Is Obesity a Risk Factor of Bullying at Intermediate School?

Salma Abedelmalek[1] , Halima Adam[2], Sultan Alardan[1], Sami Yessine[2], Nizar Souissi[3], Hamdi Chtourou[4]

[1] Department of Sport Science and Physical Activity, College of Education, University of Ha'il, Hail, Saudi Arabia
[2] Department of Psychology, College of Education, University of Ha'il, Hail, Saudi Arabia
[3] Research Unit Physical Activity, Sport and Health (UR18JS01), National Observatory of Sports, Tunis AND High Institute of Sport and Physical Education, Ksar-Saïd, Manouba University, Manouba, Tunisia
[4] High Institute of Sport and Physical Education of Sfax, University of Sfax, Sfax AND Research Unit Physical Activity, Sport and Health (UR18JS01), National Observatory of Sports

Corresponding Author: Salma Abedelmalek; *Department of Sport Science and Physical Activity, College of Education, University of Hail, Hail, Saudi Arabia AND Laboratory of Physiology and Functional Explorations, School of Medicine, Sousse, Tunisia*
Email: salmamalek@yahoo.com

Quantitative Study

Abstract

Background: Bullying is aggressive behavior carried out by an individual or a group of people against another person or another group. This study was conducted to assess the prevalence of bullying related to obesity among intermediate school pupils.

Methods: In the Ha'il region of Saudi Arabia in the year 2022, a cross-sectional study was conducted at governmental intermediate schools. The study involved 1089 students (566 girls and 523 boys) who successfully completed the research out of an initial total of 1275 students. About 10% of the initial sample was excluded due to missing data, 5% because of bullying unrelated to obesity, and 2% due to experiencing bullying outside of the school setting. Statistical analyses were carried out using the SPSS® software. To discern differences among bullying groups across various variables, one-way and two-way repeated measures analysis of variance (ANOVA) were used. The correlation between body mass index (BMI) and bullying was assessed using bivariate Pearson's product-moment correlation to check for collinearity. All statistical tests were two-sided, and a type I error (α) of 0.05 was applied.

Results: A positive correlation between BMI and bullying (r = 0.058; P = 0.040) was reported. The overall rate of bullying was 31% with the most prevalent type of bullying being verbal (77.5%) followed by physical (14.8%) and social (7.7%). Moreover, students of 15 years of age were more at risk of being bullied than their peers (12.4%). However, no significant difference related to sex or educational level variables was reported. Moreover, the results indicated that 94% of the students who were bullied did not get enough sleep (> 7 hours; P < 0.001). ANOVA indicated that 86.9% of students experiencing bullying resort to eating when facing stress and tension. Additionally, 52% of bullied students exhibit irregular eating habits, foregoing regular meals.

Conclusion: In the present study, a high prevalence rate of bullying related to obesity among schoolchildren was reported. Therefore, mandatory serious efforts should be undertaken in the region by educational staff (i.e., teachers), health care providers, and

decision-makers to deal with the problem. Additionally, health programs need to be endorsed in schools for the prevention and management of childhood obesity in the region.

Keywords: Bullying; Obesity; Adolescent

Introduction

The public health of children and adolescents in developing and developed countries is facing a major challenge represented by the high rates of obesity (Mechraoui et al., 2023; Robinson et al., 2017). Althumiri et al. (2021) conducted a survey in Saudi Arabia to identify the prevalence of obesity among the population and it was found that 21.7% suffer from increased body mass index (BMI; ≥ 30), and that 20.1% of the population of the Ha'il region, where the current study is conducted, suffer from obesity. In a more recent study, Abedelmalek, Adam, Alardan, Yassin, Chtourou, and Souissi (2022) found that Ha'il City has a 52.1% prevalence of obesity, and this is associated with factors such as lack of physical activity, disrupted sleep, and unhealthy eating habits. Understanding the risk factors for obesity in the early years is crucial to the development of preventive plans and programs, and the development of interventions provided by parents, educational staff, and those concerned with mental and physical health issues of children and adolescents (Wright, 2021).

