

Emotional and experiential factors that determine civilizational diseases

BACKGROUND

The effects of adverse childhood experiences may persist in adult life and manifest themselves in various areas of functioning. The aim of the study was to identify the emotional and experiential factors that determine civilizational diseases and the methods of regulating emotions and functioning in society.

PARTICIPANTS AND PROCEDURE

The surveyed group was composed of 141 adults. The respondents defined the existence of adverse experiences and their attachment styles in retrospective. The methods of regulating emotions were also measured, as well as the presence of civilizational diseases.

RESULTS

The authors found a correlation between the style of attachment and the traumatic events experienced during the first 18 years of life and the existence of civilizational diseases. Adverse experiences in childhood and attachment styles proved to be predictors of specific social behaviour aimed at regulating emotions.

CONCLUSIONS

The results emphasised the importance of the bond with a parent and of traumatic childhood experiences for the

future health condition and for the social and emotional functioning. The study demonstrated that persons who experienced traumatic events in their families or in the peer environment in the first 18 years of their lives reported the presence of civilizational diseases. A correlation was found between peer violence, the threat of being abandoned by a caregiver, and diagnosed civilizational diseases in respondents. The fearful-ambivalent style in the relationship with the father proved to be a predictor of reported civilizational diseases. Adverse childhood experiences are linked to regulating emotions by taking perspective. The attachment style developed in the relationship with parents determined the ways of regulating negative and positive emotions in contact with other people. Persons who developed an avoidant attachment style in the relationships with the mother or the father less frequently seek social support when they experience negative emotions.

KEY WORDS

adverse childhood experiences; ACE; attachment; civilizational diseases; emotion regulation

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BACKGROUND

Researchers have been increasingly interested in the correlation between early childhood experiences and the health condition of adults since the 1990s. These traumatic experiences may be identified and analysed using the Adverse Childhood Experiences (ACE) scale, developed by the Centers for Disease Control and Prevention (CDC) and the Kaiser Permanente organisation (Petruccioli et al., 2019). The scale measures the number of negative childhood experiences, which include, among others: experiencing violence, emotional neglect, exposure to the use of violence by the caregivers and the closest relatives, unstable living conditions, mental illness, and divorce of parents (Finkelhor et al., 2015). Numerous studies on adverse childhood experiences (ACE) have revealed that they have a direct, long-term influence on the physical and mental health and on the social functioning of individuals in adult life. Felitti et al. (1998) demonstrated a correlation between traumatic childhood experiences and numerous diseases and types of unhealthy behaviour. The risk of alcoholism, drug addiction, smoking tobacco, negative health assessment, sexually transmitted diseases, depression and suicide attempts, lack of physical activity and morbid obesity was much higher in persons who were exposed to four or more traumatic situations in their childhood than in those who did not experience any such situations. The same study also demonstrated the link between ACE and ischaemic heart disease, cancer, chronic bronchitis and chronic obstructive pulmonary disease (COPD; Felitti et al., 1998). Further research confirmed the link between adverse childhood experiences and the development of somatic diseases and dysfunctions in adulthood and expanded the research perspective by further diseases and correlations between ACE and health status. The review of 40 publications showed a correlation between the experiences of violence, neglect, or exposure to violence in childhood and cardiovascular diseases in 91.7% of the studies, type 2 diabetes in 88.2% of the studies and with hypertension in 61.5% of the studies (Archana et al., 2017). On the other hand, Dong et al. (2003) demonstrated that each of the 10 categories of ACE (emotional abuse, physical abuse, sexual abuse, emotional and physical neglect, mother treated violently, mental illness or substance abuse in the household, parental separation or divorce, and criminal household member) increased the risk of liver disease. Moreover, the risk of illness increased with the number of negative experiences from the past of the respondent. The factor that mediated the connection between ACE and the risk of liver disease was involvement in risky behaviours, i.e. injecting drugs or alcohol abuse (Dong et al., 2003). The correlation between specific childhood experiences and being diagnosed with cancer in adult life has also been con-

firmed. Sexual abuse in childhood was linked to cervical cancer in adult women (Coker et al., 2009) and, in general, with more frequent cancer diagnoses (Coker et al., 2009). Brown et al. (2010) identified a graded relationship between ACE and smoking cigarettes and pulmonary cancer in a prospective cohort study. The analysis of the data from the Longitudinal Survey of Youth of 1979 revealed a correlation between physical abuse in childhood and obesity at the age of 40 (Rehkopf et al., 2016). Early traumatic experiences may not only increase the risk of occurrence of the disease but also influence its severity and progress. The study by Schierholz et al. (2016) linked the experience of violence or neglect in childhood with more severe cases of depression and a larger number of depression episodes during the whole life. This link was mediated by the dysregulation of emotions, a depressive style of attribution and avoiding closeness in intimate relationships (Schierholz et al., 2016). It should be noted that emotion regulation may play an important role not only in the pathogenesis of mental illnesses, but also of physical disorders. The study by Roy et al. (2018) demonstrated that the cardiovascular risk was connected to chronic stress only in persons with poor emotional regulation. Non-adaptive emotional regulation is connected with a higher level of inflammation (Appleton et al., 2013). Moreover, adverse childhood experiences are one of the predictors of difficulties with regulating the affective states (Burns et al., 2010). This points to the important, two-directional role of emotional regulation in research on correlations between childhood and the health condition of adults.

