Research Article

The Association between Obesity and Trait Emotional Intelligence in Children 8-12 Years Old

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Abstract

Background: Obesity in children is an increasing public health issue that has an impact on both mental and physical health. Given this, the current study sought to find out if childhood overweight/obesity was associated with emotional intelligence. **Method:** The study included 259 children aged 8 to 12. A body mass index above the age and gender 95th percentile was considered obese, whereas an index between the 85th and 95th percentile was considered overweight. A self-administered questionnaire aimed at measuring material household wealth as a gauge of the absolute degree of socio-economic status is one of the additional data sets. In order to evaluate emotional intelligence based on traits, we used Trait Emotional Intelligence Questionnaire-Child Form- Sort Form (TEIQue-CSF). **Results:** Mean EI score was 3.57 (SD=0.51) for all children. Boys (M=3.48; SD=0.47) had significantly lower EI score than girls (M=3.62; SD=0.53; p=0.038). Also, overweight/obese children (M=3.35; SD=0.50) had significantly lower EI score than the normal ones (M=3.68; SD=0.48; p<0.001). Children with high socio-economical level had significantly greater EI score as well as those whose mother participated in the study. It was showed that after adjusting for all participants' characteristics, BMI (β=-0.29; SE=0.07; p<0.001) and FAS (β=0.15; SE=0.06; p=0.017) were significantly associated with EI, in a similar to the univariate analysis way. Conclusion: Although the sample is small to generalize the results there is obviously a strongly correlation between lower EI and overweight/obesity. This association promotes the need for prevention program for childhood overweight and obesity.

Keywords: Body Mass Index (BMI); Obesity; Pediatrics; Socioeconomic Risk Factors; Child Care

Introduction

Both negative psychological and physical health impacts among them low self-esteem, depression, anxiety, and weight-related apprehension, heart disease, asthma, type 2 diabetes, are associated with childhood obesity [1]. The percentage of children and adolescents (6–19 years old) who are obese is approximately 18% for females and 19% for males [2]. One of the significant health issues of the twenty-first century is childhood overweight and obesity and the disordered eating attitudes and behaviors which go in tandem with it [3]. Research has repeatedly demonstrated that disordered eating behaviors and childhood obesity are linked with an array of physical health problems that follow people into adulthood, additional risk of acquiring eating disorders (EDs), including anorexia, bulimaxeria such as binge eating disorder, during adolescence [4]. It was established that the risk factors for these consequences are behavioral, psychological (ideal body weight perception, personality traits, and unique temperament) and interpersonal natures in children and adolescents [5].

Specifically given the crucial age-related period that adolescents are going through, a poor body image might be a key indicator of food intake and weight problems in adolescents [6]. Adolescent girls' emotional states and body pleasure have been proven to be related [7]. The current study outlines the association presently exist between BMI and emotional intelligence. Outcomes achieved the objectives set out, so the discussion afterwards compares the actual result with those from earlier studies [6,7].

Materials and Methods

Participants

The participants of the study were parents and their children. Following the submission of written informed consent by legal guardians. The study included 259 parents as well as children who were recruited from third to sixth grade elementary schools.

Study procedures

Between November 2021 and November 2022, participants in the cross-sectional study completed an anonymous, voluntary questionnaire. The research was approved by the Ethics Committee of the University of West Attica and the scientific councils of the Ministry of Education and Religious Affairs, Athens, Greece. Moreover, it was necessary the approval of the principal and the Board of Teachers. Because of global pandemic restrictions, an alternative method of distributing and gathering questionnaires was required, hence an electronic version of instrument was developed.

Tools

There were four sections to the research tool

1. Sociodemographic questionnaire: Made to get data on sex and age. This instrument was also used to collect information on the participants' marital and educational status, residence, occupational status such as eating habits and self-reported weight and height. These particular values for adults were cut-off points utilized in the current study: Underweight (scores below 18.5 kg/m2), normal weight (values between 24.99 kg/m2 and 18 kg/m2), overweight (scores between 25 kg/m2 and 29.99 kg/m2), and Obesity (scores above 30 kg/m2). The BMI for children was calculated using the Cole et al growth charts and each participant's self-reported weight measured in kilograms (kg) and height (measured in meters) (m) as kg/m2 [8]. The 15th to 85th centiles of body mass index for age and sex was recommended as normal weight. To distinguish between overweight and obesity, the 85th and 95th centiles of body mass index for both sex and age have been suggested as cutoff thresholds [8].