The most prominent effects of obesity on the health of individuals are its association with numerous chronic diseases (Lee, Jeong, & Roh, 2018). Moreover, obesity has numerous psychological effects, including problems of low self-confidence and self-esteem, psychological disorders related to mood and emotional aspects such as anxiety and depression, in addition to eating disorders, social isolation, and low educational attainment (Lee et al., 2018). In children and adolescents, the body is positively associated with the inability to manage emotions and control impulsive behavior, in addition to weak cognitive functions such as attention (Pan, Li, Feng, & Hong, 2018). Several factors are involved in the prevalence of obesity among children, including a diet that relies on excessive consumption of fast food and drinks that depend on sugar and fats (Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003). A previous study showed an association between obesity and the time children and adolescents spend playing video games or using computer and Internet applications (Vicente-Rodriguez et al., 2008). Excessive media exposure reduces physical activity and increases food consumption (Strasburger, 2011). Overweight and obese school-aged children have both psychological and physical symptoms (Aljaadi & Alharbi, 2020), and experience negative body image and bullying (Jansen et al., 2016).

Although negative appreciation of obese individuals has been well documented (Alsaleem, Alhashem, Alsaleem, & Mahfouz, 2021), the relationship between bullying and obesity has received little attention in the past decade (Brixval, Rayce, Rasmussen, Holstein, & Due, 2012). Evidence suggests that adolescents who are overweight or obese are more likely to be bullied at school than to be abused for other reasons (e.g., race, religion, or disability) (Krukowski, West, Philyaw, Bursac, Phillips, & Raczynski, 2009). In an earlier investigation, Strauss and Pollack (2003) highlighted that adolescents between the ages of 13 and 18 who were overweight had a higher likelihood of experiencing psychosocial issues and social isolation. Additionally, these overweight adolescents were found to be more susceptible to verbal abuse from their peers (Rankin et al., 2016). In addition, weight-based bullying in overweight or obese children and adolescents may contribute not only to peer rejection and academic failure (Puhl & Heuer, 2009), but also to negative effects such as increased risk of disordered eating behaviors and limited physical activity. A meta-analysis showed that both overweight and obesity among young people are risk factors for being a victim of bullying with no difference between boys and girls (van Geel, Vedder, & Tanilon, 2014). Certain types of peer victimization, often

referred to as bullying, include physical, verbal, and relational/social types (Alsaleem et al., 2021). A Brazilian national survey showed that school students reported being bullied by their peers because of their excess weight, and that 46% of students aged 11 to 15 years experienced bullying due to an increased BMI (Russo, 2020).

Data regarding bullying among adolescents in the Ha'il region are lacking. Therefore, it is crucial to examine bullying to minimize children's and adolescents' mental health problems and difficulties in adulthood. The aim of the current study was to assess bullying related to obesity or overweight among intermediate students in Ha'il region, Saudi Arabia.

The high prevalence of obesity (Abedelmalek et al., 2022a) and the commonness of bullying in school call for research to address this knowledge gap. The purpose of this study was to examine whether obesity predicts the bullying among students aged 11 to 15 years. We hypothesized that students with a high BMI are more vulnerable to bullying.

Methods

Study design and participants: This cross-sectional study encompassed 1089 adolescents, randomly chosen from various schools in Ha'il city, Kingdom of Saudi Arabia. The inclusion criteria comprised students in selected classes who were in good health and devoid of physical deformities. Spanning four months, from January to April 2022, the study obtained consent from schools and approval from both students and their parents. Assurances were given to participants that their data would be solely utilized for research purposes. Adhering to Google's privacy policy (https://policies.google.com/privacy?hl=en), participant responses were treated as anonymous and confidential. Participants had the autonomy to discontinue the study and exit the questionnaire at any point before submission, using only the "submit" button to save responses. By completing the survey, participants expressed their voluntary consent. Honesty in responses was strongly encouraged (Ammar et al., 2020).

Sample Size: A total number of 1275 students were assessed for eligibility. A 10% exclusion from the study occurred due to missing data, 5% due to bullying unrelated to obesity, and 2% due to incidents of bullying outside the school context. This cross-sectional study involved 1089 healthy adolescents (566 girls and 523 boys) aged 12–16 years, who were Saudi students without disabilities or physical deformities. The participants were randomly selected from various schools in Ha'il, a city situated in the eastern borders region of the Kingdom of Saudi Arabia.

