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Adverse childhood experiences survey among university students in Turkey

Study report-2013

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ADVERSE CHILDHOOD EXPERIENCES SURVEY AMONG UNIVERSITY STUDENTS IN TURKEY

STUDY REPORT-2013

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Abstract

Today, violence is a social problem affecting all age groups. It is very difficult to estimate the magnitude of violence including maltreatment of children. Official figures are considered to be merely the tip of the iceberg. This study on adverse childhood experiences (ACEs) was conducted in 2 257 university students in order to provide evidence-based data about the magnitude of this problem in Turkey. Another aim of the study was to examine relationship between exposure to ACE and health risk behaviours and selected health consequences. The results show a high prevalence of physical, emotional, and sexual abuse beside emotional and physical neglect. The prevalence of household dysfunction was also assessed. Overall, 49.7% of respondent reported exposure to at least one type of ACE. ACE score was positively associated with health risk behaviours of respondents. The risk of smoking, harmful alcohol using and drug using increases dependently on the ACE score. Some health problems, and in particular emotional problems, were associated with ACE score of the participants. Respondents with a history of ACEs were more likely to have family, school, or financial problems. The results of this study will contribute to identify priority areas in need of interventions in Turkey.

Keywords
Accident and injury prevention
Child abuse
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Acronyms

ACE	Adverse Childhood Experience
AOR	Adjusted Odds Ratio
WHO	World Health Organization
CDC	United States Centers for Disease Control and Prevention
UN	United Nations
SD	Standard Deviation
N	Number of Participants
CI	Confidence Interval

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Executive Summary

Aims

This survey was conducted in order to identify the prevalence of ACEs (including child maltreatment and household dysfunction) in a selected group of university students in Turkey and to examine the association between the experience of ACEs, health risk behaviours, and some specific health consequences.

Methods

The survey is a descriptive cross-sectional study. The ACE Questionnaire developed by the United States Center for Disease Control and Prevention and Kaiser Permanente in 1997 was adapted and used as the survey questionnaire. The survey was implemented in 2012–2013 and covered 2 257 students of five universities from five different regions of Turkey.

The questionnaire includes 53 questions on sociodemographic characteristics, household dysfunction, childhood maltreatment, health risk behaviours, somatic complaints, and health status. At the beginning of each question category respondents were reminded that the questions are about experiences during the first 18 years of life.

Results

Almost half of the 2 257 respondents were male and 52.1% were female. The mean age of respondents was 20.1 years. Almost all the respondents were single and 41.7% were living with their families. In total, 95% of the respondents had at least one sibling and the average number of siblings was 2.6. The prevalence of respondents who were in the care of a parent or relative at preschool age was 92.4%.

The overall prevalence of childhood physical abuse was 21.1%. The prevalence was significantly higher among male respondents (26.2%) than females (16.3%). Overall, the prevalence of childhood sexual abuse was 7.9%. The difference in the prevalence of childhood sexual abuse was not significant between male and female respondents. The perpetrator was somebody known to the child in two thirds of the cases. The prevalence of emotional abuse was 9.8% among all respondents. The difference in the prevalence of emotional abuse was not significant between male and female respondents. The overall prevalence of emotional neglect was 8.8% and its prevalence was significantly higher among men (11.3%) than women (6.5%). The overall prevalence of childhood physical neglect was 5.7% and its prevalence was higher among men. Overall, the prevalence of exposure to domestic violence was 18.4% and the prevalence was significantly higher among men (20.9%) than women (16.1%). The prevalence of divorced or separated parents was 5.2% among all participants. The overall prevalence of depression or suicide attempt in the household was 9.3%. The prevalence of problem alcohol use in the household was 6.4%. Similarly, 3.4% of respondents reported a history of street drug use in the family. The prevalence of physical abuse was the highest of all ACEs, followed by exposure to domestic violence. Nearly one fifth of all respondents reported both physical abuse and exposure to domestic violence. The ACE scores indicate that half of all respondents had a history of at

least one ACE. Male respondents had higher exposure to ACEs both in number and type. The co-occurrence of different types of ACE was also significantly higher in males in almost all categories. On average, 33–50% of respondents were exposed to physical abuse and domestic violence, co-occurring with other ACE forms. ACE prevalence was significantly lower among respondents from nuclear families. The ACE score increased with the number of siblings. ACE prevalence was negatively associated with education status of parents.

Nearly 25% of respondents were smokers. The smoking prevalence was significantly higher among individuals with a history of ACE. The prevalence increased together with the increase in the number of ACEs. The risk of smoking increased by 1.54–3.69 times depending on the ACE score. Respondents with an ACE history have also a significantly higher prevalence of alcohol use and harmful alcohol use. The risk of drug use increased by 2.83–9.69 times with having experienced ACE.

The prevalence of emotional problems increased together with the increase in the number of ACE categories. The prevalence of crying spells, depression, uncontrolled anger, high stress level, nervousness and trouble refusing requests increased together with the increase in the number of ACE categories. Parallel to this, the risk of prevalence of emotional problems increased by 6–8 times.

The prevalence of respondents with a history of ACEs who reported family-related problems was significantly high. The risk of prevalence increases by 2.66–29.10 times depending on the increase in the number of ACE categories. Similarly, respondents with a history of ACEs were more likely to have problems at school.

Conclusion

The findings show a high prevalence of ACEs in this population of university students in Turkey. Health risk behaviours are more common among individuals with a history of ACEs. The prevalence of certain emotional and somatic problems was higher among respondents with a history of ACEs.

Almost half of the respondents reported at least one ACE. Physical abuse was the most common form of maltreatment in the study population. Physical abuse is followed by emotional abuse, emotional neglect and sexual abuse. The prevalence of physical neglect was the lowest.

Under household dysfunction, the most common problem was domestic violence followed by the presence of a household member imprisoned or involved in crime. Depression or suicide attempt in the household, harmful alcohol use in the household, separated parents, and a household member using street drugs were other frequent household dysfunctions.

The prevalence of physical abuse, emotional neglect, and physical neglect was higher among male respondents. There is no gender difference in the prevalence of sexual abuse and emotional abuse. However, the prevalence and the number of categories were higher

among males in general. ACE scores increased with the number of siblings and low parental education status.

This study suggests that ACE prevalence is high in this group of university students in Turkey and it is associated with a higher prevalence of health risk behaviours and some specific health and emotional problems. The findings are similar to those of other studies on child maltreatment, ACEs, and impacts. This study reconfirms information about the magnitude of the problem in Turkey and provides evidence that prevention is a priority for the country.

1. Introduction

Today, violence is ubiquitous and it has become a social problem affecting all age groups. Every year millions of people are killed, handicapped, and injured as a result of violence *(1)*. Violence against children indicates an unequal power relation in different forms including economic status, physical and mental status, gender roles, and cultural and religious traditions *(2)*.

The relationship between violence and children extends from encountering violence within the society or witnessing domestic violence, to direct exposure to violence as an individual. It is the responsibility of adults to protect children from violence and provide care, supervision and support as children are easily hurt, vulnerable and susceptible to external effects. Protection from violence is a fundamental right of every child. Therefore, a peaceful and healthy living environment which enables the child to maximize his or her potential and supports his or her development should be provided to fulfil children's physical and psychosocial needs for proper growth and development.

It is impossible to estimate the real magnitude of childmaltreatment. Abused children are often unable to voice their experiences, which are in turn rarely reported to the authorities. Official figures are considered to be merely the tip of the iceberg, as results from different studies show that the prevalence of child abuse is considerable *(1–6)*.

2. Conceptual definitions

The World Health Organization (WHO) defines violence as, "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation" *(1)*.

Maltreatment of children is considered broadly, covering all forms of physical and emotional ill-treatment, sexual abuse, neglect or negligent behaviour, and different forms of exploitation *(1,4,6–9)*. WHO provides the following conceptual definition of child maltreatment, "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" *(6,7)*.

In particular, the definition includes the prevalence, causes and consequences of four types of child maltreatment by caregivers, namely:

- physical abuse;
- sexual abuse;

- emotional and psychological abuse; and
- neglect.

2.1 Physical abuse

Physical abuse of a child is defined as the intentional use of physical force or implements against a child that results in, or has a high likelihood of resulting in harm for the child's health, survival, development, or dignity *(6,8)*. Physical abuse may manifest in different forms: violence can be inflicted upon a child by beating, shaking, pushing or by using an object or weapon. Physical abuse is often used as a mean of punishing the child and sometimes as a disciplinary method. Abusers are mostly individuals responsible for the development of the child such as parents, teachers and institutional staff.

2.2 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, for which is not developmentally prepared, or else that violates the laws or social taboos of society *(6)*. Contact is not absolutely necessary to define an act as sexual abuse but includes forcing the child to watch a sexual act or pornography, saying sexual words, or witnessing indecent exposure. Sexual abusers of children are predominantly adults who, by virtue of their age, have power, authority or responsibility over children. However, abusers sometimes include friends or peers who are in anticipation of a romantic relationship.

2.3 Emotional or psychological abuse

Emotional and psychological negligence and abuse involve a pattern of failure of a parent or caregiver to provide an appropriate and supportive environment *(6,7,10,11)*. All incidents of physical and sexual abuse involve emotional abuse. Some events, however, are limited to emotional abuse alone. Emotional abuse leaves no discernible physical trace, thus may be difficult to detect, but has a high probability of damaging cognitive, emotional, and social development in the long run *(6,7)*. This may lead to risk behaviours concerning health and is linked to the risk of illness and premature death *(12–15)*.

2.4 Neglect

Child neglect is the deficit of a parent or any person responsible for the care of the child in providing for the development and wellbeing of the child, and in meeting the child's basic needs such as nutrition, clothing, housing, safe living, education, healthcare, and love. Neglect may be intentional or unintentional *(6,8)*, and may occur in the home or institutions*(16,17)*. It is difficult to recognize neglect at early stages as its effects manifest in the long term. Yet, neglect has an adverse effect on the physical, mental and emotional development, and health status of children, and it can even lead to serious consequences including death *(18–22)*.

Acts of neglect may be divided into the following different categories *(7,16,17)*:

- ***Physical neglect*** is the failure to provide the child with basic necessities such as nutrition, housing, clothing, and cleaning. This may also include the neglect of the safety of the child. Physical neglect also involves abandonment and coercion for street-working or begging.
- ***Emotional neglect*** is the failure to provide emotional support to the child by maximizing his development, keeping with his potential.
- ***Medical neglect*** is when caregivers do not meet the healthcare needs of the child in a timely manner, observe medical recommendations, provide examination and treatment, get physician prescriptions, or discontinue recommended treatment.
- ***Educational neglect*** is when the child is deprived of education and learning appropriate for his age, interests and abilities, and is not provided with educational support.
- ***Neglect of social support*** is the negligence of social institutions and organizations and failure on their part to offer adequate or effective services to meet the social needs of children.

2.5 Household dysfunctions

Domestic problems or household dysfunction affect children's health and development.Household dysfunction includes domestic violence, separated families, having a family member who has a psychiatric disorder, alcohol or drug misuse, or being imprisoned. One of the most common problems is witnessing domestic violence, and children have experiences that can be as distressful as directly experiencing abuse or neglect *(10)*. Exposure to such violence is associated with developing strong feelings of abandonment, deceit, and betrayal by parents or caregivers, especially in young children.

These negative factors in living conditions increase the risk of both maltreatment and health risk behaviours and problems for the children *(22–31)*.

3. Magnitude of the problem

Studies suggest that violence against children is a major public health concern around the world *(1,4–7,32)*. Various international studies indicate that 25–50% of all children have suffered serious and frequently repeated violence, although the rates may vary across countries *(6,33)*.

Turkey lacks nationally representative studies which might provide a clear indication of the magnitude of child abuse and neglect in the country. The available small-scale studies suggest that the dimensions of the problem are alarming and that it requires urgent study and intervention.

According to a literature review of several studies in Turkey, the prevalence of physical abuse varies from 15% to 75% and the prevalence of sexual abuse is approximately 20% *(34)*. Studies of different centres over the past decade estimate physical abuse of children at 13–48%, emotional abuse of children at 36–60%, and sexual abuse of children at 10–28% *(35–39)*. A study from 2013 found that among the children presenting to a hospital, educational and medical neglect was found in every three out of four children, neglect of social support in half of the children, nutritional neglect in one out of four children, and emotional neglect and neglect of developmental support in one out of four children *(17)*. Furthermore, a multicentred survey of child protection units in Turkey between 2001 and 2006 estimated the prevalence of neglect at 20% *(40)*.

4. Legal framework for protecting children's rights in Turkey

The United Nations Convention on the Rights of the Child (UNCRC) covers the rights of individuals under 18 years of age. The Convention and its optional protocols set out the highest standards of protection and support to children that an international instrument can provide. According to Article 19 of UNCRC, violence involves all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, maltreatment, and sexual abuse. This definition covers domestic violence or violence against children elsewhere. The UN Convention on the Rights of the Child was signed by Turkey in 1990 and ratified by the Parliament , thus becoming part of the domestic legislation in 1995 *(2)*.

Various articles of the Constitution of the Republic of Turkey *(41)* and the Turkish Civil Code *(42)* safeguard the protection of children from ill-treatment and support for their growth and development. In addition, the Child Protection Law was adopted in 2005 *(43)*. The Law is an important step for child advocacy and security as it establishes the procedures and principles of the protection of vulnerable children and safeguarding their rights and wellbeing. The Law lays down measures concerning children in need of protection, security measures applicable to juvenile delinquents and provisions on the establishment, and duties and powers of the juvenile courts.

In addition, the Turkish Criminal Code includes provisions related to child maltreatment *(44)*. Article 103 of the Code includes provisions on child sexual abuse. Other sexual offenses against children are defined in Articles 102, 104 and 105. Other offenses related to child maltreatment are defined in Article 232.

5. The consequences of child maltreatment

Adverse and violent experiences, particularly during childhood, have severe and sustained effects *(12,19,20)*. A child is definitely affected by ill-treatment regardless of the form or intensity. It impairs the child's physical and mental health and affects his or her risk behaviours, resulting in different adverse outcomes. The gravity and permanence of the effect depend on various factors. First and foremost are the developmental stage (age) of the child at the time of abuse, severity of abuse, the relationship of the perpetrator with the child and the duration of violence. The effects of violence on the child are determined by the characteristics of the living environment of the child and his or her relationship with parents and other family members *(7,45,46)*.The effects of violence on the child may also manifest along the life course, as medical, emotional, psychiatric and social problems later in adulthood. The data from studies on the effects of negative childhood experiences and child maltreatment at later stages of life exhibit the gravity of the matter *(3,6,7,12-16,21,46–56)*.

5.1 Physical health consequences

The health consequences of violence against children include bruises, cuts, contusions, abrasions, bone fractures, internal organ injuries, cerebral haemorrhage, restless legs and arms, and sensory disorders such as loss of sight, loss of hearing and speech disorders (Box 1.1) *(3,5,7,57–59).* Violence can lead to permanent disability and death, depending on the severity.

The most significant physical consequences of physical abuse of children include loss of life, organ damage and associated disabilities. A major outcome of physical abuse is mental retardation. Mental retardation may also occur as a result of head injuries cranial haemorrhages and damaged nerve cells. Infants and young children are affected more from physical violence and they are more susceptible to fatal abuse. An examination of the cases of death attributable to violence suggests that infants and very young children are the most vulnerable. Rates for 0–4 age group are more than double those of the 5–14 age group *(6)*.

Box 1.1. Physical Health Consequences

- Abdominal/thoracic injuries
- Brain injuries
- Bruises and welts
- Burns and scalds
- Central nervous system injuries
- Disability
- Fractures
- Lacerations and abrasions
- Sensory disorders

Part of the injuries related to violence against children may not cause permanent physical damage but they are known to lead to various serious somatic complaints at adult age *(6,12–15,21,46,49,52,55,59–62)* (Box 1.2). The results of the meta-analysis by Paras et al. covering 23 studies between 1980 and 2008 on child sexual abuse cases suggest a significant correlation between history of sexual abuse and lifelong functional gastrointestinal disorders, nonspecific chronic pain, psychogenic non-epileptic seizures and chronic pelvic

pain *(60).* Psychiatric symptoms include depression, anger and anxiety, and somatic-physical complaints such as chronic pain, fibromyalgia, functional gastrointestinal system disorders and headache *(7,49,61)*.

Box 1.2. Other Longer-term Health Consequences

- Cancer
- Fibromyalgia
- Gastrointestinal diseases such as Irritable bowel syndrome and peptic ulcer
- Ischaemic heart diseases
- Liver disease
- Reproductive health problems such as infertility
- Allergy
- Astma
- Arthritis/rheumatism
- Respiratory diseases
- High blood pressure
- Type II Diabetes Mellitus
- Obesity
- Migraine,
- Autoimmune diseases

5.2 Sexual and reproductive health consequences

Sexually abused children are at risk of unwanted pregnancy and sexually transmitted diseases although physical findings are infrequent *(3,7,49,56,63)*. The prevalence of reproductive health problems and sexual dysfunction is high among the victims in the long run *(63)*. Child victims try to cope with the traumatic experience in different ways. This may involve inflicting self-harm. The former victims develop problematic sexual behaviours and may have sexual relationships with many people. This increases the risk of exposure to sexually transmitted diseases and sexual abuse by different people. The latter group on the other hand, develop a negative attitude to sexuality. Sexual inhibition on their part may cause problems in their relationships *(7,63)* (Box 1.3).

Box 1.3. Sexual and Reproductive Health Consequences

- Reproductive health problems
- Sexual dysfunctions
- Sexually transmitted diseases, including HIV/AIDS
- Unwanted pregnancy

5.3 Psychological and behavioural consequences

The mood and psychosocial development of the abused child deteriorates starting from early ages *(22,64)*. The impact is sustained in later years *(7,47,54)*. Part of the psychological problems or behavioural changes can be so severe that a child may have to seek medical assistance at early stages while another part of them may be invisible or slight. However, this is not a predictor of how and to what extent the trauma might affect the future life of the child. The most frequent problems associated with child maltreatment at early ages consist of depression, increased anxiety, tantrums, feelings of shame and cognitive disorders. The manifestation of these problems may result in failure in relationships with friends and family members and low success in education. At later stages, problems such as post-traumatic stress disorder, major depression, anxiety disorders, suicidal thoughts and attempts, and risk-taking behaviours like use of alcohol, drugs, and smoking *(3,7,12,14,15,23,47–51,53,56,59,66)* (Box 1.4).