An increasing number of authors are discussing the influence of the attachment style developed in childhood on the psychological and physical functioning. Secure attachment style, although it does not guarantee mental health, provides some type of protection against psychopathology. This is possible, among other ways, by shaping positive attitudes towards oneself and other people in the child, and enabling the child to enter in close relationships and build a social support network. Forming an insecure attachment style in the relationship with the caregiver is linked to less developed social competences, lower ability to regulate one's emotions, and thus higher vulnerability to the consequences of the experienced stress (Sroufe, 2005). Early childhood attachment may also play an important role in maintaining good physical condition. Attachment theory allows us to understand better how close relationships may influence our physiology, including the immune and neuroendocrine systems (Ehrlich & Cassidy, 2019). One of the few prospective studies, conducted by Farrell et al. (2019), revealed that experiencing higher sensitivity from the mother in the first few years of life was connected to lower cardiometabolic risk over 30 years later. It turned out that the secure attach-

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ment style partly mediated this correlation. On the other hand, Puig et al. (2013) found that an insecure style of attachment in early childhood (the 12th and 18th month of life) was a predictor of health problems reported after 30 years. Individuals who reported an anxious-ambivalent or fearful-avoidant attachment style reported inflammatory diseases in adult life more frequently. These diseases included tonsillitis, ischaemic heart disease, asthma, bronchitis, COPD, diabetes, hypertension, and stroke (Puig et al., 2013).

Many of the diseases listed above are classified as lifestyle diseases, which are one of the biggest problems of modern medicine. Civilization diseases result largely from habits based on a sedentary lifestyle, unhealthy diet, disturbed circadian rhythm (Sharma, 2009), as well as smoking and alcohol consumption (Danaei et al., 2009; Sly et al., 2016). Significant risk factors also include maladaptive, chronic stress, which affects the body through biological, social and behavioural pathways (Kopp & Réthelyi, 2004; Puzserova & Bernatova, 2016). Behaviours harmful to health are classified as modifiable risk factors. In addition to factors dependent on lifestyle and individual choices, external environmental stimuli, i.e. chemicals, radiation and air pollution, are important. Exposure to them in the early stages of development can increase the risk of lifestyle diseases, which include primarily cardiovascular diseases, cancer, chronic obstructive pulmonary disease, asthma, and diseases of the musculoskeletal system (World Health Organization, 2017). Civilization diseases very often result from the interaction of genetic, behavioural and environmental or economic factors and require reference to a specific country, region and culture (Miranda et al., 2008). According to the report of the Central Statistical Office, mortality caused by civilization diseases continues to grow. Data from 2019 indicate that the most common cause of death in Poland is cardiovascular disease, which accounts for nearly 40.0% of all deaths. The next most common causes of death are cancers, which in 2019 accounted for 26.5% of all deaths, and respiratory diseases (6.6% of all deaths) (Central Statistical Office, 2020). Many studies draw attention to the relationship between adverse experiences in childhood and more frequent substance use, including smoking and alcohol consumption, as well as leading an unhealthy lifestyle (i.e. lower fruit and vegetable consumption, higher BMI, less sleep) (Fellitti et al., 1998; Rehkopf et al., 2016; Windle et al., 2018). Importantly, these factors are modifiable, so preventive and curative strategies can be applied to them (Prüss-Ustün et al., 2019). The above data and poor research literature in Poland on the relationship between early childhood experiences and the state of health of Poles prompt reflection on the potential psychological determinants of lifestyle diseases.

The aim of the study presented in this article is to broaden the knowledge about negative childhood ex-

periences and their connection with the health condition and the way of functioning in adult life. Based on the available literature, the following research questions were formulated:

- Is there a link between childhood experiences and the presence of civilizational diseases in adult life?
- Is there a correlation between the attachment style and the presence of civilizational diseases in adult life?
- Is there a link between childhood experiences and the attachment style and regulating one's emotions through contact with people?

ACE, civilization diseases and emotion regulation

PARTICIPANTS AND PROCEDURE

PARTICIPANTS

The surveyed group was composed of 141 adults: 102 women (73.0%) and 39 men (28.0%). The average age was 28.67 years ($SD = 9.75$). The largest group of respondents consisted of people with secondary education (48.2%) and higher education (47.5%). As many as 132 respondents (94.0%) mentioned at least one adverse childhood experience. Almost half of the respondents (49.6%) mentioned at least one civilizational disease. The most frequently reported diseases were depression (30.1%), asthma (17.8%), gastroesophageal reflux (16.4%) and hypertension (15.1%).