Instruments and variable: Anthropometric measurements were conducted in the morning by a skilled researcher following written standardized protocols. Body weight was assessed using a digital scale (Tanita Corporation, Tokyo, Japan) with a precision of 0.1 kilogram. Height was measured to the nearest centimeter while the subject stood fully upright (Frankfort horizontal plane) without shoes utilizing a calibrated portable stadiometer. BMI was computed as the ratio of weight in kilograms to the square of height in meters. A pre-structured questionnaire was used which collected information regarding demographic characteristics (i.e., sex, age, and educational level) and daily leisure activities (i.e., PlayStation, and exercise practice). The participants were also asked about their exposure to bullying and the reason for it (Table 1). The Arab Teens Lifestyle Study (ATLS) research tool was employed to gather lifestyle information, specifically focusing on the initial 5 items requiring measurement/recording. The reliability of the Arabic version was assessed, yielding a Cronbach's alpha of 0.725.

Table 1. The characteristics of the study sample (n = 1089)

Category		n (%)	Mean ± SD
Sex	Boys	523 (48.0)	29.27 ± 10.12
	Girls	566 (52.0)	27.38 ± 9.27
Educational level	First	467 (42.9)	27.66 ± 9.677
	Second	366 (33.6)	28.51 ± 9.60
	Third	256 (23.5)	29.08 ± 9.96
Age	12	193 (17.7)	26.60 ± 9.42
	13	302 ()27.7	28.70 ± 9.71
	14	370 (34.0)	28.35 ± 9.57
	15	207 (19.0)	28.90 ± 10.01
	16	17 (1.6)	30.19 ± 11.97
BMI	Normal	478 (43.9)	29.82 ± 9.34
	Overweight	137 (12.6)	29.75 ± 10.24
	Obesity	474 (43.5)	26.30 ± 9.62
Bullying	Yes	337 (40.0)	27.44 ± 9.44
	No	752 (60.0)	28.67 ± 9.84

BMI: Boy mass index; SD: Standard deviation

Only sleep data were scrutinized and presented, defining insufficient sleep as less than 7 hours per night based on the National Sleep Foundation's criteria for the adolescent population (National Sleep Foundation, 2020). For dietary information, the Self-Report Diet Questionnaire, using NutriCalc questionnaire (2020), was utilized. This questionnaire was designed to explore eating and food habits, such as the number of meals per day, stress eating, and weekly consumption of fast food. In this study, emphasis was placed on items pertaining to stress eating for methodological reasons.

Analysis: Descriptive statistics were calculated to characterize the percentage of responses for each question and the overall distribution in the total score of each questionnaire. All statistical analyses were performed using the SPSS® software (version 20.0; IBM Corp., Armonk, NY, USA). The normality of data distribution was confirmed through the Shapiro–Wilk test. Results were calculated and presented as mean ± SD (standard deviation) and frequency counts (%) for all variables. A t-test was used to determine the difference between the means. To identify the differences between bullying groups according to all variables, one-way and two-way repeated measures analysis of variance (ANOVA) were used. The Mann-Whitney U test was performed to analyze the differences in bullying according to life activities variables. The Tukey's post hoc test was conducted in cases where significant effects or interactions were observed.

Linear regression was employed to ascertain the nature and strength of the relationship between bullying and obesity. The collinearity between BMI and bullying was assessed through the calculation of the bivariate Pearson's product-moment correlation (r). All statistical tests used were two-sided with a type I error (α) of 0.05.

Ethics: All official authorizations necessary to conduct this study were obtained. The project was approved by the research ethical committee of Ha'il University (RG-20 171).

Results

Prevalence of bullying: Concerning the prevalence of bullying among schoolchildren (Figure 1), the t-test showed that 40% of students were bullied (t = 3447.07; P < 0.0001) (Table 2). Moreover, Pearson's correlation test reported a positive correlation between BMI and bullying (r = 0.058; P = 0.040; Table 3).
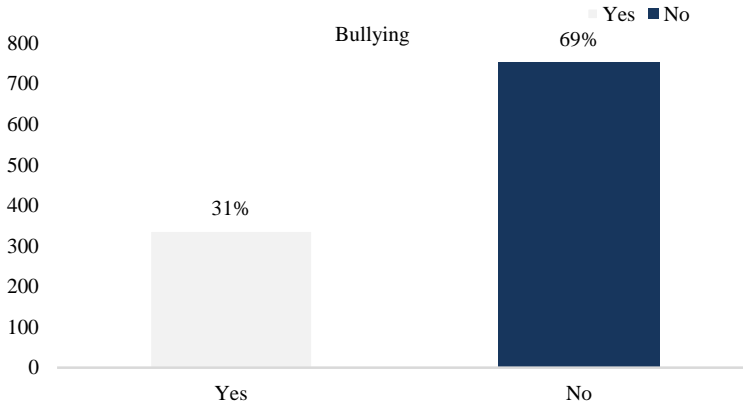
Figure 1. Percentage of middle school students being bullied