A meta-analysis by Gershoff et al. suggests that parental corporal punishment at childhood results in increased aggression, delinquency; decreased cognitive capacity and higher likelihood of violent behaviour towards children and spouse in adulthood (*66*).

5.4 Neurobiological consequences of stress and abuse in early childhood

The first 3–6 years of life when the nervous system development is most evident are very important in view of adverse experiences. Childhood stress causes a number of changes in the brain in this period of life when both nerve cells and intercellular connections develop and protective factors reinforcing these connections are formed. The hypothalamic-pituitary-adrenal axis becomes impaired and the body's system for responding to stress is affected *(19,20,64,67,68)*. Impaired stress responses cause structural and functional changes in other regions of the nervous system and lead to diseases by triggering physiopathological mechanisms which underlie several diseases *(6,16,19,20,67–69)*.

Box 1.4. Psychological and Behavioural Consequences

- Alcohol and drug abuse
- Smoking
- Cognitive impairment
- Delinquent, violent and other risk-taking behaviours
- Depression and anxiety
- Developmental delays
- Eating and sleep disorders
- Feelings of shame and guilt
- Hyperactivity
- Poor relationships
- Poor school performance
- Poor self-esteem
- Post-traumatic stress disorder
- Psychosomatic disorders
- Suicidal behaviour and self-harm
- Criminal behaviour

5.5 Health consequences of household dysfunctions

Domestic violence may have multiple components. Children especially at an early age feel strongly neglected, deceived and betrayed by the parents or caregivers when they live in a violent household environment. This may prevent or decrease the usage of natural protective mechanisms in the developmental process of children *(70)*.

Some of the children witnessing domestic violence especially in early ages may also encounter physical violence *(30)*. Even in the absence of such direct violence, witnessing violence may result in aggressive behaviours, passiveness, withdrawal, somatic symptoms, anxiety, and suicide attempts *(31)*. Parental separation or divorce may affect the development of children negatively. Living with a single parent may increase attachment problems with the parent, which, in turn, may pose the risk of other maltreatment experiences *(21,71–73).*

Living with family members who have alcohol or drug problems increases the risks of witnessing domestic violence and maltreatment *(22,23,27,50,74,75)*. Stress in the family

increases with the existence of family members with psychiatric problems or who attempt or commit suicide. There are studies showing relation between maternal depression and behavioural problems in children *(25)*. Presence of psychiatric disorders or suicide in the family increases the risk of adverse life events for children via increased familial stress *(24,28)*.

Exposure to and acceptance of criminal and illegal acts by peers and carers is an important risk factor for children being involved in criminal acts, and negatively influences their emotional and social development increasing their predisposition for health risk behaviours *(22,26,29,76)*.

5.6 The impact of multiple forms of abuse

ACEs, whether due to child maltreatment or household dysfunction, will negatively affect children's development and health. The Adverse Childhood Experiences study (1998) is the first comprehensive study on the relationship between ACEs and adult health status *(12)*. The study, covering nearly 13 500 adults suggested a linkage between ACEs, somatic complaints, and various health problems. The study found that respondents who were subjected to more than one form of childhood adverse experiences had a higher likelihood of experiencing health risk behaviours and health problems in adulthood, leading to premature death *(13,16)*.

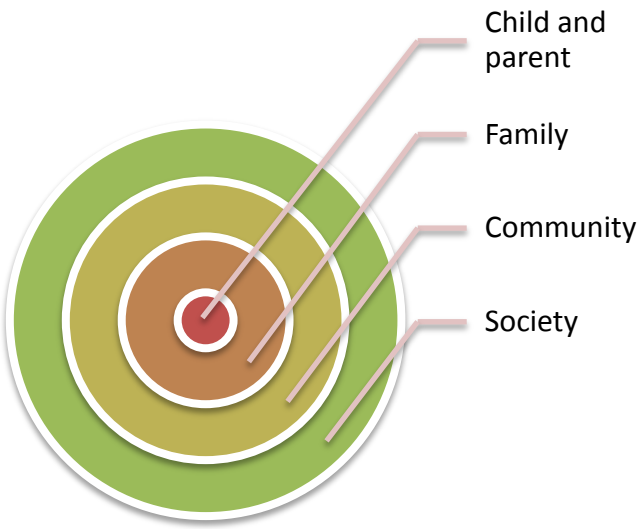
The impact of childhood adverse experiences on adult life was studied in later years by Brown DW. et al., Ramiro LS. et al., Ford ES. et al., Bellis MA. et al., Baban A. et al., Qirjako G. et al., Ravela M. et al. and Strine TW et al. on different groups and these studies found similar results *(13–15,49,51,77–79)*.

6. Risk and protective factors for child maltreatment

6.1 Susceptibility and risk factors

Child maltreatment occurs as a consequence of a multitude of factors and it is best to understand the interplay of these by using the ecological model shown in Fig. 6.1. In this model the various factors are thought to interact and result in violence through interactions at four levels: the individual (child and parent), the relationship (family), the community, and the society *(1,3,4,6)*.

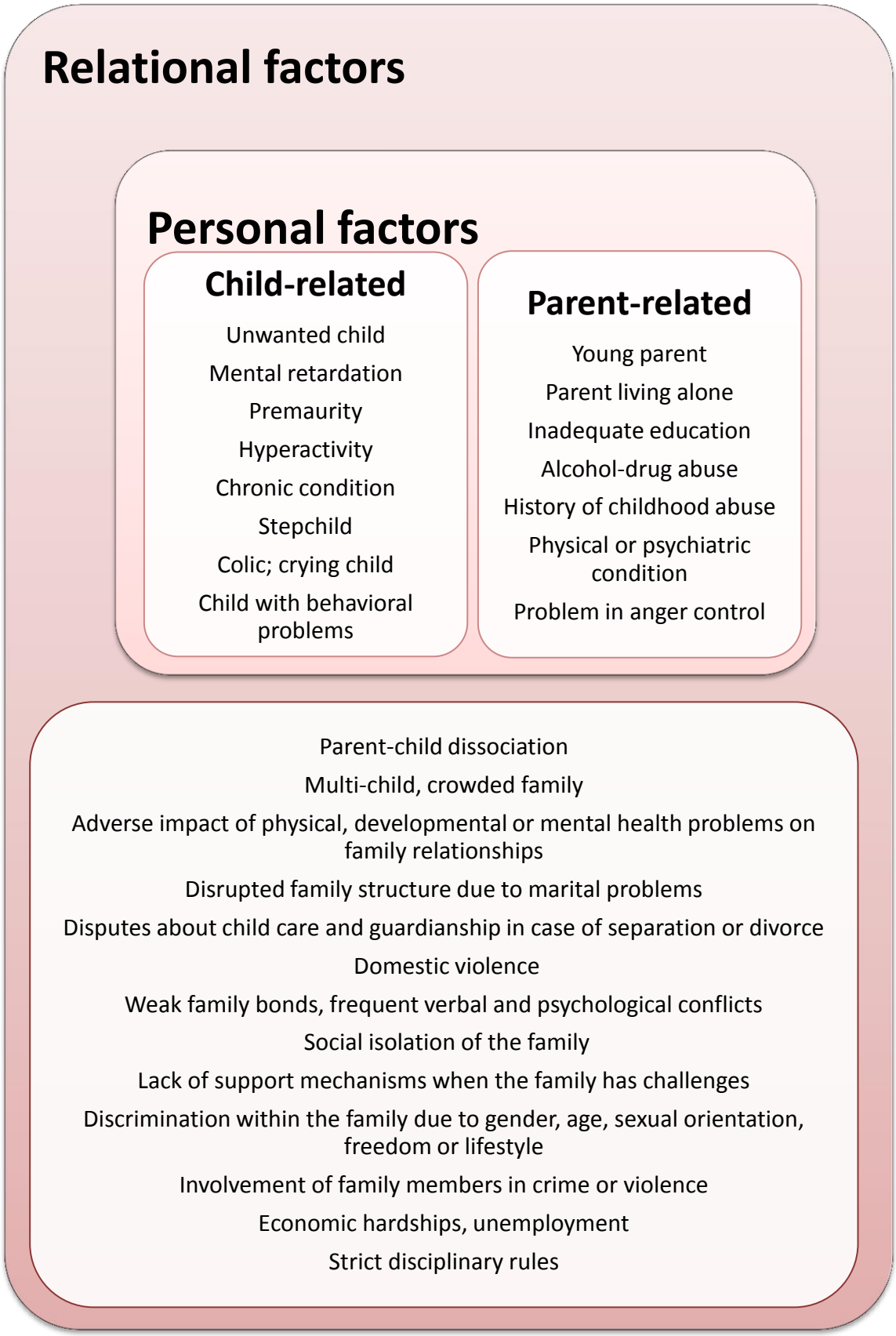
Fig. 6.1. Hierarchical structure of risk factors of child abuse and neglect



6.1.1 Risk Factors related to the child, parent and family

At the individual level, personal history and biological factors influence the likelihood of being a perpetrator or victim of violence. The risk factors concerning the child himself or herself include conduct disorders or having a disability *(3,4,6)*. Perpetration is more likely to occur by a carer who may be a young, single parent with an insufficient knowledge of parenthood, if there is an underlying psychiatric, drug or alcohol problem, or if they have been abused themselves *(3,4,6,18,24,25)*. However, the assessment of these factors should not disregard interpersonal relationships. At the relationship level, risk factors for maltreatment include problems in mother-baby bonding, poor parenting behaviours, domestic violence, family conflict, and low socioeconomic status with social isolation are risk factors for maltreatment (Fig. 6.2).

Fig. 6.2. Risk factors related to the child and the family for abuse and neglect (adapted from reference 3)



6.1.2 Risk factors related to the living environment or community of the child and the society

Certain characteristics at community level or living environment of the child may pose a risk for abuse and neglect *(3,5,6,16,18,80–82)*. These include socioeconomic disadvantage, the free availability of alcohol and drugs, poverty affecting large segments of the society, and discrimination against various social groups. The social acceptance of violence and corporal punishement, cultural norms that undervalue children, social acceptance of child marriages, and weak legislation preventing child abuse are also risk factors for child maltreatment. The risks related to the living environment of the child and societal risks may sometimes overlap. The ecological model is also of importance in the development and implementation of prevention programmes that target factors interplaying at different levels.

6.2 Protective factors

Protective factors can help protect the child from maltreatment and mitigate the adverse impact of abuse on the child *(6,71,83–86)*. These factors include:

- secure attachment of the child to parents;
- positive, supportive and warm relationship of parents to the child;
- proper parental care and attention;
- keeping away from delinquent or drug-abusing friends;
- self-confidence of the child; and
- lack of parental support for corporal punishment.

7. Aim and objectives of this survey

This survey was conducted in order to identify the prevalence of ACEs in a group of university students in Turkey, and to examine the association between the history of ACEs and health risk behaviours and certain health consequences.

Using the methodology recommended by WHO/CDC, the survey sought a history of child maltreatment (physical abuse, sexual abuse, emotional abuse, neglect) and household dysfunction (witnessing domestic violence, substance misuse and mental illness in family members, separated parents and imprisoned family member) *(6)*. Respondents were also asked about harmful alcohol or drug use and smoking in the category of health risk behaviours. Furthermore, respondents were asked about current health status and health conditions.

Specific objectives of the survey:

- to estimate the prevalence of childhood (first 18 years of life) ACEs by
    - estimating the prevalence of child maltreatment (physical abuse, sexual abuse, emotional abuse, emotional neglect and physical neglect);
    - estimating prevalence of household dysfunction (domestic violence, separated or divorced parents, depressed or suicidal household member, harmful alcohol use by household member, street drug use by household member and household member involved in crime or imprisoned);
- to estimate prevalence of health risk behaviours (smoking, harmful alcohol and drug use);
- to estimate the prevalence of specific health problems (psychiatric problems, gastrointestinal complaints, sleep disorders etc.);
- to explore the relationship between the presence of ACEs and health risk behaviours;
- to explore the relationship between ACEs and the presence of an certain adult somatic complaints; and
- to develop recommendations to contribute to the prevention of child maltreatment.

7.1 For whom is this research intended?

It is evident that child maltreatment is a major public health concern although the available data on its magnitude is mainly based on limited number of local studies. Besides that, what adds to the challenges in solving the problem is the lack of an adequate structure for the appropriate and effective approach to victimized children. Furthermore, the problems caused by child maltreatment are not limited to the childhood period. Individuals abused and neglected in childhood experience other related problems at adult ages. First and foremost, it is necessary to be aware of the magnitude, impacts and risk factors of the problem in order to eliminate all forms of violence against children and resolve associated problems. This survey is a step towards determining the weight and impact of the problem.

The data and information from the survey are expected to contribute to the development of local and national programs for preventing all forms of violence against children and contribute to the debate about developing a national child maltreatment prevention action plan and policy. In this regard, the results of the survey are intended to support policy makers and nongovernmental organizations in the development and implementation of violence prevention programs at local or national level.

8. Methodology

8.1 Study design

The survey was designed as a descriptive cross-sectional study using the methodology in "Preventing child maltreatment: a guide to taking action and generating evidence (WHO, 2006)" *(6)*. The questionnaire used in the survey was adapted from the Adverse Childhood Experiences (ACE) questionnaire. The survey was implemented in 2012–2013 in 2 257 students from five universities in five different regions of Turkey.

8.2 Research instruments

The questionnaire used in the survey was translated and adapted by the survey team from the ACE Questionnaire (http://www.cdc.gov/ace/index.htm) developed by the CDC and Kaiser Permanente in 1997.

The original questionnaire comprises the Family Health History and Physical Health Appraisal questionnaires, with two separate forms for women and men. In the adaptation of the questionnaire, however, various questions for women and men were removed for fear of low response rate due to cultural reasons, and the different questionnaires were combined in a single format for women and men. As the sample of the survey consisted of young adults, part of the questions in the Physical Health Appraisal Questionnaire, which concerned health conditions at advanced ages were removed, and the questions on somatic complaints were included. As the form was shortened, the Family Health History and Physical Health Appraisal questionnaires were combined to become a single form consisting of 53 questions. The adapted questionnaire was pre-tested on 100 university students and some of the questions were revised based on the feedback of participants.

The questionnaire includes questions on sociodemographic characteristics, household dysfunction, childhood maltreatment, health risk behaviours, somatic complaints, and health status (Annex 1). Respondents were reminded at the beginning of each question category that the questions are about experiences during the first 18 years of life:

- questions 1 through 15 are about sociodemographic characteristics;
- questions 16 through 30 are about household dysfunction;
- questions 31 through 37 are about childhood maltreatment; and
- questions 38 through 53 are about health risk behaviours and health status.

8.3 Remarks about the questions

The responses were evaluated in accordance with the scheme below in order to determine what form of violence the respondent experienced in childhood, and about their experience of household dysfunction. These different types of ACE categories were then used to test the associations with health risk behaviours and health outcomes.

1. Physical abuse	
Questions - *Sometimes children can be exposed to offending behaviours of their parents or other adults. Below please find some of these behaviours. Please by regarding the period before the age of 18,* select the most appropriate choice about being exposed to these behaviours …	***Accepted as positive***
• Hitting and throwing an object or hitting and threatening with throwing an object	Sometimes, Frequently, Very frequently
OR	
• Hustling or slapping	Sometimes, Frequently, Very frequently
OR	
• Hitting severely to leave a mark or to injure	Once or twice, Sometimes, Frequently, Very frequently
2. Sexual abuse	
Questions - *Before the age of 18, some people could have been forced to have sexual experience with a person who was at least 5 years older than them or who was an adult. This experience could have been had with a relative, a friend or a stranger. The below questions are about this subject; you are free to reject answering them if you do not want to answer.*	***Accepted as positive***
- Touch or caress your body sexually?	*Yes*
OR	
- Did you touch his/her body sexually?	Yes
OR	
- Attempt to have sexual intercourse with you? (Oral, vaginal, anal)	Yes
OR	
- Have any kind of sexual intercourse with you? (Oral, vaginal, anal)	Yes
3. Emotional abuse	
Questions - *By taking the period during which you were younger than 18 into consideration,*	***Accepted as positive***
• For me, my family members used adjectives that possess negative features like "ugly", "lazy", "dumb", and "clumsy"	Frequently true, Very frequently true
OR	

• I used to think that my parents wished that I had never been born	Frequently true, Very frequently true
OR	
• My family members said hurting and insulting words to me	Frequently true, Very frequently true
OR	
• Swearing or insulting	Frequently , Very frequently
4. Emotional neglect	
Questions - *By taking the period during which <u>you were younger than 18</u> into consideration,*	***Accepted as positive*** *Questions were reverse Scored (1=very frequently true, 5= never true) and responses summed. Positive if person scored 12 or more*
• I knew that there was someone who would take care of me	
• There was one person in my family who made me feel important or Special	
• I felt I was being loved	
• My family members cared for and supported each other	
5. Physical or medical neglect	
Questions - *By taking the period during which <u>you were younger than 18</u> into consideration…*	***Accepted as positive***
• We did not have enough food	Frequently true, Very frequently true
OR	
• I had to wear dirty clothes	Frequently true, Very frequently true
OR	
• There was someone who would take me to a doctor when I needed	Never, Rarely true, Sometimes true
6. Domestic violence	
Questions - Sometimes children can be exposed to offending behaviours of their parents or other adults. Below please find some of these behaviours. Please <u>by regarding the period before the age of 18,</u> select the most appropriate choice about being exposed to these behaviours…	***Accepted as positive***
• Hustling, slapping or throwing an object at him/her	Sometimes, Frequently, Very frequently

OR	
• Kicking, biting, punching or hitting with a hard object	Sometimes, Frequently, Very frequently
OR	
• Repeatedly hitting for a few minutes	Once or twice, Sometimes, Frequently, Very frequently
OR	
• Threatening with a knife or weapon, using a knife or weapon to injure him/her	Once or twice, Sometimes, Frequently, Very frequently
7. Parents separated or divorced	
Question	***Accepted as positive***
- Are your parents divorced or ever separated?	Yes
8. Depressed or suicidal household member	
Questions	***Accepted as positive***
- Does anyone in your family have mental disease?	Yes
OR	
- Has anyone in your family attempted to commit suicide?	Yes
9. Problem alcohol use by household member	
Question	***Accepted as positive***
- For a period of time, did you share the same house with a person who had alcohol problem or who was an alcoholic?	Yes
10. Street drug use by household member	
Question	***Accepted as positive***
- For a period of time, did you share the same house with a drug addict?	Yes
11. Household member involved in crime or imprisoned	
Questions	***Accepted as positive***
- Has anyone in your family imprisoned?	Yes
OR	
- Has anyone in your family involved in crime?	Yes

8.4 Pilot study

Before the survey, the translated and adapted questionnaire was pre-tested on 100 university students. Some of the questions were removed, some were revised, and the questionnaire was finalized after the pre-test. The data from the pre-test with 100 participants were not included in the evaluation.

