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Exploring Childhood Trauma's Influence on Obesity: A Comprehensive Investigation

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Abstract

Objective: The study investigated the association between childhood trauma (CT), which is an environmental factor, and obesity.

Methods: The study was planned as a cross-sectional descriptive survey. Our study was conducted between 01.07.2022 and 01.08.2022. After obtaining informed consent from all participants over 18 years of age who presented to our outpatient clinic, they were examined using a face-to-face questionnaire. All subjects were interviewed using a 28-item CT scale form and a researcher-prepared questionnaire with 25 questions. The data obtained from the study were analyzed using the SPSS statistics 21 program and $p<0.05$ was considered significant.

Results: In our study, 63.67% of the 256 participants were female and 36.33% were male. The mean age of the participants was 38.53±14.61 years, and the mean body mass index was 30.01±7.14 kg/m^2. No statistically significant association was found between the variables of current and childhood obesity status of the study participants and their CT questionnaire (CTQ) score ($p>0.05$). In the study, the mean CTQ total score was 36.92±11.88. There was no statistically significant association between children's overweight/obesity problem and their childhood CTQ subgroup scores compared with their childhood peers ($p<0.05$).

Conclusion: In our study, no association was found between adult obesity and CTQ score. However, a significant association was found between emotional abuse, physical abuse, physical neglect, and obesity in adults, which are CTQ subsets.

Keywords: Obesity, psychological trauma, childhood

INTRODUCTION

It is widely recognized that obesity is a significant global public health issue that is steadily increasing in both developed and developing countries. According to the Turkish Epidemiology Survey of Diabetes, Hypertension, Obesity and Endocrine Disease study, 34.6% of individuals aged 19 years and above in Turkey are overweight, with 30.3% classified as obese. Health-related expenses associated with obesity, a worldwide chronic disease, account for 2-7% of the average healthcare spending (1). Previous research has established a link between adult obesity and traumatic childhood experiences. The World Health Organization defines obesity as "excessive fat accumulation that may harm health". Recent statistics reveal that the global prevalence of obesity has reached 47.1% in children and 27.5% in adults (2). The development of adult obesity is influenced not only by diet, genetic factors, and lifestyle but also by the social and environmental characteristics of communities and families. Key factors associated with the development of adult obesity related to family dynamics include anxiety, depression, anger, sexual abuse (SA), and childhood traumas (CTs) (2). When discussing the psychological factors contributing to the development of obesity, it is essential to highlight CTs. CTs encompass experiences such as sexual, physical, and emotional abuse (EA) and neglect endured by individuals before the age of 18 years. These traumas also

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include parental loss, divorce, migration, accidents, separation from parents, witnessing violence, and natural disasters (3). Numerous studies have consistently shown a significant relationship between adult obesity and exposure to CT (4,5). Despite this body of research, the precise mechanisms underlying the increased risk of obesity following CT remain incompletely understood (6). It has been demonstrated that disrupted eating behavior, often accompanied by psychological dysfunction, may explain the heightened risk of adult obesity (7). In line with findings that emphasize nutritional conditions and physiological factors during childhood, numerous studies indicate that emotionally distressing experiences during childhood may contribute significantly to the development of adult obesity (2,8). The primary objective of this study was to evaluate the prevalence of traumatic experiences during childhood among both obese and non-obese individuals and to determine the relationship between childhood traumatic experiences and adult obesity.

METHODS

Our study is a descriptive cross-sectional research carried out during the period from July 1, 2022, to August 1, 2022. We determined the sample size for our study by considering group means and standard deviations to estimate the effect size using G*Power 3.1.9.7 software. The α error probability was set at 0.05, and the study power (1-α error probability) was set at 0.95. With these parameters, we calculated the study's actual power to be 96%, thereby necessitating a total sample size of 246. Using a simplified sampling method, between the specified dates, we conducted face-to-face interviews with individuals aged 18 years and above, both obese and non-obese, who visited the Family Medicine Clinic at Prof. Dr. Cemil Taşcıoğlu City Hospital and willingly consented to participate in the study. In our research, all participants received a 28-item CT questionnaire (CTQ) developed by Bernstein et al. (9) and adapted and validated in Turkish (10).