Table 2. The prevalence of bullying among the study sample (n = 1089)

Category		n	Mean ± SD	df	t	P-value
Bullying	Yes	337	69.00 ± 0.462	1	-3447.074	< 0.001
	No	752		1087		

df: Degree of freedom; SD: Standard deviation

Linear regression standards were used to determine whether it is possible to predict bullying through BMI. The results of the regression indicated that the two predictors explained 37.4% of the variance [R^2 = 0.37; F = (1,108) = 652.2; P < 0.0001]. It was found that BMI significantly predicted bullying (β = 1.23; t = 25.53; P < 0.010; Table 4). Obese students were more exposed to bullying, according to BMI with a percentage of 28.1% (Table 5). The most prevalent type of bullying was verbal (77.5%), followed by physical (14.8%) and social (7.7%) types (Figure 2).

Differences in bullying by demographic variables: In the assessment of the differences in bullying by demographic variables, t-test and ANOVA revealed no significant differences in terms of sex (t = -1.160; P = 0.246) (girls: 1.67 ± 0.47 and boys: 1.70 ± 0.45; Table 6). In addition, no significant difference was observed in terms of educational level (1.80 ± 0.79; F = 0.428; P = 0.652). However, a significant difference in terms of the age variable was observed (13.58 ± 1.03; F = 2.75; P = 0.018). In fact, a high level of bullying was observed in students in the 15-year-old group (Table 7).

Table 3. Relationship between increased BMI and bullying

R	R Square	Adjusted R Square	SE of the Estimate	P-value
0.058	0.003	0.003	0.46190	0.040

SE: Standard error

Table 4. The linear regression between BMI and bullying

Model Summary[b]								
Model	R	R Square	Adjusted R Square	SE of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	F Change (P-value)
1	0.612[a]	0.375	0.374	0.73983	0.375	652.249	1	1087	0.000

a. Predictors: (Constant), Bullying
b. Dependent Variable: BMI
df: Degree of freedom; SE: Standard error

Table 5. Differences in bullying according to BMI in the study sample (n = 1089)

Category		Normal	Overweight	Obesity
		(n/%) /Mean ± SD	(n/%) /Mean ± SD	(n/%) /Mean ± SD
Bullying	Yes	(19/1.74) 1.31 ± 0.47	(12/1.10) 1.41 ± 0.51	(306/28.10) 1.46 ± 0.49*
	No	(459/42.14) 1.49 ± 0.50	(125/11.47) 1.51 ± 0.50	(168/15.42) 1.48 ± 0.50*

*(P < 0.05): significant difference compared to normal and overweight students
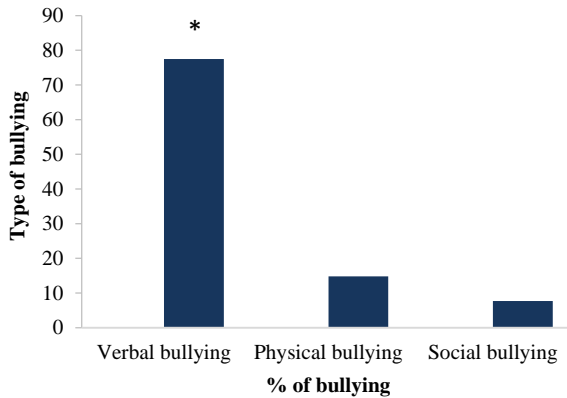SD: Standard deviation

Figure 2. The percentage (%) of different types of bullying (i.e., verbal, physical, and social) of the study sample (n = 1089)
*(P < 0.05): significant difference compared to physical and social bullying

Differences in the bullying according to life activities variables: Concerning the differences in bullying according to life activities variables, the Mann-Whitney U test showed significant differences related to exercise practice with a high average observed in students who answered "No" (U = 83108; P < 0.0001; Figure 3). The lower the practice of physical exercise was, the more obese the students were, with a percentage of 38% (Table 8).

For the PlayStation variable, a significant difference was observed (U = 90819; P < 0.0001). It was reported that 87.5% of students (n = 337) who were bullied spent their time playing with the PlayStation (Table 9).