MEASURES

The research was conducted using the diagnostic survey method, i.e. a survey technique that uses four questionnaires:

A questionnaire prepared by the author containing questions about weight, physical activity, and health condition, i.e. the presence of civilizational diseases.

Adverse Childhood Experiences. A questionnaire prepared by the author concerning the experiences from the first 18 years of life, created based on the Adverse Childhood Experiences method. It contained 17 questions about addictions, mental disorders in the family, experienced poverty, a family member in custody, parental divorce, death of a parent, experience of violence or exposure to violence in the family and school environment. Three areas were covered by this part: the first contained questions about the parental and caring sphere. Respondents could mark "yes" or "no" or refuse to answer. The second group of questions covered experiences of violence or witnessing it in a family environment. The participants were asked to specify the frequency of such events ("many times", "several times", "once", "never", "I don't remember"). The last group of questions concerned various types of peer violence that the respondents could potentially experience. The authors

calculated the number of reported negative experiences for each of the respondents.

Experiences in Close Relationships. Polish adaptation of the Experiences in Close Relationships questionnaire was used to retrospectively assess mother and father attachment styles in childhood. It contains four scales measuring two attachment styles: anxious-ambivalent, assessed separately on the basis of the relationship with both parents, and avoidant, assessed separately on the basis of the relationship with both parents. The construction of the questionnaire was based on the attachment model, which was defined by two underlying dimensions: the other people model (avoiding intimacy and showing affection) and the self model (fear of abandonment). The participants were asked to answer the statements on a 7-point scale. The scores were calculated by summing up the scores for all items on the scale. The higher the score was, the higher was the intensity of a given attachment style. The reliability of the scales was also calculated using Cronbach's α . It was .89 for the scale measuring the avoidant style of attachment to the mother and .68 for the scale measuring the anxious-ambivalent style of attachment to the mother, and respectively .92 and .82 for the scales measuring the avoidant and anxious-ambivalent styles of attachment to the father (Marchwicki, 2004).

Interpersonal Emotion Regulation Questionnaire. Polish adaptation of the Interpersonal Emotion Regulation Questionnaire (IERQ), i.e. the Interpersonal Emotion Regulation Questionnaire (KIRE), which measures the regulation of emotions through contact or relationships with other people. The questionnaire consists of 20 questions and contains 4 subscales: Enhancing positive affect, Changing perspective, Soothing and Social modelling. The reliability analysis of the tool was demonstrated by the Cronbach's α method and was .86 for the tool. For the subscales, the results showed the following values: $\alpha = .75$ (Enhancing positive affect), $\alpha = .73$ (Changing perspective), $\alpha = .90$ (Soothing) and $\alpha = .81$ (Social modelling). The respondents determined to what extent the given sentence applies to them. A 5-point Likert scale was used, ranging from 1 (*definitely untrue*) to 5 (*definitely true*) (Grzywna et al., 2020).

PROCEDURE

The survey was conducted online via Google Forms; the respondents were invited to participate through social media (Facebook, Instagram). First, the respondents were asked to express their consent to participate in the study and to complete a survey containing basic demographic data. The further part of the survey was completed on the scales assigned to the given questionnaire.

The protocol of the study was approved by the Independent Bioethics Committee for Scientific Research at Medical University of Gdansk (protocol code NKBBN/324/2021).

RESULTS

In order to assess the correlations between adverse experiences and diagnosed diseases, cross-tables and χ^2 tests were conducted. A correlation was found between the overall index of childhood experiences and the diagnosed civilizational diseases ($\chi^2 = 112.60$, $p = .010$). However, there was no correlation between the characteristics of the family and household environment and the diagnosis of civilizational diseases in adulthood.

Pearson correlation coefficients were calculated to determine the degree of correlation between childhood experiences and the occurrence of diseases in adult life. Statistically significant positive correlations were found between the experience of emotional abuse in form of the caregiver's threats to abandon the child ($r = .21$, $p = .015$) and being bullied by other children and the number of diagnosed diseases ($r = .21$, $p = .012$). A result close to statistical significance was noted for the correlation between exposure to violence at home and the occurrence of diseases ($r = .16$, $p = .057$). The detailed results are presented in Table 1.

In order to calculate the correlation between the attachment style and the diagnosed diseases, the Pearson χ^2 test was used. The test revealed a statistically significant correlation between the fearful-ambivalent style developed in the relationship with the father and the diagnosed civilizational diseases in adulthood ($\chi^2 = 284.97$, $p = .004$).

The linear regression analysis was used to analyse the correlations between the attachment style and regulating emotions using interpersonal relations. The results of multiple linear regression analysis demonstrated that the assumed model of attachment styles was statistically significant and that it explains 12.0% of the variance of social modelling. The fearful-ambivalent style of attachment in the relationship with the mother is an important predictor of emotion regulation using social modelling ($p < .01$). A higher intensity of this style is linked to regulating negative emotions based on the reflections of other people or their observations while experiencing similar situations and facing similar difficulties (see Table 2).