Following the revision of the questionnaire, a pilot study was conducted among 1st and 2nd grade students of the Medical Faculty of Ankara University. A total number of 664 respondents were involved in the pilot study. Of these, 574 (86.4%) completed the questionnaire. After the analysis of the data of the pilot study, there was no need to revise the methodology or the questionnaire. This questionnaire was used in the actual field study. The data from the pilot study was included in the evaluation of the study.

8.5 Main study

The study was conducted between May 2012 and February 2013 on students from five universities in five different regions of Turkey. All the participating universities are public education institutions and are among the largest universities in their respective regions. Respondents were selected by random sampling.

The respondents were first informed about the survey, explained that involvement was voluntary, reassured that data would be stored anonymously, given the questionnaires and allowed to complete the forms in a private and calm setting.

Study regions, provinces and universities (Fig. 8.1);

- Central Anatolian region, Ankara, Ankara University (Pilot study centre)
- Black Sea region, Trabzon, Karadeniz Technical University
- Eastern Anatolian region, Van, Yüzüncü Yıl University
- Mediterranean region, Antalya, Akdeniz University
- Aegean region, Izmir, Ege University

Fig. 8.1. Study regions and provinces

8.6 Response rate

Initially, it was planned to enrol 2 600 students in the study in total. The number of students to be included from the universities was calculated in accordance with the size of each university and it was planned to enrol 300 to 520 students from each. However, the expected number was not reached in all centres. Table 8.1 shows the participant and response rates. Totally, 2 524 students were enrolled in the study. 267 students (10.6%) declined to take part in the study and were not considered further. Overall, 2 257 students from all selected universities completed the questionnaire.

Table 8.1. Description of students from participating universities who completed the questionnaire

Universities	Number of participants	Response rate Participating/targeted students (%)
Ankara University	574	574/664 (86.4)
Karadeniz Technical University	518	518/520 (99.6)
Yüzüncü Yıl University	498	498/520 (95.8)
Akdeniz University	473	473/520 (90.9)
Ege University	194	194/300 (64.7)
TOTAL	**2 257**	**2 257/2 524 (89.4)**

As a first step, the study was piloted in Ankara University. All 664 of 1st and 2nd grade medical faculty students were included in the study; however, 90 students declined and the responses of the remaining 574 were considered for evaluation.

The targeted number could not be reached in Ege University as the survey time collided with the midterm. In this university, 300 students were invited but only 194 (64.7%) agreed to take part in the study. The targeted number of 520 students in each of the other universities was reached. Of these, however, 95.8% in Yüzüncü Yıl University, 90.9% in Akdeniz University and 99.6% in Karadeniz Technical University agreed to respond.

Overall, 2 257 participants completed the questionnaire. However, some of the questions were not answered completely and some were left unanswered. In total, 1 749 respondents (77.5%) answered all the questions.

8.7 Ethical issues of the survey

The survey proposal was submitted to the approval of the Ethical Committee of the Medical Faculty of Ankara University before the piloting phase. The pilot study was implemented in Ankara University after the approval of the ethical committee. After the pilot, an application for a multi centred survey was filed with Akdeniz University, one of the selected universities, and the ethical approval was given by the Ethical Committee of the Medical Faculty of Akdeniz University.

The survey coordinators in the universities comprised staff members of each university and researchers in the survey team. The survey was implemented by these coordinators. Permission for university was obtained from the university/faculty deans to whom detailed information was provided. Students were given information about helpline in the unlikely event that the questionnaire resulted in emotional upset. The first page of the questionnaire includes an information note on the survey, the researchers, and the right of participants to decline. Before starting, all respondents were informed about the aim and objectives of the survey, how to complete the questionnaire, and asked to read the information note on the cover page. They were also given assurance that the data from the survey would be used exclusively for the purpose of scientific studies and kept anonymous.

8.8 Data analysis

Statistical Package for Social Sciences (SPSS, ver.17.0) software was used for data entry and statistical evaluation. Data was entered by four trained medical faculty students and data quality was verified using over 100 randomly selected questionnaires.
The following statistical methods were used for data analysis:

- descriptive statistical methods (average, standard deviation, percentages, difference test for average and proportion);
- correlation;
- chi-square analysis;

- logistic regression analysis was employed to adjust for the potential confounding effects of gender, age, maternal education status and paternal education status on the relationship between ACEs and health-risk behaviours; and
- the prevalence of ACEs and health-risk behaviours was determined. Estimates of odds ratio were computed to obtain a measure of association between ACEs and health-risk behaviours.

P values below 0.05 were considered statistically significant in all statistical analyses. Missing data were not statistically imputed.

At the data analysis stage, data from the responses of all participants to the questions on the prevalence of child maltreatment and household dysfunction were included in the evaluation as each question was independent from the other and a response did not affect the other responses. Thus, it was possible to evaluate the responses to other questions even if the participant failed to answer some of the questions in other areas.

However, questionnaires lacking response in even a single category were excluded as all categories have to be taken into consideration for ACE categorization. Therefore, analyses related to ACE categories, health risk behaviours and health status were performed based on 1 749 respondents who answered all the questions.

8.9 Administering the study

The study was administered by a team of 10 members including four paediatricians, one psychiatrist, two public health specialists, one sociologist, one medical statistical expert and one social worker in collaboration with staff from the WHO Regional Office and Country Office for Turkey.

9. Results

9.1 Sociodemographic and socioeconomic characteristics of respondents and families

Almost half of the 2 257 respondents were male and 52.1% were female. Table 9.1 shows the sex and age distribution of respondents. The mean age of respondents was 20.1 years. Older students were included as the sample selection was random. Only 5% of the respondents were aged 24 or older.

Table 9.1. Number (N) of respondents by sex, their mean age and distribution by age

Distribution by sex and age		
Male	N (%) Mean age± SD* (Min–Max)	1 082 (47.9) 20.3 ± 2.2 (18–41)
Female	N (%) Mean age± SD* (Min–Max)	1 175 (52.1) 19.9 ± 1.9 (18–34)
Total	N (%) Mean age± SD* (Min–Max)	2 257 (100.0) 20.1 ± 2.0 (18–41)
Age in years		**Number (%)**
18–19		979 (43.4)
20–21		886 (39.3)
22–23		278 (12.3)
24–25		68 (3.0)
26 +		46 (2.0)
Total		**2 257 (100.0)**

* Standard Deviation.

Table 9.2 shows the marital status, current place of residence, the family types and sibling numbers of the respondents. Almost all (98.8%) of the respondents were single and 41.7% were living with their families.

The majority of the respondents belonged to a nuclear family. Only 5.1% of respondents did not have a sibling; the average number of siblings was 2.6 ± 2.2. The prevalence of respondents who lived apart from their families during the first 18 years of life was 17.4%. The prevalence of respondents who were in the care of a parent or relative at preschool age was 92.4%.

Table 9.2. Marital status, place of residence, family types and sibling numbers of respondents

Marital status	Number (%)
Single	2 228 (98.8)
Married	18 (0.8)
Divorced	4 (0.2)
Widow/widower	5 (0.2)
Total[a]	**2 255 (100.0)**
Current place of residence	
Dormitory	762 (34.0)
In the house with family members	935 (41.7)
Alone or with friends in the house	492 (22.0)
Others	52 (2.3)
Total[b]	**2 241 (100.0)**
Family type	
Nuclear family	1 989 (88.8)
Extended family	215 (9.6)
Others	36 (1.6)
Total[c]	**2 240 (100.0)**
Number of siblings	
None	114 (5.1)
1	801 (35.7)
3	262 (11.6)
4	179 (8.0)
5 +	512 (22.8)
Total[d]	**2 243 (100.0)**

[a] Response rate for this question: 99.9% (2 255/2 257)

[b] Response rate for this question: 99.3% (2 241/2 257)

[c] Response rate for this question: 99.2% (2 240/2 257)

[d] Response rate for this question: 99.4% (2 243/2 257)

Table 9.3 shows the education status of the parents of the respondents. In the assessment of the level of education, "low" refers to "illiterate, literate" and "primary school graduates", "middle" means "high school graduate" and "high" is "university-college graduate".

Overall, the rate of mothers with low education level was higher than fathers' in the same category. The difference in the education level of mothers between male and female respondents was not statistically significant. However, the education level of the fathers of female respondents was higher than that of male respondents.

The unemployment rate of mothers was higher than the fathers (Table 9.3). Furthermore, the employment rate of both parents was higher among female respondents than that of male students and the difference was statistically significant ($P<0.05$ for mothers, $P<0.001$ for fathers).

Table 9.3. Distribution of respondents by the education status of parents and employment status of the parents of respondents

Parent's status		Sex of the respondents				Total	
		Male		Female			
Education status							
Mother		N	%	N	%	N	%
	Low	591	55.2	593	50.8	1184	52.9
	Middle	260	24.3	320	27.4	580	25.9
	High	219	20.5	255	21.8	474	21.2
	Total[a]	**1 070**	**100.0**	**1 168**	**100.0**	**2 238**	**100.0**
Father							
	Low	393	36.8	339	29.1	732	32.8
	Middle	319	29.8	428	36.8	747	33.5
	High	357	33.4	397	34.1	754	33.8
	Total[b]	**1 069**	**100.0**	**1 164**	**100.0**	**2 233**	**100.0**
Employment status							
Mother		N	%	N	%	N	%
	Employed	282	26.3	359	30.7	641	28.6
	Unemployed	776	72.3	802	68.5	1 578	70.3
	Retired	16	1.5	10	0.9	26	1.2
	Total[c]	**1 074**	**100.0**	**1 171**	**100.0**	**2 245**	**100.0**
Father							
	Employed	960	90.1	1070	91.7	2030	90.9
	Unemployed	63	5.9	36	3.1	99	4.4
	Retired	43	4.0	61	5.2	104	4.7
	Total[d]	**1 066**	**100.0**	**1 167**	**100.0**	**2 233**	**100.0**

[a] Response rate for this question: 99.2% (2 238/2 257)
[b] Response rate for this question: 98.9% (2 233/2 257)
[c] Response rate for this question: 99.5% (2 245/2 257)
[d] Response rate for this question: 98.9% (2 233/2 257)

Summary of sociodemographic characteristics

1. The majority of respondents were single and nearly two fifths were living with their families.
2. The majority of the respondents belong to nuclear families.
3. Ninetyfive percent of the respondents had at least one sibling and the average number of siblings was 2.6.
4. The education level of mothers was lower than the fathers. The education level of the fathers of female respondents was higher than that of male respondents.
5. The employment rate of both parents of female students was higher than that of male students.

9.2 Adverse childhood experiences among the respondents

9.2.1 Prevalence of history of child maltreatment

Under child maltreatment, the answers of respondents to the questions pertaining to the history of physical abuse, sexual abuse, emotional abuse, emotional neglect and physical neglect during the first 18 years of life were analysed. Detailed tables of responses of participants and prevalence tables (Table A2.1–Table A2.4) may be seen in Annex 2.

9.2.2 Physical abuse

The analysis of the responses to three questions on physical abuse shows that the prevalence of physical abuse was 26.2% among male respondents and 16.3% among female respondents. The difference between male and female was statistically significant (P<0.001).

9.2.3 Sexual abuse

The answers of respondents to four questions concerning history of contact sexual abuse (touching and or penetration during the first 18 years of life were analysed). The results suggest that the prevalence of child sexual abuse was 8.7% among male and 7.2% among female. Overall, the prevalence of child sexual abuse was 7.9% .The average age of the victim was 12.8 years for male and 9.06 in female when the first act of abuse occurred and the difference was statistically significant (P<0.001). As regards the relationship of the abuser to the victim, nearly one-third of perpetrators were strangers (Table 9.4). Considering all forms of abuse, 68% of perpetrators who abused girls were men, and 83% of perpetrators who abused boys were women.

Table 9.4 Relationship with the abuser

Type of relationship	Sex of the victim				Total	
	Male		Female			
	N	%	N	%	N	%
Relative who was living in the house	8	10.3	5	6.8	13	8.6
Person who was living in the house and who was not a relative	13	16.7	4	5.5	17	11.3
Relative who was not living in the house	14	17.9	24	32.9	38	25.2
Someone she/he knew who and was not living in the house	35	44.9	21	28.8	56	37.1
A stranger	28	35.9	23	31.5	51	33.8
Someone who was considered to be taking care of her/him (like the babysitter)	7	8.9	5	6.8	12	7.9
Someone who she/he trusted	13	16.7	4	5.5	17	11.3

9.2.4 Emotional abuse

The prevalence of emotional abuse was 9.8% among all respondents based on responses to the four questions on emotional abuse. The prevalence of emotional abuse was higher among male (10.7%) than female (8.9%).

9.2.5 Emotional neglect

Overall, the prevalence of emotional neglect was 8.8% (195/2 221). The prevalence was 11.3% (120/1 060) for girls and 6.5% (75/1 161) for boys. The difference between male and female was statistically significant (P<0.001). The response rate to questions about emotional neglect was 98.4%.

9.2.6 Physical neglect

The prevalence of overall physical neglect was 5.7%, and was significantly higher among males than females (7.0% versus 4.6%).

9.2.7 Prevalence of household dysfunction among respondents

Household dysfunction was examined to obtain the prevalence of:

- domestic violence;
- separated or divorced parents;
- depressed or suicidal household members;
- problem alcohol use by household members;
- street drug use by household members; and
- household members involved in crime or imprisoned was examined.

Frequency tables for household dysfunction parameters may be seen in Annex 2 (A2.5-A2.10).

9.2.8 Domestic violence

To estimate the prevalence of exposure to domestic violence, the study included questions about four different circumstances involving violence between parents. The overall prevalence of exposure to domestic violence was 18.4%. The prevalence was significantly higher among males (20.9%) than females (16.1%).

9.2.9 Separated or divorced parents

A total of 2 244 respondents answered the question "Are your parents divorced or ever separated?". Response rate was 99.4%. Of these, 5.2% of respondents reported divorced or separated parents and this was similar between male and female. The results show that 51 respondents (43.9%) with separated parents lived with stepmothers and 15 (12.9%) with stepfathers.

9.2.10 Depressed or suicidal household members

On average, 9.3% of respondents reported one or more family members who had a history of being depressed or attempted suicide. This was significantly higher among females (11.3%) than males (7.1%).

9.2.11 Problem alcohol use by household members

In total, 2 247 respondents answered the question "For a period of time, did you share the same house with a person who had alcohol problem or who was an alcoholic?" (Response rate of 99.6%). Almost 6.5% of respondents reported living part of their lives with a problem alcohol drinker or alcoholic family member and this was significantly higher among males (7.5%) than females (5.3%).

9.2.12 Street drug use by householdmembers

In total, 2 250 respondents answered the question about street drug use by a household member (response rate: 99.7%). The prevalence was 3.4% and significantly higher among males (4.8%) than females (2.0%).

9.2.13 Household members involved in crime or imprisoned

The overall prevalence of involvement in crime or imprisonment by a household member was 10.3%. The prevalence was significantly higher among males (12.0%) than females (8.7%).

9.3 ACE scores

Questions about ACEs were divided into two categories: child maltreatment and household dysfunction. Table 9.5 shows the prevalence of ACEs among 2 257 respondents.

Table 9.5. Prevalence of ACEs by sex

ACE scores	Male		Female		Total	
	Number	%	Number	%	Number	%
Child maltreatment						
Physical abuse	283***	26.2	192***	16.3	475***	21.1
Sexual abuse	78	8.7	73	7.2	151	7.9
Emotional abuse	112	10.7	102	8.9	214	9.8
Emotional neglect	120***	11.3	75***	6.5	195***	8.8
Physical neglect	73*	7.0	52*	4.6	125*	5.7
Household dysfunction						
Domestic violence	220**	20.9	183**	16.1	403**	18.4
Separated or divorced parents	53	4.9	63	5.4	116	5.2
Depressed or suicidal household member	77***	7.1	132***	11.3	209***	9.3
Problem alcohol use by household member	81*	7.5	62*	5.3	143*	6.4
Street drug use by household member	52***	4.8	24***	2.0	76***	3.4
Household member criminal or imprisoned	130**	12.0	102**	8.7	232**	10.3

*P<0.05; **P<0.01; ***P<0.001

As it is possible to observe in Table 9.6, the response rates vary depending on the type of ACE. The response rate of the questions about sexual abuse was the lowest (85%). The response rate of the other questions varied between 96.4% and 99.9%. Overall, 77.9% of the respondents answered all ACE questions.

Table 9.6. Response rate of ACE questions

ACE scores	Response rate (%)
Child maltreatment	
Physical abuse	99.9
Sexual abuse	85.0
Emotional abuse	97.0
Emotional neglect	98.4
Physical neglect	96.4
Household dysfunction	
Domestic violence	97.0
Separated or divorced parents	99.4
Depressed or suicidal household member	99.6
Problem alcohol use by household member	99.6
Street drug use by household member	99.7
Household member involved in crime or imprisoned	99.6
Total	**77.9**

The ACE scores were calculated by adding up the number of ACEs (Box 1.5). About 22% of the 2 257 respondents did not completely answer all subcategories of the questions about ACEs. The ACE scores of these respondents were thus excluded from further analyses. Therefore, only the data from the answers of 1 759 respondents were considered in evaluating the relationship between the ACE score and health risk behaviours and health outcomes which may be associated with the ACE score.

Box 1.5. Calculation of the ACE score

To estimate prevalence of household dysfunction (Domestic violence, separated or divorced parents, depressed or suicidal household member, harmful alcohol use by household member, street drug use by household member and household member involved in crime or imprisoned)

Table 9.7 shows the distribution of ACE score of 1 759 respondents by sex. Of those, 885 respondents (50.3%) reported no ACE. The remaining 49.7% had at least one ACE. ACE prevalence was higher among males than females (*P*<0.001).

Table 9.7. ACE scores by sex

ACE Score	Sex		Total, Number (%)
	Male, Number (%)	Female, Number (%)	
0	367 (44.6)	518 (55.3)	885 (50.3)
1	207 (25.2)	213 (22.8)	420 (23.9)
2	115 (14.0)	99 (10.6)	214 (12.2)
3	62 (7.5)	53 (5.7)	115 (6.5)
4 +	72 (8.7)	53 (5.7)	125 (7.1)
Total	**823 (100.0)**	**936 (100.0)**	**1 759 (100.0)**

Table 9.8 shows the relationship among different ACE categories. The different types of ACEs were significantly associated. The most interesting finding was the high prevalence of physical abuse and domestic violence concurrent with other adverse experiences. In all ACE categories, 31.0–50.9% of respondents were also victims of physical abuse. Similarly, 31.3–53.5% of respondents who had otherACEs also suffered domestic violence.