The primary purpose of the CTQ is to retrospectively evaluate CTs. The CTQ consists of 28 items, 25 of which measure childhood maltreatment (total) and includes five subscales of five items each: EA, physical abuse (PA), SA, emotional neglect (EN), and physical neglect (PN). Three items were designed to measure minimization/denial. All five abuse and neglect subscales are the sum of ratings from "never true" (score 1) to "very often true" (score 5), and all subscales can therefore range from 5 to 25 after reversing seven items. When determining the minimization score, only the highest 5 (maximum) scores for each of these items are considered, each contributing 1 point. Separate calculation of scores for the traumatic experience subscales and the total score is possible. Each subscale ranges from 5 to 25 points. The total score from the scale ranges from 25 to 125. In addition, participants completed a 25-question survey created by our research team to gather information on their height, weight, sociodemographic details, chronic ailments, and distinctive attributes.

This study was approved by İstanbul Prof. Dr. Cemil Taşcıoğlu City Hospital Clinical Research Ethics Committee (approval number: E-48670771-514.99, date: 25.05.2022).

Statistical Analysis

To analyze our research outcomes, we used SPSS 21 (Statistical Package for the Social Sciences, version 21) statistical software. Normal distribution was assessed using the Kolmogorov-Smirnov test. Descriptive statistics were provided for numerical variables, including minimum, maximum, median, mean, and standard deviation, whereas categorical variables were presented in terms of frequency and percentage. For comparing means, the Mann-Whitney U test and Kruskal-Wallis test were utilized, and for comparing qualitative data, Pearson's chi-square test and Fischer exact test were applied. The impact of certain variables on CTQ scores was examined using multivariate linear regression analysis (method: enter). We considered a p-value less than 0.05 to be statistically significant when interpreting our results.

RESULTS

Among the 256 participants, 63.67% were female and 60.94% were married. Over half of the participants were university graduates. Of the participants, 52.34% were employed, and 71.48% had three or more siblings. 93.36% had lived with their biological parents during childhood (Table 1). The prevalence of obesity was found to be statistically significantly higher among those who experienced other traumas (like divorce traumas, natural disaster traumas etc.) during childhood ($p<0.01$) (Table 2).

In the study, the total score average CTQ was determined as 36.92±11.88. Among the subgroups, EA was found to be 7.05±3.07, PA 6.21±2.95, PN 7.45±3.10, EN 10.58±5.14, SA 5.64±1.98, and minimization 0.91±1.07. Table 3 presents the average scores of CTQ scale subgroups according to gender.

The results of the linear regression analysis predicting the CTQ scores for various variables are presented in Table 4. When examining the model outcomes, it was observed that the variable of living with a stepmother/stepfather during childhood ($p=0.044$), the variable of obesity within relatives (present) ($p=0.033$), and the variable of diagnosed psychiatric illness

(present) (p<0.001) significantly predicted CTQ scores. Living with a stepmother/stepfather during childhood increases CTQ scores by 11.137 points, the presence of obesity in relatives increases scores by 3.060 points, and having a diagnosed psychiatric illness increases scores by 7.806 points. These variables collectively account for 18.3% of the total variance in CTQ scores.