Table 3 presents the results obtained using linear regression analysis. The model of attachment styles was statistically significant and explains 8.0% of the variance. A correlation was found between the fearful-ambivalent style in the relationship with the father and emotion regulation by seeking comfort and sympathy in other people ($p < .05$). There was also a no-

ticeable negative correlation at the verge of statistical significance between the avoidant style of attachment in the relationship with mother and soothing, which means that persons with higher intensity of this style seek emotional support in others less frequently.

The correlation between the style of attachment and enhancing positive affect as one of the aspects of emotion regulation was analysed using linear regression analysis (see Table 4). The model of attachment styles was statistically significant and explained 10.0% of the variance of enhancing positive affect. The fearful-ambivalent style in the relationship with the father was linked to a higher intensity

of seeking other people when positive emotions are experienced. The aim is to enhance the experienced positive emotions and to share the joy or happiness with others. There is also a visible negative correlation, at the verge of statistical significance, between the avoidant style in the relationship with the father, which means that persons with this style of attachment may seek others less frequently when they experience positive emotions.

No correlation was found between the attachment style developed in childhood and perspective taking, i.e. the tendency to use other people as a reminder that others are in a worse situation.

ACE, civilization diseases and emotion regulation

Table 1

Adverse childhood experiences and the diagnosis of civilizational diseases

	Pearson <i>r</i>	<i>p</i>
Did your parent, caregiver or another household member yell at you, offend or humiliate you?	.13	.135
Did your parent, caregiver or another household member threaten that they would abandon you or throw you out of the house?	.21	.015
Did your parent, caregiver or another household member kick you or beat you?	.14	.106
Did anyone touch you in a sexual way when you did not want to?	.13	.123
Did anyone force you to touch their body in a sexual way when you did not want to?	.07	.384
Did anyone have sexual intercourse with you although you did not want it?	.09	.270
Did you see or hear a parent or family member being insulted or humiliated at home?	.02	.798
Did you see or hear a parent or family member being beaten or kicked at home?	.16	.057
Have you ever been humiliated or bullied by other children?	.21	.012

Table 2

Attachment style and regulating emotions through social modelling

	β	<i>t</i>	<i>p</i>	<i>R</i>	<i>R</i> ²	adjusted <i>R</i> ²	<i>df</i>	<i>f</i>
Avoidant style with mother	-.16	-1.85	.067	.34	.12	-.09	4	4.55
Fearful-ambivalent style with mother	.29	2.93	.004					
Avoidant style with father	-.08	-0.77	.442					
Fearful-ambivalent style with father	.11	1.00	.321					

Table 3

Attachment style and emotion regulation by soothing

	β	<i>t</i>	<i>p</i>	<i>R</i>	<i>R</i> ²	adjusted <i>R</i> ²	<i>df</i>	<i>f</i>
Avoidant style with mother	-.18	-1.97	.051	.29	.08	.06	4	3.13
Fearful-ambivalent style with mother	.08	0.79	.433					
Avoidant style with father	-.12	-1.14	.225					
Fearful-ambivalent style with father	.24	2.02	.045					

Table 4*Attachment style and emotion regulation by enhancing positive affect*

	β	t	p	R	R^2	adjusted R^2	df	f
Avoidant style with mother	-.14	-1.52	.130	.32	.10	.07	4	3.74
Fearful-ambivalent style with mother	.14	1.38	.170					
Avoidant style with father	-.21	-1.96	.052					
Fearful-ambivalent style with father	.23	2.02	.045					

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Table 5*Adverse childhood experiences and emotion regulation*

	β	t	p	R	R^2	adjusted R^2	df	f
Adverse experiences								
Enhancing positive affect	.16	1.92	.057	.16	.03	.02	1	3.69
Taking perspective	.17	2.07	.041	.17	.03	.02	1	4.27
Soothing	.03	0.33	.742	.03	.00	-.01	1	0.11
Social modelling	.04	0.43	.667	.37	.00	-.01	1	0.19

Linear regression analysis was conducted to calculate the correlation between adverse childhood experiences and emotion regulation by contacting other people. The data analysis revealed a positive correlation between adverse childhood experiences and regulating emotions by taking perspective (see Table 5). This means that the higher the number of adverse events in childhood, the more the respondents tended to use other people to remind themselves that others are in a worse situation ($p < .05$).