Table 9.8. Relationship between the categories of different types of maltreatment and household dysfunction

ACE category	N[a]	Physical abuse	Sexual abuse	Emotional abuse	Emotional neglect	Physical neglect	Domestic violence	Separated or divorced parents	Depressed or suicidal household member	Problem alcohol use by household member	Street drug use by household member	Household member involved in crime or imprisoned
Physical abuse	342	-	50*** (14.6%)	83*** (24.3%)	63*** (18.4%)	33*** (9.6%)	168*** (49.1%)	36*** (10.5%)	70*** (20.5%)	35** (10.2%)	20** (5.8%)	68*** (19.9%)
Sexual abuse	133	50*** (37.6%)	-	32*** (24.1%)	22** (16.5%)	15** (11.3%)	55*** (41.4%)	17*** (12.8%)	28*** (21.1%)	19*** (14.3%)	12*** (9.0%)	27*** (20.3%)
Emotional abuse	162	83*** (51.2%)	32*** (19.8%)	-	53*** (32.7%)	33*** (20.4%)	72*** (44.4%)	25*** (15.4%)	38*** (23.5%)	24*** (14.8%)	10* (6.2%)	36*** (22.2%)
Emotional neglect	154	63*** (40.9%)	22** (14.3%)	53*** (34.4%)	-	21*** (13.6%)	67*** (43.5%)	24*** (15.6%)	33*** (21.4%)	21*** (13.6%)	15*** (9.7%)	26** (16.9%)
Physical neglect	99	33*** (33.3%)	15*** (15.2%)	33*** (33.3%)	21*** (21.2%)	-	31** (31.3%)	7 (7.1%)	17** (17.2%)	15*** (15.1%)	11*** (11.1%)	14 (14.1%)
Domestic violence	323	168*** (52.0%)	55*** (17.0%)	72*** (22.3%)	67*** (20.7%)	31** (9.6%)	-	53*** (16.4%)	68*** (21.1%)	43*** (13.3%)	23*** (7.1%)	68*** (21.1%)
Separated or divorced parents	99	36*** (36.4%)	17*** (17.2%)	25*** (25.3%)	24*** (24.2%)	7 (7.1%)	53*** (53.5%)	-	26*** (26.3%)	30*** (30.3%)	14*** (14.1%)	32*** (32.3%)
Depressed or suicidal household member	163	70*** (42.9%)	28*** (17.2%)	38*** (23.3%)	33*** (20.2%)	17** (10.4%)	68*** (41.7%)	26*** (16.0%)	-	24*** (14.7%)	16*** (9.8%)	50*** (30.7%)
Problem alcohol use by household member	113	35** (31.0%)	19*** (16.8%)	24*** (21.2%)	21*** (18.6%)	15*** (13.3%)	43*** (38.1%)	30*** (26.5%)	24*** (21.2%)	-	17*** (15.0%)	36*** (31.9%)
Street drug use by household member	55	20** (36.4%)	12*** (21.8%)	10* (18.2%)	15*** (27.3%)	11*** (20.0%)	23*** (41.8%)	14*** (25.4%)	16*** (29.1%)	17*** (30.9%)	-	22*** (40.0%)
Household member involved in crime or imprisoned	183	68*** (37.2%)	27*** (14.8%)	36*** (19.7%)	26** (14.2%)	14 (7.6%)	68*** (37.1%)	32*** (17.5%)	50*** (27.3%)	36*** (19.7%)	22*** (12.0%)	-

[a]Number of victims of ACEs in the first column. Subsequent columns show numbers (Percentages)who also have other ACEs.

* *P*<0.05, ** *P*<0.01, *** *P*<0.00.

9.3.1 Relationship between the sociodemographic and socioeconomic characteristics and ACE scores of respondents

Table 9.9 shows the relationship between the family type of respondents and occurrence of an ACE. The prevalence of history of at least one ACE was higher in the "other" category which mainly included respondents with fragmented families, and among respondents with extended families. The difference between history of ACEs and family type was statistically significant (*P*<0.001).

Table 9.9. Relationship between family type and history of ACE

Family type[a]	ACEs		OR (95% CI)[c]
	Negative, N (%[b])	Positive, N (%[b])	
Nuclear family	813 (52.4)	739 (47.6)	1
Extended family	61 (36.3)	107 (63.7)	1.93 (1.39–2.68)
Others	6 (21.4)	22-7 (8.6)	4.03 (1.63–10.00)
Total	880 (50.3)	868 (49.7)	–

[a] The analysis covers data from 1748 respondents who answered the question about family type.
[b] Row percentage.
[c] OR: Odds Ratio; CI: confidence interval.

As regards the relationship between the number of siblings and ACE score, the number of siblings on average was 2.74 (± 2.44) among respondents with at least one ACE and 2.05 (± 1.69) among respondents with no history of ACEs. ACE score rises parallel to the increase in siblings number (*P*<0.001) (Fig. 9.2).

Fig. 9.2. Relationship between sibling number and ACE scores (ANOVA, *P*<0.001)

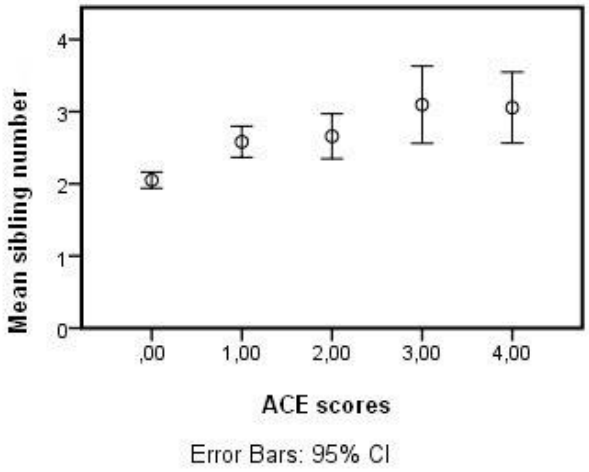


Table 9.10 shows the relationship between the educational status of parents and ACE score. Prevalence of at least one ACE was higher among respondents with low education status. Prevalence of ACE declines as the education level of both parents rises. The difference in ACE prevalence in relation to educational status was statistically significant.

Table 9.10. Educational status of parents and history of at least one ACE

Parent's education status[a]		ACEs	
		Negative, N (%[b])	Positive, N (%[b])
Mother[c]			
	Low	387 (45.1)	471 (54.9)
	Middle	257 (52.9)	229 (47.1)
	High	237 (58.7%)	167 (41.3)
	Total	**881 (50.4)**	**867 (49.6)**
Father[c]			
	Low	211 (39.7)	320 (60.3)
	Middle	304(52.1)	280 (47.9)
	High	365 (57.8)	266 (42.2)
	Total[b]	**880 (50.4)**	**866 (49.6)**

[a] The analysis covers data from 1748 respondents who answered this question.
[b] Row percentage.
[c] Pearson Chi-Square,*P*<0.001.

Summary evaluation

1. The overall prevalence of childhood physical abuse was 21.1%. The prevalence was significantly higher among male (26.2%) than female respondents (16.3%).

2. Overall, the prevalence of childhood sexual abuse was 7.9%. The difference in the prevalence of childhood sexual abuse was not significant between male and female respondents. The perpetrator was somebody known to the child in two thirds of the cases.

3. The prevalence of emotional abuse was 9.8% among all respondents. The difference in the prevalence of emotional abuse was not significant between males and females respondents.

4. The overall prevalence of emotional neglect was 8.8%. The prevalence of emotional neglect was significantly higher among men (11.3%) than women (6.5%).

5. The overall prevalence of childhood physical neglect was 5.7%. The prevalence of physical neglect was higher among men.

6. Overall, the prevalence of exposure to domestic violence was 18.4% and the prevalence was significantly higher among men (20.9%) than women (16.1%).

7. The prevalence of divorced or separated parents was 5.2% among all participants.

8. The overall prevalence of depression or suicide attempt in the household was 9.3%.

9. The prevalence of problem alcohol use in the household was 6.4%. Similarly, 3.4% of respondents reported history of street drug use in the family.

10. The prevalence of involvement in crime or imprisonment of a household member was 10.3%.

11. The prevalence of physical abuse was the highest in all ACEs, followed by exposure to domestic violence. Nearly one fifth of all respondents reported both physical abuse and exposure to domestic violence.

12. The ACE scores indicate that half of all respondents had a history of at least one ACE. The number of different forms of ACEs was significantly higher among male respondents than women.

13. The prevalence of co-occurrence of different ACE forms was also significantly higher in almost all categories. As presented, 33–50% of respondents were exposed to physical abuse and domestic violence in co-occurrence with other ACE forms.

14. ACE prevalence was significant lower among respondents from nuclear families.

15. ACE score rises parallel to increased number of siblings.

16. As regards parental education status, ACE prevalence drops with higher education status of parents.

9.4 Health risk behaviours among the respondents

9.4.1 Prevalence of health risk behaviours

The section of the survey on health risk behaviours of respondents covers smoking and harmful alcohol and drug use (Table 9.11). The response rate to questions about sexual life was low in general. The 11.5% of the respondents reported active sexual life. Half of the respondents did not answer the question about the number of sexual partners. Therefore, data on sexual life were excluded from the statistical evaluation.

The prevalence of smoking was 26.4% in the whole group. Smoking prevalence was significantly higher among males than females. Daily cigarette consumption was also higher among males. There was no significant relationship between the smoking status of parents and the respondents.

Overall, the prevalence of alcohol use was 38.4% and harmful alcohol use was 10.1%. The prevalence of both was higher among male respondents. There was difference between males and females with respect to family members who use alcohol.

Overall, the prevalence of drug use was 4.1% and significantly higher among males than females. The rate of street drug use in the family was higher among males.

Although all passengers are obliged to use seat belts in vehicles according to regulations in Turkey *(95)* the rate of people whom are generally not using seat belts were 48.5% in the study group. There was no statistical difference between gender groups in terms of seat belt usage.

Table 9.11. Health risk behaviours, relationship between health risk behaviours and health risk behaviours by gender

Health risk behaviour	Male, N (%)	Female, N (%)	Total, N (%)
Smoking[a]	301 (36.9)	162 (17.3)	463 (26.4)
Number of cigarettes smoked per day[b]±SD	10.9±10.9	5.0±6.8	8.9±10.1
Alcohol drinking[a]	383 (47,1)	288 (30.9)	671 (38.4)
Harmful alcohol drinking[a]	107 (13,5)	63 (7.0)	170 (10.1)
Problem alcohol use by household member	58 (7,0)	55 (5.9)	113 (6.4)
Street drug using[a]	56 (7.1)	13 (1.5)	69 (4.1)
Street drug use by household member[c]	36 (4.4)	19 (2.0)	55 (3.1)
Not using seat belts	398 (50.1)	420 (47.0)	818 (48.5)

[a] Pearson Chi-Square, *P*<0.001.
[b] Student t-test, *P*<0.001.
[c] Pearson Chi-Square, *P*<0.01.

9.4.2 Relationship between risk behaviours and ACE scores of respondents

The relationship between health risk behaviours of respondents and different ACE types and ACE scores was examined using the logistic regression analysis. A model adjusting the impact of cofactors such as gender, age, maternal education status, and paternal education status.

The relation between reported childhood adverse events and health risk behaviours of respondents may be seen in Table 9.12. Risk for use of tobacco, consumption of alcohol and excessive alcohol use seemed to increase in association with exposure to all types of childhood adverse events, other than physical neglect.

As indicated in Table 9.13, the relationship between health risk behaviours and ACE score was evaluated by adjusting for gender, age, maternal education status, and paternal education status.

Smoking prevalence was 33.9% in respondents with a history of at least one ACE and 19.1% in non-ACE group (P<0.001). Smoking prevalence increases parallel to the increase in the ACE category. The risk of smoking increases by 1.54 times among respondents in ACE category 1 and 3.69 times in ACE category 4+ when compared to non-ACE group.

The prevalence of alcohol use and harmful alcohol use raises parallel to the increase in ACE category. Alcohol use prevalence was 35.2% and harmful alcohol use prevalence was 6.3% in non-ACE group, whereas the prevalence were 41.7% and 14.0% in respondents with a history of at least ACE (P<0.01 and P<0.001), respectively. The risk of harmful alcohol use increases by 2.14 times with 1 ACE compared to the non-ACE group. The risk increases by 4.46 times in ACE 4+ group.

Similar to alcohol use and smoking, the rate of street drug use rises as the ACE category increases. Street drug use prevalence was 6.7% in respondents with a history of at least one ACE but only 1.5% in non-ACE group (P<0.001). The risk of street drug use increases by 2.38 times with exposure to 1 ACE, and 4.52, 5.31 and 9.69 times in ACE categories 2, 3 and 4+, respectively.

Failure to use seat belt in traffic was one another health risk behaviour. Overall, the rate of seat belt use was low. The rate was even lower among students with an ACE history.

As seen in Fig. 9.3the risk by ACE category was the highest in street drug use. This was followed by harmful alcohol use and smoking. In particular, the risk of drug use rises rapidly parallel to the increase in ACE score.

Table 9.12. Prevalence and adjusted odds ratio (AOR) of health risk behaviours by ACE type

Risky behaviour	N (%)	(AOR[a], 95%CI)										
		Physical abuse	Sexual abuse	Emotional abuse	Emotional neglect	Physical neglect	Domestic violence	Separated or divorced parents	Depressed or suicidal household member	Problem alcohol use by household member	Street drug use by household member	Household member involved in crime or imprisoned
Smoking	463 (26.4)	1.55** (1.17–2.06)	2.41*** (1.59–3.63)	2.77*** (1.89–4.06)	1.03 (0.62–1.72)	1.03 (0.62–1.72)	1.56** (1.17–2.08)	3.06*** (1.89–4.93)	1.82** (1.23–2.71)	1.67* (1.05–2.64)	2.50** (1.31–4.78)	2.37*** (1.64-3.43)
Alcohol use	671 (38.4)	1.49** (1.14–1.93)	2.74*** (1.85–4.06)	1.64** (1.14–2.35)	1.28 (0.89–1.86)	0.67 (0.40–1.11)	1.39* (1.06–1.82)	4.16*** (2.56–6.77)	1.97*** (1.38–2.81)	3.14*** (2.06–4.80)	3.09*** (1.69–5.65)	1.79 *** (1.26-2.52)
Harmful alcohol use	170 (10.1)	1.58* (1.07 –2.31)	2.65*** (1.60–4.38)	2.24*** (1.38–3.65)	2.25** (1.36–3.74)	0.79 (0.33–1.89)	2.28*** (1.56–3.33)	3.67*** (2.17–6.22)	2.41*** (1.49–3.88)	3.47*** (2.08–5.80)	5.57*** (2.88–10.76)	2.42*** (1.51-3.88)
Street drug use	69 (4.1)	2.27** (1.34–3.84)	3.93*** (2.04–7.56)	2.80** (1.44–5.43)	2.75*** (1.41–5.36)	31.88 (0.76–4.67)	2.14** (1.24–3.69)	3.60*** (1.72–7.53)	2.43* (1..22–4.84)	2.28* (1.09–4.77)	18.83*** (9.29–38.10)	2.66*** (1.41-5.03)
No seatbelt use	818 (48.5)	1.62*** (1.26–2.09)	1.61* (1.09–2.37)	1.28 (0.90–1.81)	1.44* (1.01–2.07)	1.37 (0.87–2.15)	1.13 (0.87–1.46)	0.64 (0.41–1.01)	0.91 (0.64–1.28)	1.2 (0.82–1.84)	1.26 (0.71–2.25)	1.35 (0.97-1.88)

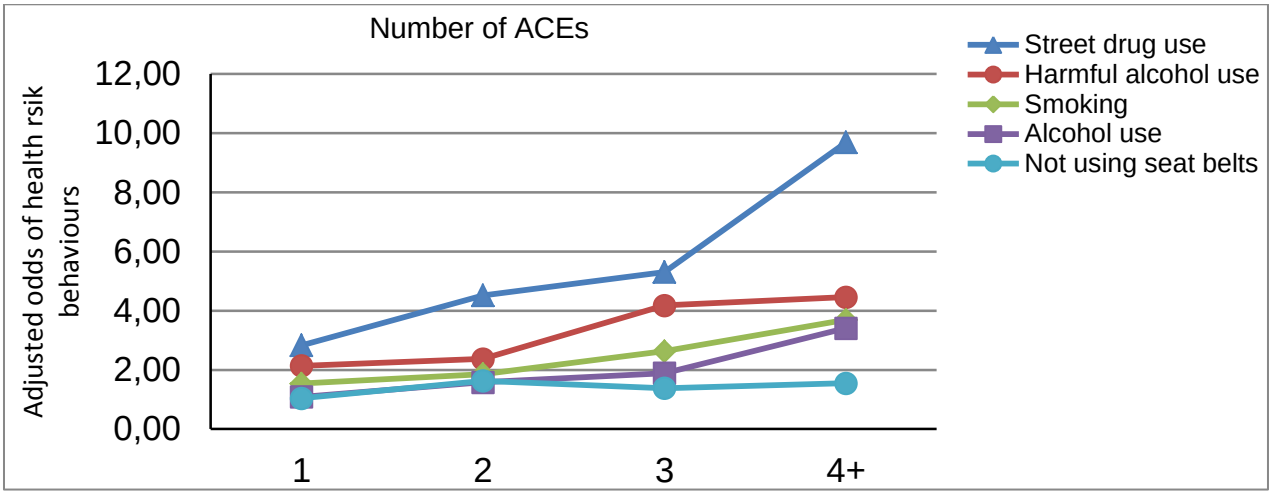
[a]AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender, age, parental education.
*P<0.05, **P<0.01, ***P<0.001.