2. The Family Affluence Scale (FAS) was developed as a tool to gauge a family's absolute socioeconomic status by measuring their material affluence [9-11].

3. The following reports were included in the FAS scale: having a family car (0,1,2, or more), owing a bedroom (no=0, yes=1), having family vacation (0,1,2, or 3 or more) and having a family computer (0,1,2, or 3 or more). For the evaluation of trait based emotion intelligence, we used 4. Trait Emotional Intelligence Questionnaire-Child Form- Sort Form (TEIQue-CSF). The 36 items of the shortened type of "The Trait Emotional Intelligence Questionnaire" (TEIQue) which is designed for children 8 to 12 are answered on a five-point Likert scale (1 being strongly disagreed and 5 being entirely agreed) yield a global score [12].

Statistical analysis

While absolute and relative frequencies were used to convey qualitative factors, mean values (SD) were used to express quantitative variables. Student's t-tests and ANOVA were calculated to compare the mean values. To investigate the association between two continuous variables, Pearson correlations coefficients (r) were used. Utilizing multiple linear regression analysis, the EI score was the dependent variable. From the outcomes of the linear regression analysis, adjusted regression coefficients (β) with standard errors (SE) were calculated. Every p-value that is published has two tails. The analyses were carried out using SPSS statistical software (version 26.0), with a significance level of $p < 0.05$.

Results

Sample consisted by 259 participants and their children, whose characteristics are presented in (Table 1) Mean parents' age was

41.8 years (SD=5.7 years) and mean children's age was 9.9 years (SD=1.4 years). In relation to obesity, it was found 29,7% overweight and 5% obesity. The majority of the children were girls (62.2%) and had normal BMI (62.5%). High FAS level had 58.3% of the sample. In most cases (99.2%) the biological parent of the children participated in the study. Almost half parents (50.1%) had normal BMI and 90.7% were married.

		N (%)
Children's Age, mean (SD)		9.9 (1.4)
Children's Gender		
Females		161 (62.2)
	Males	98 (37.8)
Children's BMI		
	Underweight	7 (2.7)
	Normal	162 (62.5)
	Overweight	77 (29.7)
	Obese	13 (5)
FAS		
	Low	8 (3.1)
	Moderate	100 (38.6)
	High	151 (58.3)
Child's nationality		
	Greek	256 (98.8)
	Albanian	3 (1.2)
Relationship with child		
	Biological parent	257 (99.2)
	Foster parent	2 (0.8)
Parent's age, mean (SD)		41.8 (5.7)
Parents' gender		
	Women	210 (81.1)
	Men	49 (18.9)
Parents' BMI		
	Underweight	1 (0.4)
	Normal	130 (50.2)
	Overweight	101 (39)
	Obese	27 (10.4)
Maternal educational level		
	High school	98 (37.8)
	Technological university	70 (27)
	University	51 (19.7)
	MSc	34 (13.1)
	PhD	6 (2.3)
Paternal educational level		
	High school	119 (46.1)
	Technological university	60 (23.3)
	University	36 (14)
	MSc	33 (12.8)
	PhD	10 (3.9)
Married parents		235 (90.7)
Child living with both parents		238 (91.9)

Table 1: Samlpe characteristics.

Moreover, 91.9% of the children were living with both parents. Mean EI score was 3.57 (SD=0.51) for all children. Boys (M=3.48; SD=0.47) had significantly lower EI score than girls (M=3.62; SD=0.53; p=0.038), as shown in (Table 2) Also, overweight/obese children (M=3.35; SD=0.50) had significantly lower EI score than underweight/normal ones (M=3.68; SD=0.48; p<0.001), (Figure 2) Children with high socio-economical level had significantly greater EI score as well as those whose mother participated in the study. Multiple linear regression analysis showed that after adjusting for all participants' characteristics BMI (β=-0.29; SE=0.07; p<0.001) and FAS (β=0.15; SE=0.06; p=0.017) were significantly associated with EI, in a similar to the univariate analysis way (Table 3).