DISCUSSION

The results of the present study point to significant links between adverse childhood experiences and the diagnosis of civilizational diseases in adulthood. Previous research on traumatic childhood experiences and their role in the emergence of diseases at further stages of life revealed a similar connection (e.g. Felitti et al., 1998; Rehkopf et al., 2016). In the first years of life, children and teenagers are particularly exposed to the harmful effects of dangerous environmental factors. Stress, especially long-term stress caused by violence and neglect, may have a negative influence on the structure of the developing brain, and increase the risk of stress-related illnesses, which often include civilizational diseases (American Academy of Pediatrics, 2014). Adverse experiences in the first years of life contribute to the occurrence of chronic diseases in two ways. One of them is the disruption of the mechanisms of reacting to stress, which might potentially lead to a chronic inflammatory process. The second one is related to the factors that medi-

ate the occurrence of diseases, i.e. impulsive, risky behaviour and undeveloped social support network, which are caused by the structural and neurodevelopmental changes in the brain (Sonu et al., 2019). After distinguishing the questions concerning specific factors of an adverse nature, correlations were found between three types of negative experiences and the civilizational diseases diagnosed in the respondents (although the result of being exposed to violence at home was on the border of statistical significance). One of the predictors of diagnosed civilizational diseases in adulthood was the experience of being bullied by peers in childhood. In the available subject literature, studies on the correlations between ACE and diseases focus mainly on the family environment (Brown et al., 2010; Dong et al., 2003; Kopec & Sayre, 2004; Monnat & Chandler, 2015). The obtained results emphasise the importance of peer relationships for further functioning and point to the need to expand the perspective of research on factors that determine health disorders to cover the experiences in the peer environment. A positive correlation was also found between the threat of being abandoned by the caregiver and the occurrence of civilizational diseases. Threats of abandonment may affect the sense of safety and further interactions with the environment, which was discovered by Rohner et al. (2005). In their study, being rejected by parents was one of the key factors in the aetiology of emotional, social, and behavioural difficulties in the development process of children, teenagers, and adults (Rohner et al., 2005). These difficulties included, among others, externalizing disorders, using psychoactive substances, and engaging in criminal activity, which, as has already

been described, have an indirect influence on the occurrence of many physical diseases. Apart from direct violence, a correlation at the verge of statistical significance was noted for being exposed to physical violence. Persons who witnessed the abuse of one of their caregivers more often reported civilizational diseases. These results are compliant with the study by Shaw and Krause (2002), who found that exposure to violence in the family was linked to deterioration of physical and mental health. Moreover, the correlation between attachment styles and the presence of civilizational diseases was also analysed. The fearful-ambivalent style in the relationship with the father proved to be a predictor of reported civilizational diseases. Some of the studies on the fearful style of attachment in adults pointed to a positive correlation between the fearful-ambivalent attachment style and a poor physical and mental health condition. However, no such correlation was found for the anxious-avoidant style (Lewczuk et al., 2021; Rapoza et al., 2016). Unfortunately, there are few publications concerning the correlations between the childhood attachment style in the relationship with the parent and the health condition in adult life that might offer a broader explanation of the obtained results.

The study also focuses on the processes of regulating emotions through interpersonal contacts. Traumatic childhood experiences are risk factors for interpersonal difficulties (Poole et al., 2018) and regulating emotional states in adulthood (Bradley et al., 2011; Burns et al., 2010; Carvalho Fernando et al., 2014). A positive correlation was found between adverse childhood experiences and regulating emotions by taking perspective, which means that a higher number of such negative childhood experiences was linked to a stronger tendency to use other people as reminders that others are in a worse situation. An important predictor of regulating emotions by social modelling is the fearful-ambivalent style of attachment in the relationship with the mother. Persons with a higher intensity of this style more often regulate negative emotions based on the reflections of other people or their observations while experiencing similar situations and facing similar difficulties. A correlation was also found between the fearful-ambivalent style in the relationship with the father and emotion regulation by seeking comfort and sympathy in other people. The authors of one of the few recent publications on interpersonal emotion regulation and its potential determinants related to attachment styles detected a positive correlation between the fearful-ambivalent attachment style and the strategy of regulating affect through soothing (Gökdağ, 2021). Similar results were obtained by Mikulincer (1998; Mikulincer et al., 2003) in studies on the correlation between attachment styles in adults and the method of regulating negative affect. In adults, the fearful-ambivalent style was associated with seeking sympathy and comfort

in others (Mikulincer, 1998). There was also a noticeable negative correlation at the verge of statistical significance between the avoidant style of attachment in the relationship with the mother and soothing, which means that persons with higher intensity of this style seek emotional support in others less frequently. The presented tendency confirms the research results that point to the suppression of negative emotions by people with an avoidant attachment style (Mikulincer et al., 2003; Wei et al., 2005). The fearful-ambivalent style in the relationship with the father was linked to a higher intensity of seeking other people when positive emotions are experienced, with the aim of enhancing the experienced affect and sharing the emotions with other people. A visible negative correlation, at the verge of statistical significance, was also found between the avoidant style in the relationship with the father, which means that persons with this style of attachment may seek others less frequently when they experience positive emotions. Goodall (2015) reported that persons with an avoidant style of attachment tend to suppress the experienced positive affect and do not regulate these emotional states by interpersonal contacts. Most of the academic publications on the potential factors that determine emotion regulation and social functioning focus on attachment in adults. The results cited above show a potential pattern of social behaviour that is used to regulate emotions in persons with specific attachment styles developed in their relationships with their parents.