Table 9.13. Prevalence and adjusted odds ratios of riskyhealthbehaviours of respondents according to the numbers of reported ACE category

Type of health risk behaviour		Number of ACEs				
		0 (N=885)	**1 (N=420)**	**2 (N=214)**	**3 (N=115)**	**4 + (N=125)**
Smoking	Prevalence	19,1%	28,3%	32,5%	40,4%	48,8%
	AOR (95% CI)	-	1.54** (1.16–2.04)	1.86*** (1.31–2.63)	2.63*** (1.71–4.05)	3.69*** (2.45–5.56)
Alcohol drinking	Prevalence	35,2%	36,3%	42,7%	41,6%	58,1%
	AOR (95% CI)	-	1.09 (0.83–1.42)	1.58** (1.13–2.22)	1.89** (1.22–2.92)	3.41*** (2.22–5.25)
Harmful alcohol drinking	Prevalence	6,3%	12,1%	12,8%	16,7%	20,0%
	AOR (95% CI)	-	2.14*** (1.40–3.28)	2.37** (1.40–4.00)	4.18*** (2.27–7.69)	4.46*** (2.51–7.92)
Street drug use	Prevalence	1,5%	4,7%	7,0%	6,5%	13,6%
	AOR (95% CI)	-	2.83** (1.37–5.89)	4.52*** (2.04–9.99)	5.31** (2.00–14.14)	9.69*** (4.34–21.63)
Not using seat belts	Prevalence	45.1%	46.4%	58.2%	55.1%	56.3%
	AOR (95% CI)	-	1.04 (0.82–1.34)	1.63** (1.18–2.25)	1.38 (0.90–2.11)	1.55* (1.03–2.34)

AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender, age, mother education and father education.
**P*<0.05, *** P*<0.01, ****P*<0.001.

Fig. 9.3. Relationship between adjusted odds of health risk behaviours and ACE scores



Summary evaluation

1. Nearly 25% of respondents were smokers. The smoking prevalence was significantly higher among individuals with ACE history. The prevalence increases together with the increase in the number of ACE category. The risk of smoking increases by 1.54–3.69 times depending on the ACE score.

2. The prevalence of alcohol use was 38.4% and harmful alcohol use was 10.1%. Respondents with an ACE history have a significantly higher prevalence of alcohol use and harmful alcohol use. In this group, the risk of alcohol consumption and harmful alcohol use increases by 1.58–4.46 times depending on the ACE score.

3. Overall, the prevalence of street drug use was 4.1%. The prevalence was 1.5% in non-ACE group and it increases up to 4–13.6% depending on the ACE score. Parallel to this, the risk of drug use increases by 2.83–9.69 times.

4. Nearly 50% of respondents do not wear seat belts in traffic. The rate was higher among individuals with an ACE history, but the difference was not significant compared to other health risk behaviours. The risk of not wearing seat belts increases by 1.55–1.63 times depending on the ACE score.

9.5 Health problems and somatic complaints of respondents and relationship with ACE scores.

ACEs lead to a number of health problems at adult age. The majority of the respondents in this study were in 18–23 age groups; therefore, it was not valid to obtain data about health problems that develop at an older age. Nevertheless, analyses were performed to indicate health problems existing or experienced before transition to adulthood. The relationship between the number of ACE categories of respondents and health problems was evaluated using the logistic regression analysis by adjusting the odds ratio (Adjusted Odds ratio-AOR),

for gender and age. The resulting AOR values indicate the level of risk posed by the increase in the number of ACE categories on the emergence of health problems.
Frequency tables for health problems according to gender groups may be seen in Annex 3 (Tables A3.1-A3.5).

9.5.1 Emotional problems

The symptoms of panic, uncontrolled anger, nervousness, depression, sleep problems, crying spells, and states of “trouble refusing requests”, “being more sensitive than most people” and “high stress level" were inquired in order to evaluate respondents' existing, previous or treated complaints. Overall, the prevalence of these problems varied from 16.2% to 50.6%. Nervousness and panic were the most common problems. Mood problems, including sleep problems and trouble refusing requests, were significantly higher among female respondents.

Table 9.14 shows the relationship between the health problems reported by respondents and the number of ACE categories. All emotional problems were clearly related to the history of ACEs. The risk of prevalence increases together with the increase in the number of ACE categories.

The increase in risk level is most evidence in depression, crying spells, uncontrolled anger, nervousness, and high stress level. The probability of risk increases together with the increase in the number of ACE categories. The risk of crying spells increases by 8.68 times, depression by 6.04 times, and uncontrolled anger by 5.59 times among individuals with four or more ACEs.

Table 9.14. Relationship between emotional problems and number of ACE categories

Emotional problems		Number of ACE Categories				
		0 (N=885)	**1 (N=420)**	**2 (N=214)**	**3 (N=115)**	**4 + (N=125)**
To be panicked in special circumstances	Prevalence	43.7%	41.9%	45.8%	60.0%	61.0%
	AOR (95% CI)	-	0.96 (0.75–1.22)	1.15 (0.84–1.57)	2.10*** (1.39–3.17)	2.17*** (1.45–3.25)
Uncontrolled anger	Prevalence	19.3%	25.5%	38.4%	41.7%	56.8%
	AOR (95% CI)	-	1.45* (1.09–1.93)	2.61*** (1.87–3.65)	3.01*** (1.97–4.60)	5.59*** (3.70–8.44)
Nervousness	Prevalence	43.3%	50.6%	58.6%	67.3%	73.3%
	AOR (95% CI)	-	1.39** (1.09–1.77)	1.96*** (1.43–2.69)	2.95*** (1.92–4.51)	3.78*** (2.45–5.85)
Depression	Prevalence	26.8%	37.8%	45.6%	54.4%	65.8%
	AOR (95% CI)	-	1.71*** (1.32–2.21)	2.44*** (1.77–3.37)	3.72*** (2.45–5.64)	6.04*** (3.96–9.23)
Crying spells	Prevalence	9.9%	15.9%	21.7%	34.5%	36.1%
	AOR (95% CI)	-	2.04*** (1.42–2.95)	3.33*** (2.17–5.13)	7.38*** (4.45–12.24)	8.68*** (5.27–14.29)
Sleep problems	Prevalence	26.5%	29.6%	38.6%	41.8%	47.9%
	AOR (95% CI)	-	1.18 (0.91–1.54)	1.79*** (1.29–2.48)	2.10*** (1.39–3.17)	2.64*** (1.78–3.94)
More sensitive than most people	Prevalence	33.9%	37.3%	42.2%	52.3%	59.6%
	AOR (95% CI)	-	1.18 (0.92–1.52)	1.49* (1.09–2.05)	2.31*** (1.53–3.48)	2.99*** (1.99–4.52)
Trouble refusing requests	Prevalence	32.1%	37.8%	42.6%	42.6%	55.9%
	AOR (95% CI)	-	1.32* (1.03–1.69)	1.63** (1.19–2.23)	1.60* (1.06–2.42)	2.78*** (1.87–4.13)
High stress level	Prevalence	19.7%	25.5%	29.1%	31.9%	47.5%
	AOR (95% CI)	-	1.47** (1.11–1.95)	1.78** (1.26–2.52)	2.10** (1.36–3.25)	4.29*** (2.85–6.45)

AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender and age.

* $P<0.05$, ** $P<0.01$, ***$P<0.001$.

9.5.2 Cerebrovascular symptoms

Cerebrovascular problems often occur at advanced ages. The prevalence of problems other than headaches and attacks of dizziness was relatively lower among respondents. The most common complaints were frequent headaches (33.4%), and attacks of dizziness (16.8%), while the prevalence of other problems was less than 10%. The prevalence of symptoms other than high blood pressure was higher among females.

Although cerebrovascular problems were considered to pertain to old age, the prevalence of other problems excluding high blood pressure was higher among respondents 95% of whom were in 18–23 age groups (Table 9.15).

Table 9.15. Relationship between cerebrovascular symptoms and the number of ACE categories

Symptoms		Number of ACE Categories				
		0 (N=885)	**1 (N=420)**	**2 (N=214)**	**3 (N=115)**	**4 + (N=125)**
High blood pressure	Prevalence	3.9%	4.9%	8.6%	6.3%	9.4%
	AOR (95% CI)	-	1.12 (0.61–2.05)	2.03 (1.08–3.86)	1.56 (0.62–3.89)	1.84 (0.85–3.99)
Frequent headaches	Prevalence	28.3%	36.0%	39.1%	39.4%	46.9%
	AOR (95% CI)	-	1.52** (1.17–1.97)	1.78** (1.28–2.48)	1.83** (1.20–2.79)	2.64*** (1.75–3.99)
Attacks of dizziness	Prevalence	13.0%	15.8%	21.5%	22.9%	34.5%
	AOR (95% CI)	-	1.33 (0.95–1.88)	1.98** (1.33–2.95)	2.11** (1.27–3.49)	4.15*** (2.64–6.51)
Seizures, convulsions, fits	Prevalence	2.9%	3.9%	5.4%	7.3%	11.4%
	AOR (95% CI)	-	1.46 (0.77–2.78)	2.02 (0.97–4.19)	2.89* (1.26–6.61)	4.69*** (2.29–9.58)
Loss of consciousness	Prevalence	5.5%	7.1%	10.2%	10.0%	18.3%
	AOR (95% CI)	-	1.39 (0.86–2.26)	2.12** (1.23–3.66)	2.09* (1.04–4.20)	4.59*** (2.59–8.14)
Temporarily lost control of hand or foot	Prevalence	5.7%	6.6%	9.7%	16.4%	21.7%
	AOR (95% CI)	-	1.21 (0.74–197)	1.87* (1.08–3.24)	3.47*** (1.93–6.26)	4.96*** (2.88–8.53)

AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender and age.

* $P<0.05$, ** $P<0.01$, ***$P<0.001$.

Furthermore, the risk of prevalence increases parallel to the increase in the number of ACE categories. The risk of attacks of dizziness, seizures and convulsions, and loss of consciousness without an obvious cause, or temporary loss of hand-feet control is four times higher among respondents with 4+ ACEs versus non-ACE respondents.

9.4.3 Gastrointestinal symptoms

Abdominal pain was the most common complaint (38%). In particular, nearly 50% of female respondents reported abdominal pain. This was followed by indigestion and constipation. These complaints were significantly higher among females than males. Table 9.16 shows the relationship between ACEs and gastrointestinal symptoms. The prevalence of gastrointestinal symptoms was higher among respondents with ACEs. In particular, the risk of dyspeptic complaints and constipation is significantly higher among respondents with ACE history, and the risk increases together with the increase in the number of ACE categories. The risk of other gastrointestinal symptoms is significantly higher among respondents with 4+ ACEs.

Table 9.16. Relationship between gastrointestinal symptoms and the number of ACE categories

Symptoms		Number of ACE Categories				
		0 (N=885)	**1 (N=420)**	**2 (N=214)**	**3 (N=115)**	**4 + (N=125)**
Stomach ulcer	Prevalence	7.5%	8.8%	14.1%	12.4%	14.8%
	AOR (95% CI)	-	1.20 (0.77–1.88)	2.15** (1.31–3.52)	1.93 (0.98–3.76)	2.23* (1.21–4.12)
Vomited blood	Prevalence	0.3%	0.8%	1.6%	1.1%	3.8%
	AOR (95% CI)	-	2.96 (0.49–17.93)	5.90 (0.97–35.96)	4.02 (0.36–4.18)	14.99** (2.66–84.46)
Abdominal pains	Prevalence	35.7%	37.7%	39.9%	41.1%	50.9%
	AOR (95% CI)	-	1.16 (0.89–1.49)	1.33 (0.96–1.85)	1.40 (0.91–2.14)	2.33*** (1.54–3.53)
Frequent indigestion or heartburn	Prevalence	18.1%	22.3%	29.7%	29.2%	50.0%
	AOR (95% CI)	-	1.29 (0.95–1.73)	1.95*** (1.36–2.77)	1.97** (1.24–3.12)	4.63*** (3.05–7.04)
Constipation	Prevalence	16.9%	23.5%	24.5%	29.2%	33.0%
	AOR (95% CI)	-	1.66** (1.23–2.25)	1.86** (1.26–2.73)	2.43*** (1.51–3.92)	3.01*** (1.90–4.78)
Frequent diarrhoea	Prevalence	6.8%	11.3%	8.1%	14.7%	21.6%
	AOR (95% CI)	-	1.68* (1.11–2.56)	1.16 (0.65–2.07)	2.45** (1.32–4.54)	3.66*** (2.14–6.27)

AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender and age.

* P<0.05, ** P <0.01, *** P <0.001.

9.5.4 Other health problems

Under the category of other health problems, nonspecific problems including backache, thyroid diseases, eczema, and sexually transmitted infections were inquired. Table 9.17 shows the relationship between the other health problems and number of ACE categories. The prevalence of back pain increased parallel to the increase in the number of ACE categories; but the relationship was only significant for respondents with 4+ ACEs. There was not significant relationship between nonspecific health problems of respondents such as thyroid, eczema and venereal disease, and the number of ACE categories.

Table 9.17. Relationship between other health problems and the number of ACE categories

Complaint or symptoms		Number of ACE Categories				
		0 (N=885)	**1 (N=420)**	**2 (N=214)**	**3 (N=115)**	**4 + (N=125)**
Frequent back pain	Prevalence	26.1%	27.8%	29.2%	29.9%	50.9%
	AOR (95% CI)	-	1.14 (0.87–1.50)	1.26 (0.89–1.78)	1.32 (0.84–2.07)	3.41*** (2.26–5.14)
Thyroid disease	Prevalence	3.5%	2.5%	3.0%	3.6%	4.5%
	AOR (95% CI)	-	0.67 (0.32–1.40)	0.86 (0.35–2.11)	1.15 (0.39–3.40)	1.30 0.48–5.51)
Eczema	Prevalence	8.5%	7.1%	13.3%	6.4%	21.1%
	AOR (95% CI)	-	0.86 (0.55–1.35)	1.79* (1.11–2.89)	0.82 (0.39–1.83)	3.01*** (1.77–5.10)
Venereal disease	Prevalence	0.7%	0.5%	1.0%	0.9%	3.6%
	AOR (95% CI)	-	0.51 (0.10–2.60)	1.01 (0.19–5.18)	1.12 (0.13–9.76)	2.92 (0.76–11.28)

AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender and age.
* P<0.05, ** P <0.01, *** P <0.001.

9.5.5 Perception of respondents about general health status

The respondents were asked about their perception of tiredness, worry about being ill, and health status in order to assess their health status. Nearly half of the respondents reported tiredness and 23.4% reported worry about being ill. These complaints were higher among females than males. Despite all stated health problems, only 2.4% of male and 1.6% of females reported poor health status.

Table 9.18 shows the relationship between the perceived health status of respondents and the number of ACE categories. The prevalence of tiredness, worry about being ill or perception of poor health was higher among individuals with ACE history. In terms of risk assessment, negative perception of health status is significantly higher among respondents with 3+ ACEs.

Table 9.18. Relationship between perceived health status and the number of ACE categories

Health perception		Number of ACE Categories				
		0 (N=885)	**1 (N=420)**	**2 (N=214)**	**3 (N=115)**	**4 + (N=125)**
Tiredness	Prevalence	40.6%	43.1%	56.7%	57.8%	67.5%
	AOR (95% CI)	-	1.12 (0.88–1.43)	1.97*** (1.44–2.69)	2.12*** (1.41–3.18)	3.21*** (2.12–4.86)
Worried about being ill	Prevalence	20.3%	23.6%	25.5%	29.4%	37.5%
	AOR (95% CI)	-	1.23 (0.92–1.65)	1.38 (0.96–1.98)	1.71* (1.08–2.71)	2.41*** (1.58–3.69)
Poor health status	Prevalence	1.1%	1.0%	1.9%	7.8%	6.4%
	AOR (95% CI)	-	0.74 (0.24–2.50)	1.53 (0.47–4.99)	7.17*** (2.81–18.31)	4.86** (1.81–13.01)

AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender and age.
* P<0.05, ** P <0.01, *** P <0.001.

Summary evaluation

1. Half of the respondents reported panic and nervousness. On average, 16–38% of the participants often experience the other emotional problems. The prevalence of emotional problems increases together with the increase in the number of ACE categories The prevalence of crying spells, depression, uncontrolled anger, high stress level, nervousness, and trouble refusing requests increases together with the number of ACE categories. Parallel to this, the risk of prevalence of emotional problems increases by 6–8 times.

2. The prevalence of cerebrovascular problems was low in the study group. Frequent headache was the most common problem (33.4%) among the respondents. The rate of cerebrovascular complaints was higher among respondents who had ACEs. Similarly, the risk of prevalence of these symptoms increases up to 4.96 times together with the increase in the number of ACE categories.

3. With the exception of vomiting blood, 10–38% of the participants reported gastrointestinal problems. The prevalence is higher among participants who have a history of ACE and the risk ofprevalence increases by 2.23–4.63 times together with the increase in the number of ACE categories.

4. As regards respondents' perception of their health status, nearly 50% of the respondents feel tired and 25% worry about being ill. Respondents with a history of ACE have a poorer perception of health status and the risk of prevalence increases by 2–4 times depending on the increase in the number of ACE categories.

9.6 Problem areas in the lives of respondents and relationship with ACE scores

Respondents were asked to answer questions in three categories (family, school and financial matters) in order to identify the serious problem areas. Table 9.19 shows the gender distribution of respondents who reported serious problems in selected areas. As showed, 21.0% of respondents reported serious financial problems and 19.5% stated they have problems related to school. The prevalences of serious problems in both areas were higher among males.

Table 9.19. Distribution of serious financial, family or school related problems by gender

Serious or disturbing problem area	Male N (%)	Female N (%)	Total N (%)
Family	76(9.7)	69 (7.8)	145 (8.7)
School* **	185 (23.4)	143 (16.1)	328 (19.5)
Financial matters* **	214 (27.1)	137 (15.5)	351 (21.0)

***$P<0.001$

Table 9.20 shows the relationship between the history of ACEs and serious problems in financial matters, at school or in the family. ACEs are known to have a negative impact on social relationships and success at school. The data from the respondents confirmed this fact. The risk of serious family-related problems increases significantly together with ACEs. Furthermore, the risk of prevalence increases together with the increase in the number of ACE categories. Respondents with a history of ACE also reported financial problems. The risk of prevalence increases up to 9.4 times depending on the number of ACE categories.

