

Weight excess among high-school students: Relation with mental health and socio-demographic factors

Surcharge pondérale chez les lycéens : Relation avec la santé mentale et les facteurs socio-démographiques

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ABSTRACT

Introduction: The escalating prevalence of adolescent obesity represents a complex public health challenge, influenced by interactions of environmental, socio-economic, and behavioral factors. Recent studies reveal a surge in addictive substance use among adolescents, with non-substance addictions. Overweight adolescents are particularly susceptible to risky behaviors. Tunisia is not exempt from this issue, facing a rapidly increasing prevalence.

Aim: Our work aimed to assess the prevalence of obesity among adolescents and to explore the connections between sociodemographic factors, mental health, and overweight in this demographic group.

Methods: A cross-sectional study was led among sample of Tunisian high school adolescents from Sousse. We enrolled study participants through proportional stratified sampling.

Results: Our study included 1399 students, predominantly female, with an average age of 17±1.5 years. The average BMI (Body Mass Index) was 22.7±4.1 kg/m². According to the International Obesity Task Force (IOTF), 20.4% were overweight, and 7% were obese, resulting in an overall weight excess prevalence of 27.4%. Girls exhibited a higher weight excess prevalence compared to boys. Multivariate analysis identified factors associated with overweight and obesity, including maternal self-employment (aOR=2.13, [1.35-3.35]; p<0.001), regular physical activity (aOR=0.61, [0.47-0.8]; p<0.001), internet usage ≥2 hours (aOR=0.70, [0.50-0.99]; p=0.045), daily fruit-vegetable consumption (aOR=1.51, [1.15-1.97]; p=0.003), possible alexithymia (aOR=1.55, [1.07-2.22]; p=0.018), probable anxiety (aOR=1.28, [0.87-1.89]; p=0.007), very probable anxiety (aOR=1.61, [1.14-2.2]; p=0.037), and problematic Facebook-use (aOR=0.67, [0.50-0.89]; p=0.006).

Conclusion: Understanding factors tied to excess weight in our social and cultural context is crucial in shaping effective public health strategies. Interventions should adopt a multisectoral approach specifically targeting working mothers within the adolescent's socio-familial environment. It is fundamental also to address mental health concerns, with a particular focus on alexithymia and anxiety.

Key words: obesity- overweight - mental health - addiction- adolescent

RÉSUMÉ

Introduction: La prévalence croissante de l'obésité chez les adolescents représente un défi complexe de santé publique. Des études récentes révèlent une augmentation de la consommation de substances addictives chez les adolescents, avec des addictions non liées aux substances. Les adolescents en surpoids sont particulièrement susceptibles à ces comportements à risque. La Tunisie, en transition démographique, n'est pas épargnée de ce phénomène, avec une prévalence en augmentation inquiétante.

Objectif: Notre travail visait à évaluer la prévalence de l'obésité chez les adolescents et à explorer les liens entre les facteurs sociodémographiques, la santé mentale et le surpoids. Méthodes : Une étude transversale a été menée auprès d'un échantillon d'adolescents tunisiens des lycées de Sousse. Les participants à l'étude ont été recrutés par un échantillonnage stratifié proportionnel.

Résultats: Notre étude comprenait 1399 étudiants, majoritairement féminins, avec un âge moyen de 17±1,5 ans. L'IMC (Indice de Masse Corporelle) moyen était de 22,7±4,1 kg/m². Selon les critères de l'International Obesity Task Force (IOTF), 20,4% étaient en surpoids et 7% étaient obèses, aboutissant à une prévalence globale de surcharge pondérale de 27,4%. Les filles présentaient une prévalence plus élevée de surcharge pondérale par rapport aux garçons. L'analyse multivariée a identifié des facteurs associés au surpoids et à l'obésité, notamment une profession libre de la mère (ORa=2,13, [1,5-3,35], p<0,001), une activité physique régulière (ORa=0,61, [0,47-0,80], p<0,001), une utilisation d'internet ≥2 heures (ORa=0,70, [0,5-0,9], p=0,045), une consommation quotidienne de fruits et légumes (ORa=1,51, [1,15-1,97], p=0,003), une alexithymie possible (ORa=1,55, [1,07-2,22], p=0,018), une anxiété probable (ORa=1,28, [0,87-1,89], p=0,007), une anxiété très probable (ORa=1,61, [1,14-2,2], p=0,037), et une utilisation problématique du Facebook (ORa=0,67, [0,5-0,8], p=0,006).