LIMITATIONS

The results should be analysed considering several limitations. The relatively small sample and high disproportion between the gender of the respondents made it difficult to conduct an in-depth analysis of the experiential and emotional factors that determine specific civilizational diseases. Moreover, the data on adverse childhood experiences were assessed in retrospective. As a result, the respondents may have found it difficult to remember certain events and to define the frequency of their occurrence. Apart from that, the correlation between childhood experiences and diseases and ways to regulate emotions may have been influenced by a large number of different factors. The tool used to measure attachment styles did not allow us to examine the style of disorganized attachment, which is another limitation of our study. According to the literature, traumatic childhood experiences are closely related to this attachment style (Sroufe, 2005). In addition, a disorganized bond is a predictor of psychopathological symptoms, externalizing disorders (Van Ijzendoorn et al., 1999), HPA axis dysregulation (Pietromonaco & Powers, 2015) and increased inflammation (Bernard et al., 2019). A longitudinal study may provide more reliable and

precise results and an in-depth assessment of the correlations and potential confounding factors.

CONCLUSIONS

The study demonstrated that persons who experienced traumatic events in their families or in the peer environment in the first 18 years of their lives reported the presence of civilizational diseases. A correlation was found between peer violence, the threat of being abandoned by a caregiver, and the diagnosed civilizational diseases in respondents. A correlation at the verge of statistical significance was also found between being exposed to physical violence and the diagnosis of civilizational diseases.

The fearful-ambivalent style in the relationship with the father proved to be a predictor of the reported civilizational diseases.

Adverse childhood experiences are linked to regulating emotions by taking perspective.

The attachment style developed in the relationship with parents determined the ways of regulating negative and positive emotions in contact with other people. The fearful-ambivalent style in the relationship with the mother was correlated with regulating emotions through social modelling. The same style in the relationship with the father proved to be a predictor of regulating negative affect by soothing and of positive affect by social enhancements. Persons who developed an avoidant attachment style in the relationships with the mother or the father less frequently seek social support when they experience negative emotions (the result was at the verge of statistical significance).

DISCLOSURE

The authors declare no conflict of interest.

REFERENCES

American Academy of Pediatrics (2014). *Adverse childhood experiences and the lifelong consequences of trauma*. AAP.

Appleton, A. A., Buka, S. L., Loucks, E. B., Gilman, E., & Kubzansky, L. D. (2013). Divergent associations of adaptive and maladaptive emotion regulation strategies with inflammation. *Health Psychology, 32*, 748–756. <https://doi.org/10.1037/a0030068>

Archana, B., Katie, A. M., Supriya, M., & Karestan, C. K. (2017). Childhood maltreatment and health impact: The examples of cardiovascular disease and type 2 diabetes mellitus in adults. *Physiology & Behavior, 24*, 125–139. <https://doi.org/10.1111/cpsp.12191>

Bernard, K., Hostinar, C. E., & Dozier, M. (2019). Longitudinal associations between attachment quality in infancy, C-reactive protein in early childhood, and BMI in middle childhood: Preliminary evidence from a CPS-referred sample. *Attachment & Human Development, 21*, 5–22. <https://doi.org/10.1080/14616734.2018.1541513>

Bradley, B., DeFife, J. A., Guarnaccia, C., Phifer, J., Fani, N., Ressler, K. J., & Westen, D. (2011). Emotion dysregulation and negative affect: Association with psychiatric symptoms. *The Journal of Clinical Psychiatry, 72*, 685–691. <https://doi.org/10.4088/JCP.10m06409blu>

Brown, D. W., Anda, R. F., Felitti, V. J., Edwards, V. J., Malarcher, A. M., Croft, J. B., & Giles, W. H. (2010). Adverse childhood experiences are associated with the risk of lung cancer: a prospective cohort study. *BMC Public Health, 10*, 1–12. <https://doi.org/10.1186/1471-2458-10-311>

Burns, E. E., Jackson, J. L., & Harding, H. G. (2010). Child maltreatment, emotion regulation, and posttraumatic stress: The impact of emotional abuse. *Journal of Aggression, Maltreatment & Trauma, 19*, 801–819. <https://doi.org/10.1080/10926771.2010.522947>

Carvalho Fernando, S., Beblo, T., Schlosser, N., Terfehr, K., Otte, C., Löwe, B., Wolf, O. T., Spitzer, C., Driessen, M., & Wingenfeld, K. (2014). The impact of self-reported childhood trauma on emotion regulation in borderline personality disorder and major depression. *Journal of Trauma and Dissociation, 15*, 384–401. <https://doi.org/10.1080/15299732.2013.863262>

Central Statistical Office (2020). *Trwanie życia w 2019 r.* [Life expectancy in 2019]. Główny Urząd Statystyczny.