	Mean (SD)	P
Total sample	3.57 (0.51)	-
Children's Age, r[1]	-0.05	0.420
Children's gender		
Females	3.62 (0.53)	0.038+
Males	3.48 (0.47)	
Children's BMI		
Underweight/ Normal	3.68 (0.48)	<0.001+
FAS		
Low/ Moderate	3.44 (0.51)	0.001+
High	3.65 (0.50)	
Parent's age, r[1]	-0.09	0.157
Parents' gender		
Women	3.62 (0.50)	**0.001+**
Men	3.35 (0.51)	
Parents' BMI		
Underweight/ Normal	3.61 (0.53)	0.126+
Overweight/ Obese	3.52 (0.50)	
Maternal educational level		
High school	3.51 (0.53)	0.321++
Technological university/ University	3.59 (0.53)	
MSc/ PhD	3.64 (0.38)	
Paternal educational level		
High school	3.54 (0.53)	0.767++
Technological university/ University	3.58 (0.51)	
MSc/ PhD	3.60 (0.49)	
Married parents		
No	3.57 (0.57)	0.954+
Yes	3.57 (0.51)	
Child living with both parents		
No	3.57 (0.61)	0.950+
Yes	3.57 (0.51)	

Table 2 : TEI-Que in total sample and its association with participants' characteristics; +Student's t-test; ++ANOVA; 1Pearson's correlation coefficient.
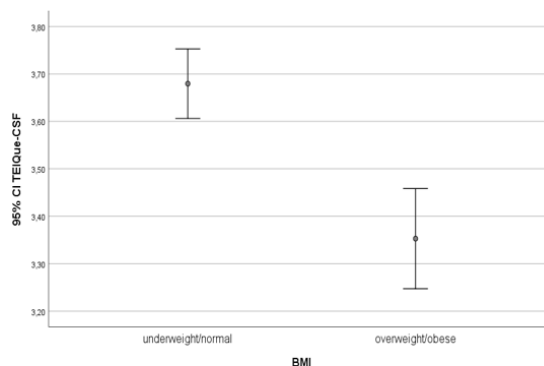

Figure 1: EI score by children's BMI.

	β+	SE++	P
Age	-0.03	0.02	0.260
Children's gender (males *vs* females)	-0.09	0.06	0.168
BMI (overweight/obese *vs* underweight/ normal)	-0.29	0.07	**0.000**
FAS (High *vs* Low/ Moderate	0.15	0.06	0.017
Parent's age	0.00	0.01	0.476
Parents' gender (Men *vs* Women)	-0.14	0.08	0.087
Parents' BMI (overweight/obese *vs* underweight/normal)	-0.04	0.06	0.531
Maternal educational level			
Technological university/ University *vs* High school	0.02	0.08	0.804
MSc/ PhD *vs* High school	0.05	0.11	0.633
Paternal educational level			
Technological university/ University *vs* High school	0.05	0.08	0.567
MSc/ PhD *vs* High school	0.05	0.11	0.627
Married parents (yes *vs* no)	0.08	0.29	0.772
Child living with both parents (yes *vs* no)	-0.20	0.31	0.522

Table 3: EI score as the dependent variable in the findings of multiple linear regression analysis; +regression coefficient; ++Standard Error.

Discussion

The main objective of this study was to examine the correlation between excess weight and trait-based emotional intelligence (EI) in primary school students. The research supports the findings of the WHO Regional Report on Obesity in Europe 2022, which shows a worrying trend: About one third of children in the European Region are overweight or obese [13]. Our findings confirm that increased levels of emotional intelligence (EI) have a negative correlation with Body Mass Index (BMI) in both male and female students. Additionally, a high EI score is often indicative of a higher socio-economic status.