Conclusion: La compréhension des facteurs liés à la surcharge pondérale dans notre contexte social et culturel est cruciale pour développer des stratégies efficaces. Accorder une attention particulière à la santé mentale et aux comportements addictifs revêt une importance capitale. Les interventions devraient adopter une approche multisectorielle, se concentrant spécifiquement sur les mères actives au sein de l'environnement socio-familial des adolescents. Il est également essentiel de prendre en compte la santé mentale, en mettant particulièrement l'accent sur des aspects tels que l'alexithymie et l'anxiété.

Mot clés: Obésité- surcharge pondérale- santé mentale-addiction- adolescents

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INTRODUCTION

Adolescence, a crucial transitional phase in human development, involves significant physical, psychological, and social changes, often setting the foundation for lifelong health behaviors (1).

The increasing prevalence of obesity among adolescents has become a substantial and intricate public health issue (2,3). Its contemporary landscape is marked by a complicated interaction of genetic, environmental, socio-economic, and behavioral factors (4).

Recent studies highlight a growing trend among adolescents, particularly those facing challenges, toward the use of addictive substances such as tobacco, cannabis, and alcohol(5).. Non-substance addictions, such as those related to social media, video games, and cyber addiction, have also been observed (6–8). A substantial body of research supports the notion that overweight adolescents are more susceptible to engage in these risky behaviors (7).

Tunisia is currently undergoing a demographic and epidemiological transition marked by the emergence of non-communicable diseases(9). This shift is accompanied by a concerning increase in the prevalence of these diseases (10,11). Moreover, the changing landscape has influenced the lifestyle choices of young Tunisians, who are progressively adopting Western habits, including reduced physical activity and a high-calorie diet(12). Notably, in 2014, approximately 16.1% of urban Tunisian adolescents were found to be overweight (11). These overweight adolescents often reported a decline in their quality of life and encountered mental health issues (13). Recognizing the serious consequences of this trend, it is imperative to carry out thorough screening for obesity, taking into account its physical and psychological dimensions, and to explore the factors associated with it. Our work aimed to assess the prevalence of obesity in adolescents and to explore the connections between sociodemographic factors, mental health, and obesity/overweight in this demographic group.

METHODS

We conducted a cross-sectional study among high school students in 2018 in the region of Sousse, Tunisia.

A self-administered, anonymous questionnaire in Arabic was distributed during classroom sessions. Anthropometric measurements were obtained through physical examinations made by trained professionals. Body weight was recorded with a portable electronic scale, precise to 100 grams. Height was measured using a portable wall-mounted stadiometer, accurate to 0.5 cm. To ensure an adequate sample size, we aimed for 1095 participants, considering a reported smoking prevalence of 26% (14). This was then increased to 1314 to account for an estimated non-response rate of 20%. We employed a two-stage proportional sampling approach, selecting three delegations within the city of Sousse: Sousse-city, Sousse-Jawhara, and Sousse-Riadh.

To determine the body mass index, we calculated the

ratio of body weight to height squared and expressed in kg/m^2 .

To assess the weight status, data defined by the International Obesity Task Force (IOTF) (15,16).

Based on the criteria of the International Obesity Task Force (IOTF), the BMI threshold values defining overweight and obesity were those proposed by Cole et al (15,16). An adolescent is considered overweight or obese if his/her BMI is equal to or greater than the threshold values for age and gender (15).

Concerning the tobacco use we defined smoker as the consumption of at least one cigarette in the past month(17).

Alcohol consumption, reflecting individuals who had consumed alcohol at least once in their lifetime (18).

Problematic use of Facebook was evaluated utilizing a condensed version of the Bergen Facebook AddictionScale (BFAS) (19), while problematic use of video games was assessed through a translated and validated 21-item videogame addiction scale (20).The presence of anxiety disorder was determined using the SCARED-Cscale (21). Depression was evaluated with the Arabic version of the "Beck Depression Inventory-II" scale (BDI-II scale) (22). Additionally, alexithymia was measured using the validated "The twenty-item Toronto Alexithymia Scale," and self-esteem was assessed by the Rosenberg Self-esteem Scale (RSE) (23).