Table 9.20. Relationship between history of ACEs and serious problems in financial matters, at school or in the family

Serious or disturbing problem area		Number of ACE Categories				
		0 (N=885)	**1 (N=420)**	**2 (N=214)**	**3 (N=115)**	**4 + (N=125)**
Family	Prevalence	2.6%	6.5%	10.2%	23.6%	43.6%
	AOR (95% CI)	-	2.66** 1.48–4.76	4.32*** 2.32–8.05	11.95*** 6.42–22.22	29.10*** 16.46–51.46
School	Prevalence	15.3%	21.5%	20.9%	27.1%	34.8%
	AOR (95% CI)	-	1.45* 1.07–1.97	1.37 0.93–2.03	1.95** 1.22–3.12	2.72*** 1.75–4.22
Financial matters	Prevalence	10.7%	22.9%	30.2%	41.9%	56.3%
	AOR (95% CI)	-	2.32*** 1.68–3.21	3.36*** 2.31–4.89	5.80*** 3.70–9.11	9.40*** 6.05–14.61

AOR: Adjusted Odds Ratio; CI: confidence interval. Odds ratios adjusted for gender and age.
* P<0.05, ** P <0.01, *** P <0.001.

Summary evaluation

1. The prevalence of respondents with a history of ACEs who reported family-related problems was significantly high. The risk of prevalence increases by 2.66–29.10 times in association with an increase in the number of ACE categories.
2. Similarly, respondents with a history of ACEs were more likely to have problems at school. The risk of prevalence increases by 1.45–2.72 times in association with increasing ACE score.
3. The 21% of the respondents had problems in financial matters. The risk of prevalence increases significantly with the ACE score. The risk of prevalence increases by 2.32–9.40 times together with the increase in the number of ACEs.

10. Discussion

This study was conducted in a group of university students in Turkey in order to identify the prevalence of ACEs during the first 18 years of life and to examine the relationship between the history of ACEs, health risk behaviours, and certain health symptoms. The study is not representative of all university students in Turkey. Furthermoreuniversity students tend to represent more privileged social strata for the results to be generalized to the whole young population. However, the data from the study may give an idea about the experience of ACEs in university students in Turkey and the impact of these experiences.

For the purposes of the study, ACEs are divided into two categories, namely "child maltreatment" and "household dysfunction". These are further divided into subcategories on different forms of abuse and neglect and circumstances which may disrupt the family dynamics and environment and create stress factors for the child.

10.1 Child maltreatment

The study suggests that the most common form of maltreatment is physical abuse. Nearly 20% of students reported exposure to childhood physical abuse. The prevalence of childhood abuse is higher among male than female respondents. One of the first studies on childhood abuse in Turkey was conducted between 1981 and 1989 on 50 000 children aged 4–12 years (87). The study suggested that 62% children were disciplined using corporal punishment. Other studies conducted in the course of the past 10 years estimated the prevalence of childhood physical violence at 13–48% (35–39). The 2012 Balkan Epidemiological Study on Child Abuse and Neglect (BECAN) estimated the prevalence of physical violence against children aged 11–16 at 58% (88). The reason for the incompatibility between the data of this study and BECAN is the difference of criteria of physical abuse and the fact that the prevalence of physical violence in BECAN was on self-reported data of children. In addition, recall bias should not be disregarded when inquiring adults about childhood experiences.

The European ACE studies, which use the same WHO/CDC-recommended methodology as this survey, suggest similar estimates on childhood physical abuse. The ACE study in young people of the former Yugoslav Republic of Macedonia estimated the prevalence of physical abuse at 21% (79). The prevalence of physical abuse was 27% in the ACE survey of university students in Romania and 41.5% in Albania *(77,78)*. The prevalence of physical abuse for both genders is estimated at 22.9% in the European region *(3)*. The data on the prevalence of physical abuse is consistent with the combined data of the European region. However, the prevalence of childhood physical violence is higher among male than female respondents.

Physical violence is often considered an acceptable disciplinary practice. Certain disciplinary practices were included in the definition of physical violence in a 2006 study in Turkey *(89)*. From this perspective, boys seem to be exposed to corporal punishment or physical violence

more as part of disciplinary practice. Another important finding of this study is that physical violence co-occurs with other ACE forms. The study suggests that the risk of other forms of abuse and ACEs increases by 5.82 times among physically abused children. This indicates that physical violence is not an isolated issue but may occur alongside other ACEs.

Sexual abuse is one of the most serious adverse experiences in childhood. Children and adults who were sexually abused in childhood find it quite difficult to talk about the experience compared to other forms of maltreatment. Therefore, data on the prevalence of sexual abuse is often debatable. Our study estimated the prevalence of childhood sexual abuse at 8.7% for male and 7.2% for female, with no statistical difference between the genders. The survey of university students in Turkey conducted in 1999 estimated the prevalence of childhood sexual abuse at 21% *(90)*. A 2002 study of high school students in İstanbul suggested that the prevalence of childhood sexual abuse was 10.7%. According to the study, the perpetrator was a relative in 75%, someone known to the victim in 15.8% and a stranger in 9.2% of the cases *(35)*. In our study, the perpetrator was somebody known to the child in twothirds of the cases. A 2005 study covering 1 262 students at seven universities in Istanbul, Izmir, Ankara and Aydın provinces suggested that 28% of participants were sexually abused at least once during childhood (36). Another study on sexual abuse among 1 871 female high school students conducted in Istanbul in 2006 estimated the prevalence of sexual abuse at 13.4% *(37)*.

The prevalence of sexual abuse was lower in our study compared to the above mentioned studies carried out over the past 15 years in Turkey. However, it would be difficult to interpret this as a difference in the prevalence of sexual abuse in the country because neither our study nor the previous studies cover all the aspects of child sexual abuse in Turkey. Furthermore, it is difficult for studies on sexual abuse to access accurate information. This is mainly because respondents may be reluctant to provide accurate information and reveal their experiences due to the psychological effects of trauma, embarrassment, denial or fear of exposure of secrets. The same was true for our study, too: the response rate of sexual abuse was the lowest compared to other categories. The response rate of questions on other ACEs varied between 96.4% and 99.9%, whereas it was 85% for questions about sexual abuse. Another reason for the discrepancy in the results of different studies on sexual abuse is the selection of different criteria. Some studies covered forms of abuse involving touching only, while others addressed all forms of sexual approach and may not be comparable. A combined analysis in Europe estimated the prevalence of sexual abuse at 13.4% for girls and 5.7% for boys *(3)*. A study conducted in England in 2009 suggested that the prevalence of childhood sexual abuse was 17.8% among female and 5.1% among male in 18–24 age group *(53)*. The 2012 ACE study in Romania, which used a methodology and questionnaire similar to our study, estimated the prevalence of sexual abuse at 10.9% for boys and 5.6% for girls *(77)*. The Albanian ACE study conducted in the same year estimated the prevalence of child sexual abuse at 4.7% for girls and 8.8% for boys *(78)*. The ACE study of the former Yugoslav Republic of Macedonia estimated the prevalence

of child sexual abuse at 7.3% for girls and 20.8% for boys *(79).* The last two studies suggest a higher prevalence of child sexual abuse among boys than girls.

Similar to the analysis of the European data, the combined analyses of the studies on child sexual abuse worldwide indicate higher prevalence of abuse for girls *(53,91–93)*. However, the prevalence was higher among boys in our study and those conducted in the former Yugoslav Republic of Macedonia and Albania *(78,79)*. This gender difference may be linked to the fact that women may avoid reporting childhood sexual abuse and/or adolescent males may tend to over report sexual experiences with older women.

Unlike other forms of child maltreatment, emotional abuse is usually underrated as the traces are not immediately discernible but may impact in later life. Therefore, data and information on the prevalence of emotional abuse is insufficient. In our study, the overall prevalence of emotional abuse was 9.8%, with no significant difference between males and females. A 2007 study by an Inquiry Committee of the Turkish Grand National Assembly covering 26 009 secondary school students aged 13–18 suggested that 53% of the participants were victims of verbal abuse and 36% were abused emotionally *(38)*. Another study with 1 607 students aged 12–17 from low and middle income neighbourhoods in Izmir estimated the prevalence of emotional abuse at 60% *(39)*. These studies, even if limited in number, indicate a high prevalence of childhood emotional abuse in Turkey. However, the prevalence was lower in our study. The main reason of the discrepancy in prevalence is not the varying rates of prevalence but rather the difference in methodology and the evaluation criteria used in the questionnaires. A questionnaire comprising more questions than the one in our study would generate different information, and report less severe forms of emotional abuse. Therefore, it is difficult to recognize all aspects of the issue and reach a concusive judgment using only a limited number of questions.

A combined analysis of studies in Europe region estimated the prevalence of emotional abuse at 29.1% in the region *(3)*. The estimated prevalence of emotional abuse in ACE studies in college/university students Albania, the former Yugoslav Republic of Macedonia and Romania was 51%, 10.8% and 23.6%, respectively *(77–79)*. Our study used a similar methodology and questionnaire and thus is comparable to these studies. The difference in the prevalence of childhood emotional abuse is likely to be linked to socioeconomic and cultural characteristics of countries.

Child neglect is often the most underrated and ignored form of child maltreatment. The most comprehensive and multifaceted study on child neglect in Turkey was carried out in 2013 *(17)*. The study found educational and medical neglect in every three out of four children, neglect of social support in half of the children, nutritional neglect in one out of four children and emotional neglect and neglect of developmental support in one out of four children *(14)*. The overall prevalence of emotional neglect was 8.8% in our study. The prevalence was higher among males than females. Overall, the prevalence of physical abuse was 5.7% and, like emotional neglect, it was higher among males. A meta-analysis of a

limited number of studies on child neglect globally estimated the prevalence of emotional neglect at 18.4% and physical neglect at 16.3% *(3).* The prevalence of neglect is lower in our study compared to these results. A reason for this could be the low number of questions on neglect in our study. The results of ACE studies which use similar questionnaires indicate a prevalence of childhood emotional and physical neglect of 11.2% and 6.5% in Albania, and 26.3% and 16.5% in Romania *(77,78)*. The difference of child neglect prevalence in these countries, where the results were interpreted using similar criteria to ours, may pertain to the socioeconomic level of the study populations. It is striking that the prevalence of physical neglect is higher among male both in our study and in the others. This is perhaps because families tend to protect girls more.

Child maltreatment is aserious public health problem in all countries including high income countries *(8)*. On the other hand low socioeconomic status and lack of social support systems are clearly known risk factors for child maltreatment. In particular, poor and other disadvantaged groups are at greater risk. Differences in the prevalence of childhood adverse life events in different geographical regions may be related socioeconomic status as well as sociocultural differences *(3,7,94)*. Unfortunately our study results on childhood adverse life events were undertaken in university students, representing a relatively privileged social strata and cannot be generalized to populations of lower socioeconomic status, where the prevalence of ACEs may actually be higher and consequences more severe.

10.2 Household dysfunction

The results of our study suggest that the second highest ACE after physical abuse was exposure to domestic violence. Overall, the prevalence of exposure to domestic violence was 18.4%. The prevalence was higher among male respondents. Violence against women is an important component of domestic violence. Globally, 35.6% of women have ever experienced either non-partner sexual violenc, physical or sexual violence by an intimate partner, or both (96). The 2006–2007 study on *Violence against women and family members*in Turkey suggests that one out of every three women suffered physical violence from her partner *(97)*.

Exposure to domestic violence is per se a form of emotional violence for the child, and may also trigger exposure to other forms of violence *(3,26,53,71)*. Our study also indicates increased prevalence of other ACEs among children who have been exposed to domestic violence. The same is true for the ACE survey in Albania *(78)*. In our study, the prevalence of ACEs co-occurring with exposure to domestic violence is 77.8%. Domestic violence increases the risk of prevalence of other ACEs by 6.14 times. These data indicate that exposure to domestic violence is a multifaceted problem assoaciated with increased trauma in children.

Divorce is often a function of a dysfunctional or poor family environment that may be related child maltreatment and itself poses a risk for the development and mental health of the child *(73)*. It also contributes to other adverse experiences. Its traumatizing effects on

the child continue in adulthood especially because of its negative impact on the child-parent bonding (3,72,73).Such domestic problems which may adversely affect the health and wellbeing of the child; the prevalence of separated or divorced parents was found as 5.2% in our study. The ACE studies in the Eastern European region estimated the prevalence of divorced or separated parents at 3.8% in the former Yugoslav Republic of Macedonia, 6.6% in Albania, and 15.6% in Romania *(77–79)*. As divorce is related to the social, cultural and economic structural factors of countries, the divorce or separation rates may vary even among countries in the same region. Statistics indicate an increasing trend in divorce rates in Turkey. The crude divorce rate increased from 1.34% in 2007 to 1.62% in 2011 *(98)*.

The risk of domestic violence and child maltreatment increases when one or more of the problems of problem alcohol drinking or substance abuse of a household member exists *(3,22,23,27,50,74,75)*. Therefore, these adverse household experiences of the child are considered within ACEs. In our study population, the prevalence of harmful alcohol use in household was 6.4% and street drug use was 3.4%. The prevalence of harmful alcohol use by a household member is lower than the rates presented in similar studies in the European region *(48–50)*. The prevalence of alcohol drinking is usually linked to cultural and social traditions of a country, as well as access to alcohol. The majority of Turkish citizens are Muslims and Islam prohibits drinking alcohol. This may be the reason for low prevalence of problem alcohol use in our study compared to other countries. However, the prevalence of drug abuse in our study is higher than the reults from the ACE studies in Romania and Albania *(77,78)*.

The existence of a household member who has a psychiatric disorder or who attempted suicide is a domestic stress factor. The prevalence of this stress factor was 9.3% in our study. Psychiatric problems and suicide attempt of a household member and particularly of a parent adversely affect the emotional health and psychological development of the child *(24,25,28,99,100)*. The meta-analysis of 193 studies on the impact of depressed mothers on the mental health of children supports this suggestion *(25)*. Suicide of a parent is a risk factor in that it may trigger the child to develop suicidal tendencies *(24)*.

Another parameter of household dysfunction is a “household member involved in crime or imprisoned”. In our study, the prevalence of a household member involved in crime or imprisoned was 10.3%. Involvement in crime or imprisonment of a household member is an important risk factor for child maltreatment and there may be ramifications on the future violent, antisocial and criminal tendencies of children. A household member involved in crime or imprisoned may inflict partner violence, child neglect and have adverse impacts on the emotional development of the child *(26,29, 76)*. Furthermore, there is growing evidence for the intergenerational transmission of violence *(1,3)*. Children who have been abused are more likely to be victims or perpetrators of violence later in life.

10.3 ACE score

In our study, 49.7% of the respondents reported at least one of the 11 ACEs in the questionnaire. This rate was 64.9% in Romania, 72.4% in Albania and 64% in the former Yugoslav Republic of Macedonia in ACE studies in the Eastern European region which used similar questionnaires *(77–79)*. A similar study in the Philippines, a developing country, covering respondents aged 35 or above suggested that the prevalence of at least one ACE was 75% (14). The prevalence of at least one ACE was 47.1% in ACE UK covering a study population of individuals aged 18–70 *(49)*.

The studies on the relationship between child maltreatment and gender of the child indicate a higher prevalence of sexual abuse among female respondents (*91–93*). Some studies suggest that boys are subjected to severe physical violence more frequently than girls while some other studies indicate otherwise *(3,91–93)*. Unlike these findings, the prevalence of ACEs and the number of ACE categories were higher among males in our study. Male respondents were more likely to be exposed to all forms of maltreatment than females. As regards household dysfunction, the prevalence of problems other than separated or divorced parents and depressed or suicidal household member was higher among male respondents. The prevalence of ACES is higher among male respondents in ACE studies conducted in the former Yugoslav Republic of Macedonia and Albania *(78,79)*. The difference in the prevalence of childhood sexual abuse between the two genders which differs from previous studies needs further research taking into account social and cultural perspectives.

Another important finding in our study was the high prevalence of coexistence of several ACE categories. The prevalence of physical violence and exposure to domestic violence co-occurring with other forms of abuse and adverse experience is particularly high. The prevalence of another ACE is 77.8% among participants who were physically abused and 79.3% among those who were exposed to domestic violence. The strength of this association appears to increase with measures of severity of the physical abuse and domestic violence. The high risk of co-occurrence of several ACE types was also indicated in some previous studies *(53,77,79, 101, 102)*. This finding could provide guidance to efforts for preventing maltreatment and adverse experiences and protecting children from violence.

Examination of the sociodemographic characteristics among respondents who had an ACE and compare to those who did not, indicates that ACE prevalence is lower among respondents from nuclear families and the prevalence of at least one ACE was higher among those from fragmented families. This is consistent with findings suggesting that belonging to a stable nuclear family is a resilience factor in preventing child maltreatment *(3)*. The educational status of the mother and father was found to be inversely related to the prevalence of ACEs. The prevalence of ACE declines as the parental educational level rises; the decline is low but statistically significant. These results show that the known risks of child

maltreatment are valid for our study population *(3)*. This finding highlights the importance of education in preventive efforts.

The number of siblings was found to be related to the prevalence of ACEs. Respondents with at least one ACE have more siblings than those without an ACE. The number of ACE categories increases parallel to increased number of siblings. This is perhaps because crowded families with several children fail to notice the needs of the children and to provide adequate means for their protection and development.

10.4 Health risk behaviours

The negative impact of ACEs along the life course has been shown in many studies which covered large study populations *(3,12–14,48,49,53,71,102)*. Health risk behaviours underlie these powerful and widespread impacts which can even lead to premature death. Individuals seek help for their health risk behaviours in order to cope with their problems. Health risk behaviours including self-harm, smoking, harmful alcohol use, street drug use and frequent and unsafe sex are associated with worse health and may even lead to premature death *(3,12–14,16,27,49,103–106)*.

Smoking is a major factor that poses health risks. Smoking prevalence is 27.1% in Turkey according to the 2012 Tobacco Control Study *(107)*. The overall prevalence of smoking was 26.4% in our study. This rate declines to 19.1% among respondents who did not report any childhood adverse experience and rises to 33.9% among those who did. Experience ofACE is an important risk factor for smoking. The prevalence of smoking was higher among respondents with a history of ACE and the risk of prevalence increases up to 3.69 times together with the increase in the number of ACE categories. The relationship between ACEs and smoking has been indicated in several studies in different parts of the world *(14,15,49,59,77–79)*. These studies further suggest that there is a relationship between the existence of ACEs and age of starting smoking, and that individuals with ACEs start smoking at earlier ages. Our study did not inquire about the age of starting smoking.

Harmful alcohol use is another health risk. The prevalence of alcohol drinking was 13.3% in 2010 according to the report of the Workshop on Family Problems from a Regional Perspective by the General Directorate of Family and Social Studies of the Turkish Prime Ministry *(108)*. In our study, the overall prevalence of alcohol use was 38.4%. This rate is considerably higher than the Turkey average. The prevalence of alcohol use was 41.7% and the prevalence of harmful alcohol use was 14.0% among respondents with at least one ACE. Several studies have indicated that the prevalence of harmful alcohol use and alcoholism is related to childhood abuse or household dysfunction *(3,14,49,51,78,103,104,109)*. In our study, the prevalence of alcohol use and harmful alcohol use increases parallel to the increase in number of ACEs.