Coker, A. L., Hopenhayn, C., DeSimone, C. P., Bush, H. M., & Crofford, L. (2009). Violence against women raises risk of cervical cancer. *Journal of Women's Health, 18*, 1179–1185. <https://doi.org/10.1089/jwh.2008.1048>

Danaei, G., Ding, E. L., Mozaffarian, D., Taylor, B., Rehman, J., Murray, C. J. L., & Ezzati, M. (2009). The preventable causes of death in the United States: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors. *PLoS Medicine, 6*, e1000058. <https://doi.org/10.1371/journal.pmed.1000058>

Dong, M., Dube, S. R., Felitti, V. J., Giles, W. H., & Anda, R. F. (2003). Adverse childhood experiences and self-reported liver disease. *Archives of Internal Medicine, 163*, 1949. <https://doi.org/10.1001/archinte.163.16.1949>

Ehrlich, B. K., & Cassidy, J. (2019). Attachment and physical health: Introduction to the special issue. *Attachment and Human Development, 21*, 1–4. <https://doi.org/10.1080/14616734.2018.1541512>

Farrell, A. K., Waters, T. E. A., Young, E. S., Englund, M. M., Carlson, E. E., Roisman, G. I., & Simpson, J. A. (2019). Early maternal sensitivity, attachment secu-

- rity in young adulthood, and cardiometabolic risk at midlife. *Attachment and Human Development*, 21, 70–86. <https://doi.org/10.1080/14616734.2018.1541517>
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14, 245–258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8)
- Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of adverse childhood experiences. *Child Abuse and Neglect*, 48, 13–21. <https://doi.org/10.1016/j.chiabu.2015.07.011>
- Gökdağ, C. (2021). How does interpersonal emotion regulation explain psychological distress? The roles of attachment style and social support. *Personality and Individual Differences*, 176, 110763. <https://doi.org/10.1016/j.paid.2021.110763>
- Goodall, K. (2015). Individual differences in the regulation of positive emotion: The role of attachment and self esteem. *Personality and Individual Differences*, 74, 208–213. <https://doi.org/10.1016/j.paid.2014.10.033>
- Grzywna, N., Filipiak, K., Nowak, K., Buczel, M., & Szpitalak, M. (2020). Kwestionariusz Interpersonalnej Regulacji Emocji (KIRE). Adaptacja do warunków polskich, struktura czynnikowa i wartości psychometryczne kwestionariusza Interpersonal Emotion Regulation Questionnaire (IERQ) [Interpersonal Emotion Regulation Questionnaire (IERQ) in Polish speaking population: Adaption, factor structure and psychometric properties]. In A. Surma & M. Śliwa (Eds.), *Spółczesność i media – analiza wybranych zagadnień* [Society and media – analysis of selected issues] (pp. 269–286). Wydawnictwo Naukowe Tygiel.
- Kopec, J. A., & Sayre, E. C. (2004). Traumatic experiences in childhood and the risk of arthritis. *Canadian Journal of Public Health*, 95, 361–365. <https://doi.org/10.1007/bf03405147>
- Kopp, M. S., & Réthelyi, J. (2004). Where psychology meets physiology: Chronic stress and premature mortality – the Central-Eastern European health paradox. *Brain Research Bulletin*, 62, 351–367. <https://doi.org/10.1016/j.brainresbull.2003.12.001>
- Lewczuk, K., Kobylińska, D., Marchlewska, M., Krysztofiak, M., Glica, A., & Moiseeva, V. (2021). Adult attachment and health symptoms: The mediating role of emotion regulation difficulties. *Current Psychology*, 40, 1720–1733. <https://doi.org/10.1007/s12144-018-0097-z>
- Marchwicki, P. (2004). Style przywiązania a postawy rodzicielskie [Attachment styles and parental attitudes]. *Roczniki Psychologiczne*, 7, 81–103.
- Mikulincer, M. (1998). Adult attachment style and affect regulation: Strategic variations in self-appraisals. *Journal of Personality and Social Psychology*, 75, 420–435. <https://doi.org/10.1037/0022-3514.75.2.420>
- Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment theory and affect regulation: The dynamics, development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion*, 27, 77–102. <https://doi.org/10.1023/A:1024515519160>
- Miranda, J. J., Kinra, S., Casas, J. P., Smith, G. D., & Ebrahim, S. (2008). Non-communicable diseases in low- and middle-income countries: Context, determinants and health policy. *Tropical Medicine & International Health*, 13, 1225–1234. <https://doi.org/10.1111/j.1365-3156.2008.02116.x>
- Monnat, S. M., & Chandler, R. F. (2015). Long term physical health consequences of adverse childhood experiences. *The Sociological Quarterly*, 56, 723–752. <https://doi.org/10.1111/tsq.12107>
- Petruccielli, K., Davis, J., & Berman, T. (2019). Adverse childhood experiences and associated health outcomes: a systematic review and meta-analysis. *Child Abuse & Neglect*, 97, 104127. <https://doi.org/10.1016/j.chiabu.2019.104127>
- Pietromonaco, P. R., & Powers, S. I. (2015). Attachment and health-related physiological stress processes. *Current Opinion in Psychology*, 1, 34–39. <https://doi.org/10.1016/j.copsyc.2014.12.001>
- Poole, J. C., Dobson, K. S., & Pusch, D. (2018). Do adverse childhood experiences predict adult interpersonal difficulties? The role of emotion dysregulation. *Child Abuse & Neglect*, 80, 123–133. <https://doi.org/10.1016/j.chiabu.2018.03.006>
- Prüss-Ustün, A., van Deventer, E., Mudu, P., Campbell-Lendrum, D., Vickers, C., Ivanov, I., Forastiere, F., Gumy, S., Dora, C., Adair-Rohani, H., & Neira, M. (2019). Environmental risks and non-communicable diseases. *BMJ*, 364, l265. <https://doi.org/10.1136/bmj.l265>
- Puig, J., Englund, M. M., Simpson, J. A., & Collins, A. W. (2013). Predicting adult physical illness from infant attachment: a prospective longitudinal study. *Health Psychology*, 32, 409–417. <https://doi.org/10.1037/a0028889>
- Puzserova, A., & Bernatova, I. (2016). Blood pressure regulation in stress: Focus on nitric oxide-dependent mechanisms. *Physiological Research*, 65, S309–S342. <https://doi.org/10.33549/physiolres.933442>
- Rapoza, K. A., Vassell, K., Wilson, D. T., Robertson, T. W., Manzella, D. J., Ortiz-Garcia, A. L., & Jimenez-Lazar, L. A. (2016). Attachment as a moderating factor between social support, physical health, and psychological symptoms. *SAGE Open*, 6. <https://doi.org/10.1177/2158244016682818>
- Rehkopf, D. H., Headen, I., Hubbard, A., Deardorff, J., Kesavan, Y., Cohen, A. K., Patil, D., Ritchie, L. D., & Abrams, B. (2016). Adverse childhood experiences and later life adult obesity and smoking in the