Gender disparities in EI scores were also detected, with boys demonstrating significantly lower EI scores than girls. This aligns with existing literature suggesting that girls exhibit higher levels of trait EI than boys during their primary [12] and secondary education [14,15]. Inconsistencies in findings across studies can largely be attributed to gender-specific nuances at both the facet and factor levels of trait EI. However, as supported by Mavroveli and colleagues, these nuances seem to converge when trait EI is considered as a whole [16]. The findings have several implications, raising questions about socioeconomic influences on emotional maturation and emotional intelligence's potential impact on childhood obesity [17,18]. This investigation advances a more profound comprehension of these interrelations and emphasizes the requirement for focused interventions that account for emotional intelligence and socio-economic status while addressing childhood obesity.

In our study, we observed a significant relationship between maternal participation in our research and higher Emotional Intelligence (EI) scores among their children, particularly in comparison to children from low socioeconomic backgrounds. These findings substantiate prior research, such as Lager's work [19], which also established a positive association between emotional intelligence and socioeconomic status among school-aged boys. Moreover, our investigation unveiled a robust correlation between pupils' EI scores and their perceived levels of fulfillment in relation to their family's socioeconomic status [17].

The research outcomes presented in this study shed light on a significant relationship between maternal participation in our study and higher Emotional Intelligence (EI) scores in children, particularly when compared to children hailing from low socioeconomic backgrounds. These findings are consistent with prior research, such as Lager's work [19], which also established a positive association between emotional intelligence and socioeconomic status among school-aged boys. Additionally, our investigation uncovered a notable correlation between the emotional intelligence scores of pupils and their level of satisfaction in the context of their family's socioeconomic status [20].

The implications of these findings extend beyond the mere observation of correlations. They point to a complex interplay of factors that warrants further examination. Firstly, the influence of parents on the emotional intelligence development of children has been a recurring theme in the literature [21]. Secondly, the link between emotional intelligence and childhood obesity is well-documented [22].

In such situations, a nurturing parent-child relationship can act as a protective factor against stress and the importance of effective parenting becomes especially significant during the formative year [18,23]. These connections underscore the significance of parental behavior perceptions and psychosocial traits in the context of childhood obesity. Parents occupy a central role in shaping their children's attitudes, behaviors, and lifestyles. They establish norms and regulations within the household, especially concerning dietary choices and physical activity. Furthermore, parents serve as primary role models for their offspring [24].

Consequently, our study underscores the importance of comprehending parental behaviors, perceptions, and psychosocial attributes, as they are pivotal factors in addressing the multifaceted issue of childhood obesity. Further research in this area is warranted to investigate intricate mechanisms at play and to develop effective interventions for addressing this pressing public health concern.

Limitations

This study contains several limitations. First, the data were collected during the first year that schools operated after lockdown that had occurred in Greece and the school closure restricts so the participants might be influenced by this situation. Moreover, the study included 259 students in total, which is not a typical sample to extrapolate the finding from. Nevertheless, it is necessary to be done further research with a larger sample.

Conclusions

The poor Emotional Intelligence seems to be one of the negative consequence of overweighty/obesity in childhood. Moreover, the family socio-economic status seems to be associated, too. Our results are in line with the idea that the design of prevention program for childhood obesity should be based on children's need for emotional enhancement.

Authorship Contribution Statement

Eftychia Ferentinou : Methodology (equal), Investigation (equal), Data Curation (equal), Writing- Original Draft (equal).

Ioannis Koutelekos: Methodology (equal), Investigation (equal)

Evaggelos Dousis: Writing-Review & Editing (equal)

Eleni Evaggelou: Writing-Review & Editing (equal)

Despoina Pappa: Methodology (equal), Investigation (equal) Software, Data Curation (equal), Validation

Afroditi Zartaloudi: Formal Analysis

Maria Theodoratou: Writing-Review & Editing

Aggeliki Bilali: Investigation (equal)

Nikoleta Margari: Investigation (equal)

Alexandra Koreli: Investigation (equal)

Martha Kelesi: Project Administration

Chrysoula Dafogianni: Methodology, Investigation (equal), Supervision, Conceptualization (lead)

Conflict of Interest

The authors have declared no conflicts of interest.

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