Table 6. Differences in bullying according to sex in the study sample (n = 1089)

Category		Mean ± SD	df	t	P-value
Sex	Girls	1.60 ± 0.46	1	-1.160	0.246
	Boys	1.70 ± 0.45	1087		

df: Degree of freedom; SD: Standard deviation

Table 7. Differences in bullying according to educational level and age of the study sample (n = 1089)

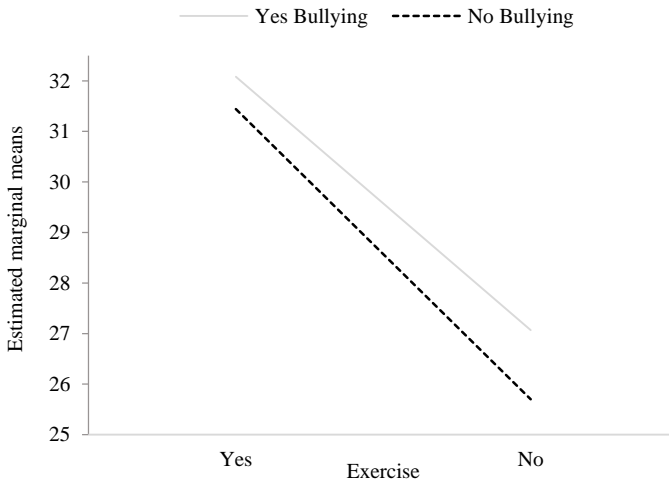| Category		Sum of squares	Mean of square	df	F	P-value
Educational level	Between Groups	0.183	0.092	2	0.428	0.652
	Within Groups	232.529	0.214	1086		
	Total	232.713		1088		
Age	Between Groups	2.920	0.584	5	2.753	0.018
	Within Groups	229.792	0.212	1083		
	Total	232.713		1088		

df: Degree of freedom

Figure 3. Differences in bullying according to exercise practice

Differences in Bullying Based on Sleep Patterns: The findings revealed that 423 students had sleep duration of less than 7 hours, while 666 students reported obtaining sufficient sleep (more than 7 hours, as shown in Table 10). Among the students who experienced bullying, 319 had sleep duration of less than 7 hours, and only 19 students reported sleeping more than 7 hours.

The results highlight that 94% of students who faced bullying did not get adequate sleep (less than 7 hours). There are statistically significant differences in bullying according to the variable of hours of sleep (M = 27.31 ± 9.51) (F = 1549.52; P = 0.0001) (Table 11).

Differences in Bullying Based on Eating Habits: Table 12 presents the variables related to dietary habits. The one-way ANOVA indicated that students who affirmed waking up at night to eat were the most susceptible to bullying, constituting approximately 88.13% of the total participants experiencing bullying (27.14 ± 9.49; F = 429.77; P = 0.0001). The divergences between results demonstrated that individuals facing bullying tend to consume food when experiencing elevated stress and tension, making up 86.9% of the total students exposed to bullying (26.89 ± 9.39; F = 341.42; P = 0.0001).

Table 8. Description of exercise practice according to BMI of the study sample (n = 1089)

Category		Normal	Overweight	Obesity
		(n/%) /Mean ± SD	(n/%) /Mean ± SD	(n/%) /Mean ± SD
Exercise	Yes	(281/25.80) 30.95 ± 9.20	(71/6.51) 33.17 ± 10.19	(60/28.10) 31.95 ± 10.18[*]
	No	(197/18.10) 28.22 ± 9.27	(66/6.06) 26.07 ± 8.99	(414/38.10) 25.48 ± 9.26[*]

[*](P < 0.05): significant difference compared to normal and overweight students
SD: Standard deviation

Table 9. Differences in bullying according to life activities variables of the study sample (n = 1089)

Categories		n	Mean Rank	Sum of Ranks	Mann-Whitney U	P-value
Exercise	Yes	412	681.78	280894.00	83108.000	< 0.001
	No	677	461.76	312611.00		
Play Station	Yes	639	462.13	295299.00	90819.000	< 0.001
	No	450	662.68	298206.00		

Table 10. Description of sleep pattern according to bullying of the study sample (n = 1089)