Statistical analysis:

We used SPSS software version 11 to analyze the data. To compare percentages and means among independent samples, we employed the chi-squared (χ^2) test and Student's t-test, as appropriate. For multivariate analysis, we conducted binary logistic regression, where the dependent variable was coded as 1 for "yes" and 0 for "no" to indicate the presence of overweight. The results concerning the risk associated with overweight were reported as adjusted odds ratios (aOR) along with their corresponding 95% confidence intervals.

Ethical consideration:

The research protocol, questionnaire, and consent form were approved by the ethics committee at "Farhat Hached" University Hospital in Sousse. We also obtained written consent from the parents of the students before collecting data, and the students had the choice to participate or not. Importantly, our study posed no risks to the participants.

RESULTS

Our sample consisted of 1,399 students, with a response rate of 89.9%. We observed a female predominance making up 60.5% of the total (with a sex ratio=0.65).The average age was 17 ± 1.5 years. Among the participants, 38.2% fell within the 14-16 age group, while 37.1% were older than 17 years (table 1).

Nearly one-quarter of the students were in their fourth year of secondary school, and 26.3% were in their first year, with 29% of them having experienced repeating a year.

In terms of parental occupation, approximately one-third

of the students' fathers were employed as state officers, while half of the students' mothers were homemakers. Regarding parental education, 41.6% of the participants' fathers held university degrees, along with 36.5% of the

participants' mothers. Details of the sociodemographic characteristics of the study population can be found in Table1.

Table 1. Sociodemographic Characteristics and Their Association with Weight Status among Participants in Sousse High Schools during 2018

		Total	Normal weight n (%)	Overweight n (%)	OR (IC95%)	p
Gender	Female	846(60.5)	592(70)	254(30)	1.41(1.10-1.82)	p=0.006
	Male	553(39.5)	424(76.7)	129(23.3)		
Level of Education	1st year	368(26.3)	261(25.7)	107(27.9)	-	0.209
	2nd year	304(21.7)	231(22.7)	73(19.1)	0.77(0.55-1.09)	
	3rd year	354(25.3)	264(26.0)	90(23.5)	0.83(0.60-1.16)	
	4th year	373(26.7)	260(25.6)	113(29.5)	1.06(0.77-1.45)	
Repeating a Grade	Yes	992(29.1)	291(28.6)	116(30.3)	1.08(0.83-1.39)	0.546
	No	407(70.9)	725(71.4)	267(69.7)		
Mother's Education Level						0.005
	Illiterate or Primary	390(28.1)	307(30.4)	83(21.8)	-	
	Secondary	491(35.4)	350(34.8)	141(37.1)	1.49(1.09-2.04)	
	Higher Education	506(36.5)	350(34.8)	156(41.1)	1.65(1.21-2.24)	
Father's Education Level						0.666
	Illiterate or Primary	330(23.8)	244(24.2)	351(34.9)	-	
	Secondary	480(34.6)	351(34.9)	129(33.9)	1.05(0.80-1.49)	
	Higher Education	576(41.6)	411(40.9)	165(43.2)	1.14(0.88-1.60)	
Mother's Occupation						0.030
	Homemaker	703(50.8)	523(52.1)	180(47.4)	-	
	Manual Worker	121(8.7)	92(9.2)	29(7.6)	0.94(0.60-1.48)	
	Self-Employed	106(7.7)	64(6.4)	42(11.1)	1.97(1.28-3.01)	
	State officers	328(23.7)	234(23.3)	94(24.7)	1.20(0.89-1.62)	
	Manager/Executive	125(9.1)	90(9.0)	35(9.2)	1.16(0.76-1.79)	
Father's Occupation						0.946
	Unemployed	129(9.6)	93(9.5)	36(9.9)	-	
	Manual Worker	211(15.7)	157(16.0)	54(14.9)	0.88(0.52-1.41)	
	Self-Employed	377(28.0)	270(27.5)	107(29.5)	1.02(0.65-1.62)	
	State officers	399(29.7)	294(29.9)	105(28.9)	0.92(0.60-1.49)	
	Manager/Executive	229(17.0)	168(17.1)	61(16.8)	0.94(0.56-1.53)	

The average BMI in our sample was 22.7±4.1 kg/m². According to the International Obesity Task Force (IOTF) criteria, 20.4% of the participants were classified as overweight (95% CI: 18.3%–22.3%), and 7% were classified as obese (95% CI: 5.6%–8.4%). This means that the overall prevalence of weight excess was 27.4% (95% CI: 25.0%–29.7%).

