body of an adult or someone at least five years older in a sexual way (8.3%).

Given the fact that most questions asked about events that had happened in the respondents' childhood, there was also a risk related to the limitations of human memory. Some experiences or their characteristics may have been lost or distorted due to recall bias.

Finally, some respondents may have not regarded certain events in their childhood as abusive and, consequently, may have failed to report them while answering the questions.

To minimize the risks mentioned above, the study was very carefully planned so as to maximize the comfort of respondents (see Methodology).

Given the methodological differences in the creation of some ACE measures in the surveys conducted in other countries, a comparison of results should be treated with caution.

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ANNEX: TABLES

Table 1. The indicators of adverse childhood experiences

	During your first 18 years of life	Accepted as positive
Physical abuse	Did your parent, stepparent, or adult living in your home...	
	Actually push, grab, shove, slap, or throw something at you?	Rarely, sometimes, often, very often
	or	
	Hit you so hard that you had marks or were injured?	Rarely, sometimes, often, very often
	or	
Sexual abuse	How often were you spanked?	A few times a year; many times a year; weekly or more
	Did an adult or someone at least five years older than you...	
	Touch or fondle your body in a sexual way?	Yes
	or	
	Have you touch their body in a sexual way?	Yes
	or	
	Attempt to have any type of sexual intercourse (oral, anal or vaginal) with you?	Yes
	or	
Emotional abuse	Actually have any type of sexual intercourse (oral, anal or vaginal) with you?	Yes
	A respondent who answered yes to any of the questions was considered positive for this adverse experience if they were reporting any sexual experiences that occurred before they were 15 years of age or non-consensual experiences that occurred before they were 18 years of age.	
	People in your family called you things like "lazy" or "ugly".	Sometimes, often, very often
	or	
	People in your family said hurtful or insulting things to you.	Sometimes, often, very often
	or	

	During your first 18 years of life	Accepted as positive
Emotional abuse (contd)	You believe you were emotionally abused.	Sometimes, often, very often
	or	
	Did your parent, stepparent, or adult living in your home...	
	Swear at you, insult you, or put you down?	Sometimes, often, very often
	or	
Emotional neglect	Act in a way that made you afraid that you might be physically hurt?	Sometimes, often, very often
	There was someone in your family who helped you feel important or special.	Never, rarely
	or	
	You thought your parents wished you had never been born.	Sometimes, often, very often
	or	
	People in your family looked out for each other.	Never, rarely
	or	
	You felt that someone in your family hated you.	Sometimes, often, very often
	or	
	People in your family felt close to each other.	Never, rarely
	or	
	Your family was a source of strength and support.	Never, rarely
	or	
	You felt loved.	Never, rarely
Physical neglect	You were hungry and you didn't have enough to eat.	Sometimes, often, very often
	or	
	You knew there was someone to take care of you and protect you.	Never, rarely
	or	
	Your parents were too drunk or high to take care of the family.	Sometimes, often, very often
	or	

Table 1. The indicators of adverse childhood experiences (contd)

	During your first 18 years of life	Accepted as positive
Physical neglect (contd)	You had to wear dirty clothes.	Sometimes, often, very often
	or	
	There was someone to take you to the doctor if you needed it.	Never, rarely
Witnessed domestic violence	Did your father/caregiver do any of these things to the other parent/caregiver...	
	Push, grab, slap or throw something at them?	Sometimes, often, very often
	or	
	Kick, bite, hit them with a fist, or hit them with something hard?	Sometimes, often, very often
	or	
	Repeatedly hit them over at least a few minutes?	Sometimes, often, very often
	or	
	Threaten them with a knife or gun, or use a knife or gun to hurt them?	Sometimes, often, very often
Parental divorce or separation	Were your parents ever separated or divorced?	Yes
Household crime	Did anyone in your household ever go to prison?	Yes
	or	
	Did anyone in your household ever commit a serious crime?	Yes
Household alcohol misuse	Did you live with anyone who was a problem drinker or alcoholic?	Yes
Household street drugs misuse	Did you live with anyone who used street drugs?	Yes
Household mental illness	Did anyone in your household attempt to commit suicide?	Yes
	or	
	Was anyone in your household depressed or mentally ill?	Yes

Table 2. The indicators of health-harming behaviours

	Questions	Answers
Smoking	Have you smoked at least 100 cigarettes (5 packets) in your entire life?	Yes
Early smoking ≤15 years	How old were you when you began to smoke cigarettes fairly regularly?	≤15 years
Self-perception as an alcoholic	Have you ever thought that you drink too much?	Yes
	or	
	Have you ever considered yourself to be an alcoholic?	Yes
Hazardous drinking	During the past month, how many <i>days per week</i> did you drink any alcoholic beverage on average?	Female ≥14 drinks, male ≥28 drinks
	On the days that you drank, about how many <i>drinks per day</i> did you have on average?	
Psychoactive drug use	Have you ever used pharmaceuticals to get high?	Yes
	or	
	Have you ever used designer drugs?	Yes
	or	
	Have you ever used street drugs? (e.g. marijuana or hashish, Ecstasy, amphetamine)	Yes
Early sexual activity ≤16 years	How old were you the first time you had sexual intercourse?	≤16 years
Number of sexual partners >3	With how many different partners have you ever had sexual intercourse?	>3
Suicide attempts	Have you ever attempted to commit suicide?	Yes
Self-harm	Have you ever intentionally harmed yourself?	Yes
Running away from home	Did you ever run away from home for more than one day?	Yes

Table 2. The indicators of health-harming behaviours (contd)

	Questions	Answers
Low physical activity	During the past month, about how many days per week did you exercise for recreation or to keep in shape?	Lower physical activity than at least 2 times a week for 30–59 minutes
	During the past month, when you exercised for recreation or to keep in shape: how long did you usually exercise (minutes)?	
Absence from work/school due to stress or feeling depressed	How many days of work or school did you miss in the past 30 days due to stress or feeling depressed?	≥1 day
Absence from work/school due to poor physical health	How many days of work or school did you miss in the past 30 days due to poor physical health?	≥2 days
Lack of close friends/ supportive relatives	How many close friends or relatives would help you with your emotional problems or feelings if you needed it?	None

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