DISCUSSION

In our study, no relationship was found between adult obesity and CTQ scores. However, significant associations were observed between adult obesity and specific CTQ subscales, namely PA, EA, and PN. Observational studies on CT conducted in the literature show a positive relationship with adult obesity, with a positive association of 1.46 between CT and adult obesity in a meta-analysis of multiple studies, indicating a 46% likelihood of adult obesity after exposure to multiple CTs during childhood (11). Similarly, Bentley and Widom (12) found a significant relationship between PA and obesity. Another study confirmed the link between all forms of abuse and adult obesity, highlighting the significant role of EA during childhood in the development of obesity (13). The significant increase in PN scores found in our study among obese individuals has been associated in previous research with dietary restriction in women. This study observed that women who experienced PN during childhood were more likely to engage in dietary restrictions in adulthood. The same study found that EA was significantly associated with higher levels of body dissatisfaction, increased depression, and lower

Table 1. Comparison of sociodemographic characteristics and CTQ scores

		Total CTQ score					
		Min	Max	Median	Mean	SD	p-value
Age group	<33	25	73	33	35.20	9.62	0.127
	≥33	25	83	34	38.63	13.59	
Gender	Female	25	83	33	37.30	12.88	0.797
	Male	25	73	34	36.25	9.91	
Relationship status	Married	25	83	34	37.95	12.99	0.533
	Single	25	71	33	34.96	8.93	
	Divorced/widow	25	70	33	36.70	12.62	
Education level	Primary school	25	83	36	40.39	14.83	0.144
	High school	25	53	33	34.91	7.81	
	University	25	73	34	35.52	9.48	
	Master/doctorate	25	61	32	33.19	8.46	
Employment status	Not working	25	83	35	38.78	14.17	0.296
	Working	25	73	33	35.22	9.04	
Income level	Low	25	83	34	38.34	10.27	0.013
	Medium	27	65	39	39.82	8.81	
	High	25	73	32	34.02	11.04	
Who did you live with during childhood?	Mother/father	25	83	33	36.08	11.04	0.001
	Stepmother/stepfather	32	79	48	53.36	15.47	
	Non-family members	25	70	36	40.00	16.64	
Number of siblings	<3	25	73	32	34.44	9.55	0.052
	≥3	25	83	34	37.91	12.57	

CTQ: Childhood trauma questionnaire, SD: Standard deviation, Min: Minimum, Max: Maximum

Table 2. Comparison of the obesity status of individuals with childhood traumas

		Obese		Non-obese		
		n	%	n	%	p-value
Experiencing other traumas during childhood	Yes	61	60.40	40	39.60	0.006*
	No	62	42.76	83	57.24	

Pearson chi square test *p<0.01

self-esteem in both men and women (14). In Bennet et al. (15), no relationship was found between PN and body mass index (BMI). High BMIs were only associated with lower obesity risk in neglected children aged 8 years. It is likely that children subjected to PN may experience nutritional deficiencies, resulting in lower BMIs. However, studies suggest that children tend to gain weight as they age. Considering that other types of trauma (EA, etc.) often coexist with cases of PN, it could indirectly influence obesity.

Wiederman et al. (16) investigated the connection between SA and obesity among women and found a statistically significant association. Furthermore, obese women with a history of SA displayed notably lower levels of body dissatisfaction than their non-abused obese counterparts. Obese women who have experienced SA display less weight fluctuation compared with their non-abused obese counterparts. Among participants enrolled in a hospital-based weight management program, individuals with a history of SA had a lower rate of success in weight loss compared with a control group matched with non-abused peers (17). In the Felitti (18) study, some women with a history of SA were found to be less willing to lose weight. A significant number of adult women with obesity reported that they became obese shortly after experiencing childhood SA. An alternative hypothesis suggests that some sexually abused obese women may exhibit a reduced willingness to shift from an obese to a non-obese state as a coping mechanism to avoid close physical relationships with men. As a result, these women might have felt greater psychological comfort at a higher weight but may not have fully understood the psychodynamic implications of their usual "barrier weight". In contrast to our study, a significant negative correlation was found between obesity and the CTQ subcategory of SA in obese individuals. Given this context, it is important to recognize that societal factors such as reticence, shyness, stigma, and traditional lifestyles may contribute to inaccurate responses to inquiries about SA.