Girls had a higher prevalence of weight excess compared to boys, with 30% of girls being in the weight excess category as opposed to 23.3% of boys. This gender difference was statistically significant (OR=1.41; 95% CI: 1.10-1.82; p=0.006) (table1).

When considering addictive behaviors, we noticed a significant association between the consumption of at least one of the three forms of smoking and weight status (OR=0.67; 95% CI: 0.49-0.92; p=0.014) (table 2). In contrast, tobacco use did not differ between the obese/overweight group (13.1%) and the normal weight group (p=0.48).

A significantly higher level of problematic Facebook use was observed in the normal weight group compared to the overweight-obese group (17.6% vs. 12.8%, p=0.02). A similar trend was noted for video gaming, although it was

not statistically significant (p=0.09) (table 2).

Regarding mental health, several observations were made. Anxiety was significantly more frequent among students with overweight or obesity compared to those with normal weight (p=0.006) (table 2). Additionally, the prevalence of potentially moderate to severe depression was slightly higher among obese or overweight students compared to those with normal weight, but this difference did not reach statistical significance (p=0.169). It's worth noting that no significant differences were observed in terms of alexithymia and self-esteem among students with varying weight statues (table 3).

After conducting a multivariate analysis, we identified several factors associated with overweight and obese adolescents. Specifically, these factors included the mother's self-employment (aOR=2.13, p<0.001), regular physical activity (aOR=0.61, p<0.001), internet usage time ≥2 hours (aOR=0.70, p=0.045), consumption of the recommended 5 fruits and vegetables per day (aOR=1.51, p=0.003), possible alexithymia (aOR=1.55, p=0.018), probable and very probable anxiety (aOR=1.28, p=0.007; aOR=1.61, p=0.037), and problematic use of Facebook (aOR=0.67, p=0.006)(table 3).

Table 2. Weight Status Association with Lifestyle Habits, Addictive Behaviors, and Mental Health of participants in Sousse High Schools during 2018

		Normal Weight n(%)	Overweight n(%)	OR (IC95%)	p
Regular Physical Activity	Yes	449(45.1)	128(33.9)	0.62(0.49-0.79)	<0.001
	No	546(54.9)	250(66.1)	-	
Time Spent on the Internet per Day	< 2 hours	137(14.5)	73(20.3)	-	0.011
	≥ 2 hours	806(85.5)	286(79.7)	0.66(0.50-0.90)	
Consumption of 5 fruits and vegetables/day	Yes	312(31.3)	144(37.9)	1.34(1.05-1.71)	0.021
	no	684(68.7)	236(62.1)	-	
Fast Food Consumption	Less than 3 days/week	744(74.6)	291(77.0)	0.88(0.74-1.25)	0.401
	3 days or more/week	253(25.4)	87(23.0)	-	
consumption of at least one of the 3 forms of smoking	Yes	215(22.5)	60(16.3)	0.67(0.49-0.92)	0.014
	No	741(77.5)	307(83.7)	-	
E-Cigarettes	Yes	132(13.5)	40(10.8)	0.77(0.53-1.12)	0.178
	No	844(86.5)	331(89.2)	-	
Hookah	Yes	116(11.8)	32(8.5)	0.69(0.46-1.05)	0.083
	No	868(88.2)	344(91.5)	-	
Drug use	Yes	76(7.5)	22(5.8)	1.33(0.81-2.16)	0.259
	No	936(92.5)	359(94.2)	-	
Alcohol consumption	Yes	100(9.9)	40(10.5)	1.06(0.72-1.57)	0.754
	No	907(90.1)	341(89.5)	-	
Facebook use	Problematic	179(17.6)	49(12.8)	0.69(0.49-0.96)	0.029
	Non problematic	837(82.4)	334(87.2)	-	
Video gaming	Problematic	372(36.6)	122(31.9)	0.81(0.63-1.04)	0.097
	Non problematic	644(63.4)	261(68.1)	-	
Depression	Moderate to Severe	428(42.1)	177(46.2)	1.18(0.93-1.49)	0.169
	Minor or Absent	588(57.9)	206(53.8)	-	
Anxiety Disorder	No	351(34.5)	99(25.8)	-	
	Possible	195(19.2)	76(19.8)	1.38(0.98-1.95)	0.006
	Very probable	470(46.3)	208(54.3)	1.57(1.19-2.07)	
Alexithymia	No	300(29.5)	91(23.8)	-	0.036
	Possible	234(23.0)	109(28.5)	1.54(1.11-2.13)	
	Very probable	482(47.4)	183(47.8)	1.25(0.94-1.67)	
Self esteem	Week	361(35.5)	147(38.4)	-	0.611
	Moderate	425(41.8)	154(40.2)	0.90(0.51-1.01)	
	High	230(22.6)	82(21.4)	0.87(0.24-1.35)	