Category		Yes Bullying	No Bullying
		(n/%) /Mean ± SD	(n/%) /Mean ± SD
Sleep	Less than 7 hours	(319/29.29) 27.31 ± 9.51*	(104/9.55) 26.10 ± 10.73
	More than 7 hours	(18/1.65) 29.63 ± 7.97*	(648/59.50) 29.07 ± 9.63

*(P < 0.05): significant difference compared to no bullied students
SD: Standard deviation

Table 11. Differences in bullying according to sleep pattern of the study sample (n = 1089)

Category		Sum of Squares	df	Mean Square	F	P-value
Sleep	Between groups	136.769	1	136.769	1549.529	< 0.001
	Within groups	95.944	1087	0.088		
	Total	232.713	1088			

df: Degree of freedom

Out of 467 students reporting irregular meal consumption, 178 were found to be bullied. Furthermore, 52% of students who are bullied do not eat their meals regularly (25.80 ± 8.79; F = 20.56; P = 0.0001; Table 13).

Discussion

The present investigation addressed the issue of bullying in children afflicted with obesity, a prevalent health concern among this demographic. The study findings indicated that bullying is widespread among middle school students, affecting 40% of this population. Additionally, it was observed that 15-year-old students experienced a higher prevalence of bullying compared to their counterparts in other age groups. However, bullying is not related to the sex variable. In fact, no differences were observed between girls and boys. These findings were in accordance with previous studies in a number of countries, including Vietnam, where a survey conducted in 2017 revealed that 44.7% of students were bullied (Nguyen, Nakamura, Seino, & Vo, 2020).

Table 12. Description of eating habits according to bullying of the study sample (n = 1089)

Categories		Yes Bullying	No Bullying
		(n/%) /Mean ± SD	(n/%) /Mean ± SD
Eating while stressed	Yes	(293/26.90) 26.89 ± 9.39	(259/23.78) 27.01 ± 9.21
	No	(42/3.85) 31.53 ± 8.95	(492/45.17) 29.51 ± 10.05
Night eating	Yes	(297/27.27) 27.14 ± 9.49	(230/21.12) 26.73± 8.47
	No	(40/3.67) 29.62 ± 8.84	(522/47.93) 29.51 ± 10.27
Eating meals regularly	Yes	(156/14.32) 29.43 ± 9.83	(459/50.41) 29.02 ± 10.17
	No	(178/16.34) 25.80 ± 8.79	(289/26.53) 28.13 ± 9.85

SD: Standard deviation

Table 13. Differences in eating habits according to bullying of the study sample (n = 1089)

Categories		Sum of squares	df	Mean square	F	P-value
Night eating	Between groups	65.939	1	65.939	429.779	< 0.001
	Within groups	166.774	1087	0.153		
	Total	232.713	1088			
Eating while stressed	Between groups	55.489	1	55.489	341.426	< 0.001
	Within groups	176.173	1084	0.163		
	Total	231.662	1085			
Eating meals regularly	Between groups	4.315	1	4.315	20.567	< 0.001
	Within groups	226.583	1080	0.210		
	Total	230.898	1081			

df: Degree of freedom

Biswas et al. (2020) reported that bullying is prevalent among adolescents in the age group of 12 to 17 years (30.5%). In the same context, Alsaleem et al. (2021) reported that 64.7% of school students were exposed to bullying (in Khamis Mushait city, Saudi Arabia). In the present study, the overall rate of bullying was a 31% among intermediate school students in Ha'il city, Saudi Arabia. This discrepancy between studies in Saudi Arabia could be related to the different age groups and school stages studied. In fact, a significant relation was observed between BMI and bullying. In accordance with our results, Janssen, Craig, Boyce, and Pickett (2004) reported that overweight and obese school-aged children are more likely to be the victims and perpetrators of bullying behaviors than their normal-weight peers. In the same context, obese children are more prone than their peers to bullying, depression, anxiety, and stress (Juvonen & Graham, 2014; Ngo et al., 2021).

The results of the current study indicated that no significant differences were observed in bulling according to sex or educational level. However, a significant difference was observed according to the age variable, with a high level of bulling in the 15-year-old group. These findings are in line with those of other studies, which did not identify significant differences in involvement in bullying between genders (Silva, Pereira, Mendonca, Nunes, & de Oliveira, 2013; Povedano, Estevez, Martinez, & Maria, 2012). Accordingly, Garmy, Vilhjalmsson, and Kristjansdottir (2018) found that Icelandic students report being bullied at least 2-3 times per month, and the youngest are the most likely to be bullied.