ACE, civilization diseases and emotion regulation

- United States. *Annals of Epidemiology*, 26, 488–492. <https://doi.org/10.1016/j.annepidem.2016.06.003>
- Rohner, R. P., Khaleque, A., & Cournoyer, D. E. (2005). Parental acceptance-rejection: Theory, methods, cross-cultural evidence, and implications. *Ethos*, 33, 299–334. <https://doi.org/10.1525/eth.2005.33.3.299>
- Roy, B., Riley, C., & Sinha, R. (2018). Emotion regulation moderates the association between chronic stress and cardiovascular disease risk in humans: a cross-sectional study. *Stress*, 21, 548–555. <https://doi.org/10.1080/10253890.2018.1490724>
- Schierholz, A., Krüger, A., Barenbrügge, J., & Ehring, T. (2016). What mediates the link between childhood maltreatment and depression? The role of emotion dysregulation, attachment, and attributional style. *European Journal of Psychotraumatology*, 7, 32652. <https://doi.org/10.3402/ejpt.v7.32652>
- Sharma, M., & Majumdar, P. K. (2009). Occupational lifestyle diseases: an emerging issue. *Indian Journal of Occupational and Environmental Medicine*, 13, 109–112. <https://doi.org/10.4103/0019-5278.58912>
- Shaw, B. A., & Krause, N. (2002). Exposure to physical violence during childhood, aging, and health. *Journal of Aging and Health*, 14, 467–494. <https://doi.org/10.1177/089826402237179>
- Sly, P. D., Carpenter, D. O., Van den Berg, M., Stein, R. T., Landrigan, P. J., Brune-Drise, M. N., & Suk, W. (2016). Health consequences of environmental exposures: Causal thinking in global environmental epidemiology. *Annals of Global Health*, 82, 3–9. <https://doi.org/10.1016/j.aogh.2016.01.004>
- Sonu, S., Post, S., & Feinglass, J. (2019). Adverse childhood experiences and the onset of chronic disease in young adulthood. *Preventive Medicine*, 123, 163–170. <https://doi.org/10.1016/j.ypmed.2019.03.032>
- Sroufe, L. A. (2005). Attachment and development: a prospective, longitudinal study from birth to adulthood. *Attachment and Human Development*, 7, 349–367. <https://doi.org/10.1080/14616730500365928>
- Van Ijzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11, 225–250. <https://doi.org/10.1017/S0954579499002035>
- Wei, M., Vogel, D. L., Ku, T. Y., & Zakalik, R. A. (2005). Adult attachment, affect regulation, negative mood, and interpersonal problems: The mediating roles of emotional reactivity and emotional cutoff. *Journal of Counseling Psychology*, 52, 14–24. <https://doi.org/10.1037/0022-0167.52.1.14>
- Windle, M., Haardörfer, R., Getachew, B., Shah, J., Payne, J., Pillai, D., & Berg, C. J. (2018). A multivariate analysis of adverse childhood experiences and health behaviors and outcomes among college students. *Journal of American College Health*, 66, 246–251. <https://doi.org/10.1080/07448481.2018.1431892>
- World Health Organization (2017). *Preventing noncommunicable diseases (NCDs) by reducing environmental risk factors*. Retrieved from <https://www.who.int/publications/i/item/WHO-FWC-EPE-17.01>