Table 3. Multivariate study of factors associated with overweight among participants in secondary schools in the Sousse region during 2018

	OR _a	IC95% OR _a	P	
Regular physical activity	0.61	0.47-0.80	<0.001	
Consumption of 5 fruits and vegetables per day	1.51	1.15- 1.97	0.003	
Mother's occupation	Homemaker		0.022	
	Worker	1.01	0.62-1.64	0.971
	Self-employed	2.13	1.35-3.35	<0.001
	State officer	1.23	0.90-1.68	0.196
	manager / executive	1.02	0.64-1.60	0.942
Alexithymia	No		0.061	
	Possible	1.55	1.07-2.22	0.018
	Very probable	1.27	0.88-1.81	0.196
Anxiety	No		0.024	
	Probable	1.28	0.87-1.89	0.007
	Very probable	1.61	1.14- 2.26	0.037
Problematic use of Facebook	0.67	0.50-0.89	0.006	
Internet usage time ≥ 2 hours	0.70	0.50-0.99	0.045	

DISCUSSION

The surging occurrence of obesity among adolescents in this decade is emerging as a significant and pressing public health plight (1). Our study focused on determining the prevalence of overweight and obesity, as well as understanding the connections between sociodemographic factors, mental health, and obesity. A cross-sectional study was conducted with 1,399 participants, revealing that 27.4% were overweight, 20.4% were classified as overweight, and 7% as obese. Our findings showed that girls had a significantly higher prevalence of excess weight compared to boys. In the multivariate analysis, key factors associated with excess weight included maternal profession, physical activity, fruit and vegetable consumption, Facebook use, anxiety and alexithymia .

Despite the scarcity of national data in terms of obesity rates among adolescents, there are some insightful Tunisian studies that have documented this pressing public health concern over the course of several years.

In 2005, a national study conducted by Aounallah Skhiri et al. (24) involving 2,872 adolescents aged 15 to 19 years unveiled comparatively lower prevalence rates of overweight and obesity when juxtaposed with the findings of our present study. The respective prevalence figures stood at 19% and 4.3% using WHO/NCHS criteria and 15% and 2.6% using IOTF references (24). Boukthir et al.(25) embarked on a descriptive study comprising schoolchildren in Tunis, ranging in age from 6 to 12 years during the year 2011 (25). The prevalence of overweight was recorded at 19.7%, with obesity standing at 5.7% as per IOTF criteria (25). Meanwhile, the Obesity-Metabolic Syndrome Research Unit in Sfax undertook a study in 2010-2011 aimed at ascertaining the prevalence of overweight and obesity among a cohort of school-age children aged 9 to 12, residing in the city of Sfax (26). In accordance with IOTF criteria, this study reported prevalence figures lower than those in our study, with obesity recorded at 2.4% and overweight at 6.3% (26). Globally, the WHO reported that the current prevalence is ten times higher than in the 1970s, reaching 213 million children and adolescents aged 5 to 19 in 2016 (27). The current prevalence of excess weight in adolescents varied globally(28). High-prevalence countries (exceeding 20%) included developed countries like those in North America(28). As well as some developing countries in the Middle East (Kuwait, Egypt, Lebanon) (28). Our findings indicate that 27.4% of adolescents in our study were overweight, placing Tunisia among high-prevalence countries. This difference could be attributed to the fact that in some Middle Eastern countries, socioeconomic, behavioral, and cultural beliefs supported the increase of obesity(29)

According to our study, overweight was significantly associated with gender. Our study identified a predominance of overweight among females. This female preponderance our findings align with past trends but oppose the current global trajectory(4). The World Health Organization (WHO) report published in March 2023 for the European regions, overweight and obesity are more common among boys(4). In total, the prevalence of overweight and obesity is 31% among boys and 28% among girls. Among the 16 countries that collected data through the COSI Initiative for multiple age groups, the prevalence of obesity increases with age among boys(4). Additionally, the distribution of excess weight by gender have been observed in different countries, including Saudi Arabia (30), Italy (31), the Islamic Republic of Iran (30), Kuwait (30), and others, where prevalence rates were higher in boys than in girls.