Street drug use is known to be closely related to the prevalence of childhood maltreatment *(48,50,106)*. In our study, the prevalence of drug use was 1.5% among respondents with no ACE and 6.7% among those with at least one ACE. The risk of street drugs use increases by 9.69 times in individuals with at least four ACEs. Other European ACE studies indicate a similar relationship *(77,79)*.

10.5 Health outcomes

Several studies have suggested a clear relationship between ACEs and health risk behaviours and health consequences in adulthood *(3,12,14,21,49,59)*. The most comprehensive and broadest study in this area was ACE 1998 *(12)*. This was followed by other ACE studies using similar questionnaires and evaluation criteria. Studies targeting older populations are more able to study and find associations between ACEs and adverse health outcomes.Given that our study population comprises younger adults, data concerning diseases which occur at more advanced ages, such as cancer, ischemic health disease, and type II diabetes mellitus, are lacking.

In our study, the major health outcomes related to ACEs include emotional problems and symptoms. Crying spells, depression and uncontrolled anger increase in association with an increased number of ACEs. Many previous studies have shown that individuals with a history of child maltreatment or household dysfunction develop serious problems including psychiatric symptoms and depression at adult ages *(47–49,51,59,71,75,104)*. Similarly, depression was the most common health problem in England and Romania ACE study which also targeted young adults *(53,77)*. These results suggest that certain emotional problems manifest earlier in life before older age.

In our study, headache was the most common cerebrovascular complaint. Cerebrovascular symptoms such as hypertension, seizures, convulsions, fits, loss of consciousness and temporarily lost control of hand or foot had a significantly higher prevalence among respondents with more than one ACE. The relationship between cerebrovascular problems and history of ACE has been indicated in previous studies *(3,14,46,52)*. These symptoms may not yet be manifest in our young study population. However, these symptoms may occur before older age among individuals with a history of ACE who are exposed to high levels of stress.

ACEs are known to be related to a number of gastrointestinal complaints *(3,12,14,21,49,52, 59)*. In our study, the most common symptoms related to ACEs included functional gastrointestinal problems such as dyspeptic complaints, constipation and frequent diarrhoea. The significant impact of childhood stress is highlighted by the occurrence of these complaints which may be considered as psychosomatic problems and there is an increased risk of prevalence of these with increasing number of ACEs.

Tiredness is another frequent health problem among respondents with a history of ACE. The prevalence of tiredness, worry about being ill or perception of poor health was higher among individuals with higher ACE scores. Nevertheless, problems which were indicated to

be ACEs in previous studies including backache, abdominal ulcer, abdominal pain and venereal diseases were higher in prevalence among individuals with at least four ACEs.

There are studies which suggest that cumulative childhood stress is related to adulthood autoimmune diseases *(21,55)*. Our study suggested no relationship between thyroid diseases which have an autoimmune component and history of ACEs. However, the prevalence of dermatological problems such as eczema was high.

All these health outcomes clearly indicate a relationship between the history of ACE and health problems. Moreover, the risk of prevalence of health problems increases together with the increase in the number of ACE categories, a cause of childhood stress. This finding is important in that interventions should start from earlier ages as these results pertain to young adults *(94,110)*. Cohort study designs are needed to elucidate the full impact of ACEs on physical, mental and reproductive health outcomes.

10.6 Problem areas

A striking finding of the study is the relationship between current problem areas of respondents and ACEs. Respondents with ACE history have deteriorated household relationships and parental-child bonding is adversely affected *(3,71)*. Families have an important role in the treatment and rehabilitation of health problems which are the outcomes of ACEs *(45,46)*. The family is a source of support for the child in mitigating the impact of domestic problems and stress and contributing to the rehabilitation process. However, continuous household problems in addition to the existing stress will certainly hamper or delay treatment and rehabilitation. Therefore, efforts to highlight the importance of the family and family support would be useful.

Respondents with a history of ACE also reported financial problems. These problems could also be the cause or outcome *(3,14,49)*. Poverty is an important childhood stress factor. Therefore, the current financial problems of respondents may be a triggering factor for ACEs. Whether this problem is a cause or outcome should be the subject of in-depth qualitative studies.

ACEs are known to lead to various biological and psychosocial outcomes which also affect academic achievement *(3,49,103)*. As expected, ACEs were linked to reported academic problems. This result highlights the need for investing in better family and school environments to provide supportive settings for the prevention of adversity in childhood and to support the process of rehabilitation.

11. Conclusions

This survey was conducted in order to identify the prevalence of ACEs in a group of university students in Turkey and examine the association between the history of ACEs and health risk behaviours and certain health consequences. The descriptive cross-sectional study used the methodology recommended by WHO/CDC. This ACE study looked into the prevalence of various forms of child maltreatment and household dysfunction. The survey was implemented in 2012–2013 on 2 257 students from five different universities in Turkey.

The findings indicate a high prevalence of ACEs in Turkey. Health risk behaviours are more common among individuals with a history of ACEs. The prevalence of certain emotional and somatic problems was higher among respondents with a history of ACEs.

According to the results, almost half of the respondents reported at least one ACE category. Physical abuse was the most common form of maltreatment in the study population. Nearly 20% of respondents reported exposure to childhood physical abuse. Physical abuse is followed by emotional abuse (9.8%) and emotional neglect (8.8%). Overall, the prevalence of sexual abuse was 7.9%. The prevalence of physical neglect is the lowest (5.7%).

Under household dysfunction, the most common problem was domestic violence. Among the respondents, 18.4% reported exposure to domestic violence. The second dysfunction of the highest prevalence was a household member imprisoned or involved in crime (10.3%). This is followed by depression or suicide attempt in the household (9.3%), harmful alcohol use in the household (6.4%), separated parents (5.2%), and a household member using street drugs (3,4%).

The prevalence of physical abuse was the highest in all ACEs, followed by exposure to domestic violence across all ACEs in both categories. The prevalence of co-occurring ACEs was also high. In particular, three out of four respondents who were physically abused or exposed to domestic violence have a history of another ACE.

The prevalence of physical abuse, emotional neglect, and physical neglect was higher among male respondents. There is no gender difference in sexual abuse and emotional abuse. However, the prevalence and the number of categories were higher among males in general.

As regards the relationship between the sociodemographic characteristics of respondents and ACE prevalence, the prevalence is significantly lower among respondents from nuclear families. The ACE score increases in parallel to the increased number of siblings and lower parental educational status. Known risks of child maltreatment include crowded families and low levels of parental education *(1,3,4)*. The impact of these factors is evident in our study.

A second aim of the study was to indicate the relationship between ACEs and health risk behaviours among the respondents. According to the data, the prevalence of health risk

behaviours was higher among respondents who were abused or exposed to other household problems. The risk of street drug use increases the most among respondents with a history ACE. The risk of street drug use of individuals with one ACE increases by 2.83 times compared to respondents without a history of ACE. The risk increases up to 9.69 times depending on the increase in the number of ACEs to which the respondent had been exposed to as a child. A similar increase is observed in the case of harmful alcohol use and smoking. A history of one ACE increases the risk of harmful alcohol by 2.14 and smoking risk by 1.54 times; a history of 4+ ACEs increases the risks by 4.46 and 3.41 times, respectively. This parallel increase in health risk behaviours and the number of ACE categories matches the findings of previous studies.

The great majority (95%) of the respondents are young adults aged 18–23. The outcomes of health risk behaviours are not usually manifest in this young age group. However, the childhood trauma may lead to stress response disorder and certain neurobiological changes *(20)*. These changes may result in emotional, behavioural and cognitive impairment. The association between ACEs and various somatic findings and complaints has been previously described *(6,16,19,20,67–69)*. The most common emotional problems our study found include nervousness, panic, crying spells, depression, uncontrolled anger, high stress levels, and trouble refusing requests. The risk of prevalence of emotional problems increases by 6–8 times parallel to the increase in the number of ACE categories. Furthermore, gastrointestinal symptoms such as dyspepsia, frequent diarrhoea, and constipation increase by 2.23–4.63 times together with the increase in the number of ACE categories. The prevalence of headaches and tiredness is higher among respondents with a history of ACE, and the perception of poor health and worry about being ill increases particularly among respondents with high ACE scores.

Families have a significant role to play in children's exposure to ACEs. Household members may be directly responsible for physical and emotional abuse and neglect and whereas others cause ACEs indirectly as in cases of household dysfunction. Moreover, the failure of the family to properly support the child makes it difficult for the child to cope with adverse experiences. In this regard, the relationship between children with ACEs and their families is important. In our study, the prevalence of household problems was high among respondents with ACEs. The risk of prevalence increases by 2.66–29.10 times depending on the increase in the number of ACE categories.

Some of the respondents also had financial problems. The prevalence of financial problems is higher among participants with a history of ACEs and the risk of prevalence increases by 2.32–9.40 times together with the increase in the number of ACE categories. Similarly, respondents with ACEs were more likely to have problems at school.

The study suggests that ACE prevalence is high in a group of young adults in Turkey and that these individuals have a higher prevalence of health risk behaviours and certain health

problems particularly including emotional problems. The findings are similar to those of other studies on child maltreatment, ACEs and impacts. However, the purpose of this study is not to re-display the evidence but to contribute to the debate on preventing child maltreatment and other ACEs. The data from this study provides information about the magnitude of the problem in the country and provides evidence for the need to prioritize child maltreatment.

11.1 Limitations of the study

1. The main limitation of this study is the small size of the sample which is not representative of the young people in Turkey. The number of inhabitants aged 18–23 is nearly 7.5 million as of 2013 *(111)*. Currently, Turkey has 192 universities with 4 975 690 students *(112,113)*. A sample size of 13 792 is needed in order to represent approximately 5 million people). However, this sample size was not targeted as the aim of the study was to detect ACEs and test their associations.

2. The study covered students that have attained a certain level of academic achievement. Considering that these young people have access to education, one could assume that they possess the necessary means related to family, sociocultural environment, socioeconomic matters and sufficient mental capacity. Individuals who cannot attend university are more likely to have ACEs. Therefore, the sample represents a lower ACE risk group.

3. The risk of recall bias is high as the study was implemented in the form of a questionnaire and childhood experiences were inquired. Some of these are adverse experiences which the respondent may not wish to recall. However, the best recalled memories often pertain to experiences with the highest impact. Therefore, it is likely that participants have not recalled all adverse experiences with different levels of impact in childhood and that the responses do not sufficiently reflect the situation. Moreover, information concerning the experienced traumas or stress factors pertains only to ages respondents were able to remember. Therefore, our study results cannot be generalised to the whole population.

4. In particular, questions about comprehensive forms emotional abuse such as emotional abuse and neglect are insufficient in number and content to reflect the real situation.

5. The response rate was especially low in questions about sexual abuse. This indicates that respondents avoided answering questions about sexual abuse. These points should be remembered when the results are evaluated.

6. Information about the health status of respondents are solely based on self-report and thus cannot be deemed definitive about the real status. Furthermore, longitudinal follow-up studies are needed to evaluate the impact of health risk behaviours and the studies should be supported by routine health follow-ups and analysis of health records.

12. Recommendations

Child maltreatment and other ACEs constitute a public health concern as they affect the health of the child and produce lifelong consequences. This problem is not limited to Turkey or this region. Although the prevalence may vary, child maltreatment concerns the whole world as it potentially threatens the social structure. Therefore, the recommendations for solutions should be based on comprehensive assessments and the number of local studies should be increased.

12.1 Developing a national action plan

A national action plan needs to be developed on the prevention of all forms of violence against children and safeguarding a secure, safe and nurturing living environment for them. The structure of the plan should allow for programmes involving the health, judiciary, social services, education and security sectors, and for coordination and cooperation among the legislators, decision-makers, service providers, researchers, and bodies in charge of developing and implementing education and service programs *(3,4,9)*. Such a plan should include prevention programmes that highlight who should do what and with what resources.

The plan should cover an analysis of current situation, design and implementation of protective and preventive measures, improvement of existing processes, treatment and rehabilitation services, and the monitoring and evaluation of preventive programmes and services.

12.1.1 Surveillance and monitoring

A study for the identification of the magnitude of the problem and risk areas is the first step to solution. At present, Turkey lacks studies with a representative sample size of the whole child population in the country. On the other hand, local studies including ours suffice to give an idea about the magnitude of the problem. Therefore, it would be appropriate to give priority to quantitative surveys to identify risks, causes and consequences at local level for the sake of effective and efficient use of means and resources. Furthermore ACE studies using a similar methodology need to be repeated in order to determine whether the problem is changing and to monitor preventive programmes.The risk factors of childhood maltreatment are well known in general. However, local studies may help identify which risk areas amplify the problem at local level.

12.1.2 Studies

Studies on the neurobiological, somatic and all other effects of child maltreatment and solutions for the problems need to be supported. In addition, monitoring and evaluation studies are needed to evaluate the effectiveness of protective and preventive programmes. Studies in this area should be supported the resulting information should be used to develop new services.

12.1.3 Prevention programmes

There is a growing evidence base of prevention programmes that prevent maltreatment from occurring inthe first place and which have evidence of cost-effectiveness*(1,3)*. As part of a coordinated public health and inter-sectoral response, prevention programmes need to be developed and implemented using the existing evidence base. These include nurse family partnerships, positive parenting programmes, hospital based programmes to reduce abusive head trauma, legislation and social marketing campaigns to stop the use of corporal punishment to disciple children, and targeted community and welfare programmes supporting families at risk. Awareness raising and information activities to protect children from maltreatment and other forms of abuse are needed within the scope of primary prevention. These activities and education activities need to be based on child rights and focus on protecting children from abuse and neglect, creating a safe environment for children, preventing violence, effective and appropriate disciplinary practices, prevention of health risk behaviours, and prevention of domestic violence. *(3,94,110)*.

12.1.4 Protective measures and practices

In addition to community education activities, secondary prevention involving preventive and protective activities for groups at risk should be considered. These activities may include targeted household visits to empower families based on risk groups and identified risks, child monitoring programs, school activities, anger control activities, and programs for preventing substance dependence. Furthermore, in-service trainings to improve knowledge and skills of professionals in the areas of health, judiciary, social services, education, and security would improve quality of services *(85,86,114–118)*. In addition, activities aiming at protecting children with adverse experiences from other ACEs, particularly including tertiary prevention and protecting peers of children exposed to violence, need to be carried out.

12.1.5 Treatment and rehabilitation activities

The lifelong effects of ACEs can be minimized through treatment and rehabilitation. To that end, specialized personnel should be trained and treatment and rehabilitation models should be developed *(3,116,117,119–121)*. In addition, child friendly treatment and rehabilitation centres should be scaled up and accessibility of services should be enhanced.
Centres for the prevention and treatment of substance dependence should be scaled up and supported with experienced specialists and resources in order to increase accessibility of services *(88)*.

12.1.6 Process improvement

A multidisciplinary approach is needed for the prevention of secondary victimhood of abused or traumatized children during the legal process. Child monitoring centres and similar institutions need to be strengthened and scaled up *(88,122–124)*. These centres

should have a system for monitoring children throughout the whole process and not only at the legal phase and it should be capable of referring children for care and rehabilitation.

Counselling centres specialized in the prevention of domestic violence need to be established. Moreover, systems and structures which protect women and children who are the victims of violence should be developed.This includes improving the occupational skills of women to support themselves when the family is disintegrated *(3,9,88,122)*.

Family and youth counsellingcentres specialized in the prevention of risk behaviours should be established to inform families and young people and carry out preventive work.

A comprehensive, effective and secure recording system which respects confidentiality of private data should be developed at national level and it should be used by all institutions involved in diagnosis, treatment and follow-up services for children maltreated or otherwise abused *(3,88).*

12.2 International and multisectoral approach to the problem

TheWHO European policy for health and well-being, Health 2020 highlights the underlying principle of equity, and using evidence informed multisectoral interventions across the life course and hence recognizes the importance of investing in early childhood development and preventing child maltreatment *(125)*. Several international activities are conducted for ensuring the safety and security of children and prevention of ACEs. Exchange of knowledge and adapting to local contexts by taking account of local differences and risks would accelerate the development of national models. Furthermore, achievements and weaknesses can be exchanged to contribute to the solution at global level.

Multisectoral efforts at national and international level can make the stakeholders of the problem a part of the solution. The security, safety and wellbeing of children is not the sole responsibility of families and public institutions; coordination across universities, civil society organizations and specialized international organizations are needed so to elaborate and implement short-, medium- and long-term plans. In addition, an independent monitoring system for evaluating all education activities and quality of services would both indicate the outcomes and provide input for the next steps.

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Annex 1

QUESTIONNAIRE ON DETERMINING NEGATIVE CHILDHOOD EXPERIENCES
Questionnaire no: ……..
QUESTIONS ABOUT SOME SOCIODEMOGRAPHIC CHARACTERISTICS

1. How old are you? _____

2. What is your gender? □ Male □ Female

3. Where were you born?
   1) Province
   2) District
   3) Town

4. Among the below choices, in which residential area did you live for the longest period until the end of the age of18?
   1) Province (indicate its name)……
   2) District
   3) Village

5. What is your marital status?
   1) Single
   2) Married
   3) Divorced
   4) Widow/widower

6. Please indicate your current place of residence.
   1. State dormitory
   2. Private dormitory
   3. Alone in the house
   4. In the house with parents-siblings
   5. In the house with siblings
   6. In the house with friends
   7. In the house with relatives
   8. Guesthouse of an institution or association
   9. Other (explain).....

7. How many siblings do you have?
   1) I don't have siblings
   2) ..... sibling(s). Age(s): …… …… …… …… …….

8.<u>During your childhood i.e. before you were 18-year-old,</u> did you continuously live with your family (your parents)?

   1) Yes
   2) No (If you lived in another place <u>for more than 6 months</u>, please indicate one by one for how long and where/) …….. year(s), with…….. year(s), with…….

9. To which of the below does your family type correspond?

1) Nuclear family (the family in which you live with your mother, father and/or siblings)
2) Extended family (the family in which you live with your mother, father, siblings, grandmother, grandfather and other first degree relatives)
3) Other (explain.....)