No significant relationship was found between obesity and EN in our study ($p>0.05$). Pederson and Wilson (19), in a study of 207

Table 3. CTQ subgroup average scores according to gender

		n	Minimum	Maximum	Mean	SD
Physical abuse	Female	163	5	23	6.52	3.450
	Male	93	5	13	5.66	1.632
Emotional abuse	Female	163	5	21	7.34	3.350
	Male	93	5	16	6.54	2.434
Physical neglect	Female	163	5	21	7.39	3.343
	Male	93	5	16	7.56	2.639
Emotional neglect	Female	163	5	25	10.29	5.099
	Male	93	5	24	11.08	5.213
Sexual abuse	Female	163	5	19	5.76	2.211
	Male	93	5	15	5.42	1.477
Minimization	Female	163	0	3	0.91	1.070
	Male	93	0	3	0.91	1.080

CTQ: Childhood trauma questionnaire, SD: Standard deviation

Table 4. Linear regression analysis for the prediction of some variables on the CTQ score

	B	Std. Error	Beta	t	p-value	Lower	Upper
Income level (high)	-2.586	1.757	-0.105	-1.472	0.142	-6.047	0.874
Income level (medium)	1.124	2.273	0.030	0.495	0.621	-3.352	5.601
Who did you live with in childhood (mother/father)	-1.536	4.497	-0.032	-0.342	0.733	-10.393	7.320
Who do you live with during childhood (stepmother/ stepfather)	11.137	5.491	0.191	2.028	0.044	0.322	21.951
Obese	-1.893	1.717	-0.080	-1.103	0.271	-5.275	1.488
Diagnosed obesity in a first-degree relative	3.060	1.425	0.129	2.147	0.033	0.253	5.868
Diagnosed psychiatric illness	7.806	1.695	0.284	4.604	0.000	4.467	11.145
Diagnosed psychiatric illness in a first-degree relative	1.910	1.824	0.061	1.407	0.296	-1.682	5.502

CTQ: Childhood trauma questionnaire, Std.: Standard, B: Regression coefficient, t: t-statistic

women, found a relationship between obesity and EN but did not find a relationship between other subcategories of CTs and obesity.

Among those who lived with a stepmother/stepfather during childhood, a higher prevalence of adult obesity and a higher likelihood of experiencing CTs were found compared with those who lived with their biological parents. Our findings suggest that any trauma experienced during childhood may contribute to obesity in adults. Further comprehensive studies are required to illuminate the mechanisms of this relationship.

CONCLUSION

In our study, we did not discover a link between adult obesity and CTQ scores. Nevertheless, notable connections were identified between adult obesity and distinct CTQ subcategories, including PA, EA, and PN. Conversely, no correlation was established between EN, SA during childhood, and obesity in adults. Notably, a higher incidence of obesity was observed among individuals who experienced different CTs, such as family members departing, parental divorce, family member loss, significant illnesses, surgeries, or exposure to natural disasters.

Considering that family medicine practitioners have the opportunity to get to know both children and their families in the patient population they serve, it is crucial for them to always be vigilant regarding any suspicious situations that may suggest child abuse and neglect. By taking appropriate measures, the negative effects of CT and the impact on the development of obesity, a chronic disease, can be mitigated.

Ethics

Ethics Committee Approval: This study was approved by İstanbul Prof. Dr. Cemil Taşcıoğlu City Hospital Clinical Research Ethics Committee (approval number: E-48670771-514.99, date: 25.05.2022).

Informed Consent: Informed written consent was obtained from all participants.

Authorship Contributions

Surgical and Medical Practices: H.B., Concept: H.B., F.E., S.A., E.K., Design: H.B., E.K., Data Collection or Processing: H.B., F.E., H.H.M., E.K., Analysis or Interpretation: H.B., F.E., H.H.M., S.A., Literature Search: H.B., F.E., S.A., Writing: H.B., F.E., H.H.M.

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