Similar to our distribution several epidemiological studies conducted worldwide in the last decade, have consistently shown a tendency toward higher rates of overweight among adolescent females (32).

Consistent with our study, the NHANES I study conducted in the United States by Must et al. (33) found that obesity was more prevalent among adolescent girls. These variations in prevalence between genders across different populations can be attributed to cultural, socio-demographic, and economic factors (34).

Our research uncovers a noteworthy link between

maternal employment and childhood obesity. Despite the societal advantages of maternal employment, our findings suggest a doubling of obesity risk in children when mothers work as freelancers or managers. The literature supports the idea that time constraints on working mothers may impact their ability to oversee healthy meals, potentially resulting in increased consumption of processed foods by children(35). Furthermore, extended maternal work hours have been linked to increased BMI in offspring, likely due to decreased opportunities for physical activity and parental supervision over dietary choices(36).

Our study, after multivariate analysis, demonstrated a relationship between problematic Facebook use and excess weight. This may be explained firstly by Body Image Concerns. Adolescents with obesity may experience heightened concerns about body image, potentially leading to a decreased interest in or avoidance of social media platforms where body image is often emphasized(37). Faced with likely dissatisfaction with their body image, overweight adolescents may avoid posting photos on Facebook (selfies) and consequently use Facebook less(38). Also for obese adolescents searching for weight loss guidance on Facebook, benefit from the algorithm's focus on success stories, exercise routines, and healthy food choices. This curated content, while not encompassing the full spectrum of weight loss experiences, can still indirectly raise awareness about healthy living(39).

Other studies have established a positive relationship between time spent on Facebook and weight gain(40). In secondary schools, the use of "social media" (Instagram, Facebook), time spent watching television, and time spent playing video games by children were significantly related to weight status(38,40). At the same time, Griffiths et al. (41) mentioned that obesity is linked to victimization and social isolation.

Our study revealed that approximately half of overweight adolescents exhibited a high likelihood of anxiety, with significantly higher overall anxiety scores compared to those with normal weight (42). These findings align with Pinhas-Hamiel et al.'s observations, where they found no statistically significant relationship between BMI and depressive symptoms in obese adolescents (43). In contrast, a meta-analysis of 17 studies concluded that depression is positively associated with a high BMI (44). Regarding the link between anxiety, very probable alexithymia, and overweight, other studies have reported results similar to ours (45,46). Morales et al. found a higher prevalence of these factors among overweight youth compared to those with normal weight (46). Overweight youth in the United States reported more anxiety symptoms than their normal-weight peers (47). Delvin et al. suggested that obesity affected individuals with mental disorders and serious mental illnesses, particularly anxiety disorders and alexithymia (48).

Obese or overweight children are at a significant risk of low self-esteem, depression, and anxiety (49). Moreover, they are exposed to discrimination and stigma, which can result in isolation, reduced physical activity, and worsened overweight (49).

Conversely, mental health issues could lead to obesity, especially in cases of depressive syndrome, where psychomotor slowing and associated appetite disturbances contribute to weight gain (50). Similarly, anxiety disorders, such as panic disorder, agoraphobia, or social phobia, can lead to weight gain due to social isolation, inactivity, and avoidance behaviors (50). In a literature review, McElroy et al. concluded that certain medications prescribed for mental health issues could lead to weight gain (51). Obese children and adolescents were more likely to develop mood disorders and bipolar disorders diagnosed in adulthood (42).

At the closure of our analysis, it's crucial to consider some methodological factors when interpreting our findings. The cross-sectional design limits establishing causal relationships, highlighting the need for future longitudinal and qualitative investigations. Despite this limitation, the robust sample size and random selection method support sample representativeness. The questionnaire, in Arabic, underwent rigorous pre-testing and anonymous self-administration to ensure comprehension and minimize under-reporting. These measures enhance the statistical power of our study and reduce potential biases.

CONCLUSION

Gaining insights into the factors associated with excess weight in our social and cultural context can assist public health stakeholders, including primary care physicians, in formulating a comprehensive strategy for preventing excessive weight. It's imperative to address mental health issues and addictive behaviors, recognizing their significance in this context. Intervention effort should not be confined to individual approaches but should encompass the child's socio-familial environment in a multi-sectoral approach.

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