10. When you were born, how old was your mother? Age _____ -year-old.

11. Indicate the educational status of your mother and father. Tick the related box with (x).

Educational status	Mother	Father
Illiterate		
Literate		
Primary school graduate		
Secondary school graduate		
High school graduate		
University-college graduate		

12. Please indicate whether your mother had a job that brought in financial gain <u>when you were younger than 18</u>.

1) She did not have a job.
2) Yes, she had a job (indicate what her job was.....).
3) She was retired

13. Please indicate whether your father had a job that brought in financial gain <u>when you were younger than 18</u>.

1) He did not have a job.
2) Yes, he had a job (indicate what his job was.....).
3) He was retired

14. Who was taking care of you during your pre-school years?

□ One of my parents
□ A second degree relative
□ A distant second degree relative
□ A babysitter who was not a relative
□ Kindergarten or day care centre
□ Other_____

15. Did you stay at a boarding school or dormitory before you were 18?

□Yes (if yes, between the ages: …….-……) □No

DURING THE FIRST 18 YEARS OF YOUR LIFE:

16. Did your father smoke? □ Yes □ No
17. Did your mother smoke? □ Yes □ No

18. For a period of time, did you share the same house with a person who had alcohol problem or who was an alcoholic?

□ No

□ Yes Please indicate below who she/he was/they were:

□ Mother □ Father □ Sister □ Brother

□Other relatives □ People who were not relatives (Acquaintances)

19. For a period of time, did you share the same house with a drug addict?
□ No □ Yes

20. Are your parents divorced or ever separated? □ Yes □ No

21. Have you ever lived with your step-father? □ Yes □ No

22. Have you ever lived with your step-mother? □ Yes □ No

23. Have you ever lived at an institution that provides nursing? □ Yes □ No

24. Have you stayed out your house for more than a day? □ Yes □ No

25. Have your siblings run away from the house and stayed out for more than a day?
□ Yes □ No

26. Does anyone in your family have mental disease? □ Yes □ No

27. Has anyone in your family attempted to commit suicide? □ Yes □ No

28. Has anyone in your family imprisoned? □ Yes □ No

29. Has anyone in your family involved in crime? □ Yes □ No

30. How many of your intimate friends, do you think, would help you when you need or when you have an emotional problem? …….. friend(s)

SOME QUESTIONS ABOUT NEGATIVE EXPERIENCES

31. Below please find some types of behaviour which can be encountered in man-woman relationships. During the period when you were younger than 18, did you witness any of the below behaviours between your parents? About each type of behaviour, please tick the most appropriate choice for you with (X).

Type of behaviour	Never	Once or twice	Sometimes	Frequently	Very frequently
a. Hustling, slapping or throwing an object at him/her					
b. Kicking, biting, punching or hitting with a hard object					
c. Repeatedly hitting for a few minutes					
d. Threatening with a knife or weapon, using a knife or weapon to injure him/her					

32. By taking the period during which you were younger than 18 into consideration, among the below definitions, please tick the appropriate choice for you with (X).

	Never	Rarely True	Sometimes True	Frequently True	Very Frequently True
a.We did not have enough food					
b. I knew that there was someone who would take care of me					
c. For me, my family members used adjectives that possess negative features like “ugly”, “lazy”, “dumb”, and “clumsy”					
d. There was one person in my family who made me feel important or special					
e. I had to wear dirty clothes					
f. I felt I was being loved					
g. I used to think that my parents wished that I had never been born					
h. My family members cared for and supported each other					
i.I used to think that someone in my family hated me					
j. My family members said hurting and insulting words to me					
k.There was a feeling of intimacy among my family members					
l.There was someone who would take me to a doctor when I needed					
m.For me, my family was a source of power and support					

33. Sometimes children can be exposed to offending behaviours of their parents or other adults. Below please find some of these behaviours. Please by regarding the period before the age of 18, select the most appropriate choice about being exposed to these behaviours by marking with (X).

Type of behaviour	**Never**	**Once or twice**	**Sometimes**	**Frequently**	**Very frequently**
a.Swearing or insulting					
b.Hitting and throwing an object or hitting and threatening with throwing an object					
c.Hustling or slapping					
d.Hitting severely to leave a mark or to injure					

34. Before the age of 18, some people could have been forced to have sexual experience with a person who was at least 5 years older than them or who was an adult. This experience could have been had with a relative, a friend or a stranger. The below questions are about this subject; you are free to reject answering them if you do not want to answer. However, your answers are going to be important for the outcomes of this research.

When you were younger than 18, did an adult or a person who was at least 5 years older than you ……		If your answer is yes how old were you when that first happened?	If your answer is yes how old were you when that happened for the last time?	How many times did it happen?	How many different people did that?	What was the gender of this person/ these people?
a. Touch or caress your body sexually?	□ Yes □ No	Age……..	Age……..	…… times	Nb. of people……	□ Female □ Male □ Both
b. Did you touch his/her body sexually?	□ Yes □ No	Age……..	Age……..	…… times	Nb. of people……	□ Female □ Male □ Both
c. Attempt to have sexual intercourse with you? (Oral, vaginal, anal)	□ Yes □ No	Age……..	Age……..	…… times	Nb. of people……	□ Female □ Male □ Both
d. Have any kind of sexual intercourse with you? (Oral, vaginal, anal)	□ Yes □ No	Age……..	Age……..	…… times	Nb. of people……	□ Female □ Male □ Both

35. If in Question 34, your answer to at least one of the choices is "yes" (*You can choose more than one item*):

This person\people……..	Yes	No
Was a relative living in your house?		
Was a person who was living in your house and who was not a relative?		
Was a relative who was not living in your house?		
Was someone you knew who and was not living in your house?		
Was a stranger?		
Was someone who was considered to be taking care of you (like the babysitter)?		
Was someone you trusted?		

36. Before the age of 18, were you exposed to any type of violence which is not referred to among the questions asked within the scope of this questionnaire (Please answer by indicating its type– *You can choose more than one item.*)?

1. No, I was not exposed to violence.
2. Yes, I was exposed to physical violence.
3. Yes, I was exposed to verbal violence.
4. Yes, I was exposed to sexual violence.
5. Yes, other (Explain……)

37. If one of your answers given to this questionnaire's questions about being exposed to violence is yes, have you shared that experience with someone else?

1. I was not exposed to violence.
2. I did not share.
3. I shared it with my friends.
4. I shared it with my family.
5. I notified it to the related authority.
6. I received professional support.

Health Appraisal Questionnaire

38. Have you ever been a smoker □ Yes □ No

39. If now a smoker how many cigarettes a day .....

40. Did you consume alcohol**?** □ Yes □ No

41. If you consume alcohol, what is its frequency?

1) Everyday
2) A couple of days in a week
3) A couple of days in a month
4) Rarely

42. Have you ever had, or ever been told you have:

	Yes	No
a. High blood pressure		
b. To take blood pressure medicine		
c. An ulcer		
d. Vomited blood		

43. Are you troubled by:

	Yes	No
a. Abdominal (stomach) pains		
b. Frequent indigestion or heartburn		
c. Constipation		
d. Frequent diarrhoea, loose bowels		
e. Frequent headaches		
f. Attacks of dizziness		
g. Frequent back pain		
h. Frequently worried about being ill		
i. Been troubled as a result of being more sensitive than most people		
j. Had special circumstances in which you find yourself panicked		
k. Had reason to fear your anger getting out of control		

44. Have you ever:

	Yes	No
a. Had seizures, convulsions, fits		
b. Fainted or lost consciousness for no obvious reason		
c. Temporarily lost control of a hand or foot (paralysis)		

45. Have you ever been treated for or told you had:

	Yes	No
a. Any venereal disease		
b. Thyroid disease		
c. Eczema (skin problem with rush and peeling)		

46. Have you ever been treated for or had:

	Yes	No
a. Trouble refusing requests or saying "No"		
b. Trouble falling asleep or staying asleep		
c. Tiredness, even after a good night's sleep		
d. Crying spells		
e. Depression or "feel down in the dumps"		
f. Much trouble with nervousness		
g. Sometimes drink more than is good for you		
h. Use street drugs		

47. Are you:

	Yes	No
a. Currently sexually active with a partner		
b. Satisfied with your sex life		
c. Concerned you are at risk for AIDS		

48. Are you now having serious or disturbing problems with your:

	Yes	No
a. Family		
b. School		
c. Financial matters		
d. Drug usage		

49. Are there any unusual illnesses in your family you didn't list previously?
□ Yes □ No

50. Please fill in the circle that you think best describes your current state of health

1) excellent
2) good
3) fair
4) poor

51. Please fill in the circle that best describes your stress level

1) high
2) medium
3) low

52. In the past year, about how many visits to a doctor have you made? .....

53. Do you regularly use seat belts in a car? □ Yes □ No

Annex 2

Frequency tables of child maltreatment and householddysfunction parameters (Table A2.1–Table A2.10).

Table A2.1. Prevalence of childhood physical violence by sex

Conditions	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
1. Hitting and throwing an object or hitting and threatening with throwing an object	203/1063	19.1	128/1165	11.0	331/2228	14.9
2. Hustling or slapping	168/1082	15.5	103/1175	8.8	271/2257	12.0
3. Hitting severely to leave a mark or to injure	127/1082	11.7	92/1175	7.8	219/2257	9.7
Physical Abuse (1 or 2 or 3)	283/1080	26.2*	192/1175	16.3*	475/2255	21.1*

ap/n : number of responses deemed affirmative/number of respondents who answered the question.
*P<0.001

Table A2.2. Prevalence of child sexual abuse by sex

Questions	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
1. Touch or caress your body sexually?	57/904	6.3	73/1017	7.2	130/1921	6.8
2. Did you touch his/her body sexually?	52/897	5.8	7/1014	0.7	59/1911	3.1
3. Attempt to have sexual intercourse with you? (Oral, vaginal, anal)	33/893	3.7	11/1016	1.1	44/1909	2.3
4. Have any kind of sexual intercourse with you? (Oral, vaginal, anal)	23/893	2.6	6/1016	0.6	29/1909	1.5
Sexual Abuse (at least one type)	78/901	8.7	73/1017	7.2	151/1918	7.9

[a]p/n : number of responses deemed affirmative/number of respondents who answered the question.

Table A2.3. Prevalence of emotional abuse by sex

Conditions	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
1. For me, my family members used adjectives that possess negative features like "ugly", "lazy", "dumb", and "clumsy"	39/1072	3.6	31/1154	2.7	70/2226	3.1
2. I used to think that my parents wished that I had never been born	31/1065	2.9	37/1157	3.2	68/2222	3.1
3. My family members said hurting and insulting words to me	41/1069	3.8	42/1150	3.7	83/2219	3.7
4. Being expose to swearing or insulting	47/1067	4.4	31/1167	2.7	78/2234	3.5
Emotional Abuse (1 or 2 or 3 or 4)[b]	112/1050	10.7	102/1140	8.9	214/2190	9.8

[a]p/n : number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square*P*>0.05

Table A2.4. Prevalence of physical neglect by sex

Conditions	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
1. We did not have enough food	34/1066	3.2	28/1134	2.5	62/2200	2.8
2. I had to wear dirty clothes	48/1058	4.5	26/1149	2.3	74/2207	3.4
Physical neglect (1 or 2)[b]	73/1050	7.0*	52/1126	4.6*	125/2176	5.7*

[a]p/n : number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square*P*<0.05; *P<0.05

Table A2.5. Exposure to domestic violence by sex

Conditions	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
1. Hustling, slapping or throwing an object at him/her	190/1067	17.8	150/1163	12.9	340/2230	15.2
2. Kicking, biting, punching or hitting with a hard object	60/1047	5.7	57/1133	5.0	117/2180	5.4
3. Repeatedly hitting for a few minutes	116/108	11.1	95/1129	8.4	211/2177	9.7
4. Threatening with a knife or weapon, using a knife or weapon to injure him/her	30/1047	2.9	29/1133	2.6	59/2180	2.7
Exposure to domestic violence (1 or 2 or 3 or 4)[b]	220/1051	20.9*	183/1139	16.1*	403/2190	18.4*

[a]p/n : number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square*P*<0.01, *P<0.01

Table A2.6. Prevalence of separated or divorced parents by sex

Condition	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
Separated or divorced parents[b]	53/1072	4.9	63/1172	5.4	116/2244	5.2

[a]p/n : number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square

Table A2.7. Depression or suicide attempt in the family by sex

Questions	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
1. Does anyone in your family have mental disease?	51/1078	4.7	83/1171	7.1	134/2249	6.0
2. Has anyone in your family attempted to commit suicide?	41/1078	3.8	70/1172	6.0	111/2250	4.9
Depressed or suicidal household member(1 or 2)[b]	77/1077	7.1*	132/1170	11.3*	209/2247	9.3*

[a]p/n : number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square; *P<0.001

Table A2.8. Prevalence of a problem alcohol drinker in the house by sex

Question	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
Problem alcohol use by household member[b]	81/1075	7.5*	62/1172	5.3*	143/2247	6.4*

[a]p/n : number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square; *P<0.05

Table A2.9. Prevalence of street drug use in house by a household member by respondents' sex

Question	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
Street drug use by household member[b]	52/1077	4.8*	24/1173	2.0*	76/2250	3.4*

[a]p/n :number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square; *P<0.001

Table A2.10. Household member involved in crime or imprisoned by respondents' sex

Questions	Male		Female		Total	
	p/n[a]	%	p/n[a]	%	p/n[a]	%
1. Has anyone in your family imprisoned?	108/1079	10.0	84/1170	7.2	192/2249	8.5
2. Has anyone in your family been involved in crime?	84/1078	7.8	56/1172	4.8	140/2250	6.2
Household member involved in crime or imprisoned (1 or 2)[b]	130/1079	12.0; *	102/1170	8.7; *	232/2249	10.3; *

[a]p/n :number of responses deemed affirmative/number of respondents who answered the question.
[b]Pearson Chi-Square; **P*<0.01

Annex 3

Distribution of health problems according to gender may be seen in Tables A3.1 to Table A3.5.

Table A3.1. Distribution of emotional problems by gender

Emotional problems	Male N - %	Female N - %	Total N - %
To be panicked in special circumstances* **	310-39.3%	460-51.5%	770-45.8%
Uncontrolled anger* **	252-31.8%	204-23.0%	456-27.2%
Nervousness*	377-47.5%	485-53.2%	862-50.6%
Depression* **	237-30.0%	379-41.7%	616-36.3%
Crying spells* **	46-5.8%	227-25.3%	273-16.2%
Sleep problems	231-29.1%	297-32.8%	528-31.1%
More sensitive than most people* **	256-32.6%	391-43.9%	647-38.6%
Trouble refusing requests	290-36.4%	340-37.6%	630-37.0%
High stress level**	171-21.2%	262-28.4%	433-25.0%

* *P*<0.05, ** *P*<0.01, *** *P*<0.001,

Table A3.2. Distribution of cerebrovascular problems by gender

Symptoms	Male N - %	Female N - %	Total N - %
High blood pressure**	53-7.1%	28-3.5%	81-5.2%
Frequent headaches* **	200-25.5%	359-40.4%	559-33.4%
Attacks of dizziness**	106-13.6%	172-19.6%	278-16.8
Seizures, convulsions,fits	31-3.9%	42-4.6%	73-4.3%
Loss of consciousness**	43-5.4%	86-9.5%	129-7.6%
Temporarily lost control of hand or foot**	50-6.3%	89-9.8%	139-8.2%

* *P*<0.05, ** *P*<0.01, *** *P*<0.001

Table A3.3. Distribution of gastrointestinal problems by gender

Symptoms	Male N - %	Female N - %	Total N - %
Stomach ulcer* **	46-6.1%	103-12.4%	149-9.4%
Vomited blood	8-1.1%	5-0.6%	13-0.8%
Abdominal (stomach) pains* **	205-26.0%	434-48.7%	639-38.0%
Frequent indigestion or heartburn **	159-20.3%	230-26.2%	389-23.4%
Constipation* **	91-11.7%	263-29.8%	354-21.3%
Frequent diarrhoea	76-9.7%	80-9.3%	156-9.5%

* *P*<0.05, ** *P*<0.01, *** *P*<0.001

Table A3.4. Distribution of nonspecific health problems by gender

Complaint or symptoms	Male N - %	Female N - %	Total N - %
Frequent back pain* **	172-21.9%	308-35.0%	480-28.8%
Thyroid disease* **	12-1.5%	43-4.8%	55-3.2%
Eczema* **	51-6.4%	109-12.1%	160-9.4%
Venereal disease*	11-1.4%	4-0.4%	15-0.9%

* *P*<0.05, ** *P*<0.01, *** *P*<0.001

Table A3.5. Perception of respondents about general health status by gender

Health perception	Male N - %	Female N - %	Total N - %
Tiredness **	337-42.6%	446-49.2%	783-46.1%
Worried about being ill*	164-21.1%	220-25.5%	384-23.4%
Poor health status	20-2.4%	15-1.6%	35-2.0%

* *P*<0.05, ** *P*<0.01, *** *P*<0.001

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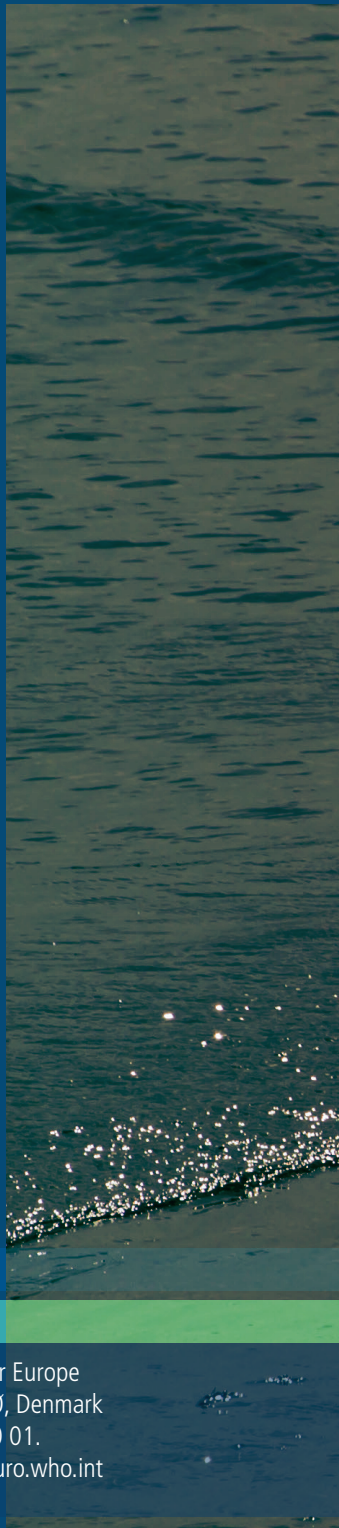

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