The findings from the current study suggest that students who refrain from participating in sports activities are at a higher risk of experiencing bullying compared to their peers. This result is consistent with the findings of Ngantcha et al. (2018) who reported that students who spend more than two hours watching TV, playing video games, and on the computer suffer from decreased physical activity and increased rates of exposure to bullying**.** In the same context, Jimenez Barbero, Jimenez-Loaisa, Gonzelez-Cutre, Beltran-Carrillo, Llor-Zaragoza, and Jimenez Barbero et al (2019) indicated the positive effect of physical education on reducing the chances of exposure to school bullying. In addition, Herazo-Beltrán et al. (2019) conducted a cross-sectional study on 991 students between the ages of 7 and 17 in Colombia to determine the relationship between the level of physical activity and bullying. They found that students who either did not engage in physical activity or did so inconsistently were more susceptible to experiencing bullying within the school environment.

The findings suggested that students who experienced bullying tended to have insufficient sleep, sleeping for less than 7 hours. Accordingly, Donoghue and Meltzer (2018) reported that students who were exposed to bullying in physical, psychological, or cyber forms suffered from sleep disorders and had higher rates of insomnia. The literature dealing with bullying among French students in the age group from 10 to 18 years has proven that interrupted sleep and insomnia are a mediating factor in the relationship between aggression and external behaviors among bullies (Hysing, Askeland, La Greca, Solberg, Breivik, & Sivertsen, 2021; Kubiszewski, Fontaine, Potard, & Gimenes, 2014). The sleep disruption can be explained by the fears felt by the victims of bullying which contribute to their inability to fall asleep due to excessive thinking about what they may be exposed to tomorrow, which keeps them awake and unable to sleep or to feel satisfied with it (Astor, Benbenishty, Zeira, & Vinokur, 2002; Randa, Reyns, & Nobles, 2019). Moreover, exposure to bullying at school causes psychological distress to students,

and makes them sleep less than their peers of the same age (Sampasa-Kanyinga, Chaput, Hamilton, & Colman, 2018). The current results revealed that students undergoing bullying encounter challenges associated with their eating habits. They exhibit tendencies to consume food when experiencing stress, wake up at night to eat, and do not adhere to a regular meal schedule. In accordance with previous reports, students who have been exposed to bullying suffer from a high BMI (Brixval et al., 2012), which is often an inevitable result of eating disorders. It is noteworthy that adolescents with obesity eat whenever they feel stressed and do not have a regular feeding regime (Abedelmalek, Aloui, Denguezli, Adam, Souissi, & Chtourou, 2022b). Studies have indicated that those with eating disorders suffer from bullying, and are more likely to develop eating disorders than others (deLara, 2019). Results of several longitudinal studies have shown that being overweight, lack of acceptance of appearance, and poor self-esteem are associated with bullying (Kaltiala-Heino, Rimpela, Rantanen, & Rimpela, 2000; Lunde & Frisen, 2011; Lunde, Frisen, & Hwang, 2006). Bullying is also associated with eating disorders such as gluttony, difficulty controlling food intake, and eating unhealthy food. Moreover, it has been reported that girls who have been bullied suffer from these difficulties three times more often than boys (Lie, Ro, & Bang, 2019; Neumark-Sztainer, Falkner, Story, Perry, Hannan, & Mulert, 2002).

Thus, the stress of being teased and bullied contributes to the search for ways to overcome this stress and the perceived fears associated with the possibility of being bullied again. This can explain, in part, the excessive consumption of foods saturated with fats and fast food, and not following a regular diet that contribute to the exacerbation of health risks such as weight gain and increases bullying.

The strengths of this research project include the evaluation of demographic factors, sleep patterns, eating habits, and life activities and their association with bullying in schoolchildren and adolescents in different schools in Ha'il region, KSA. This study includes different types of bullying. However, the findings of this study have to be seen in light of some limitations. First, the study population is representative of schoolchildren in one region, so the results cannot be applied to all cities in Saudi Arabia. Second, the use of a single-item question regarding the prevalence of bullying may underestimate the phenomena. Another limitation is that the social level of the participants could be a factor that influences the data of the current study.

Conclusion

In the present study, a high prevalence of bullying related to obesity was observed in intermediate schools in the Ha'il region in Saudi Arabia. Therefore, mandatory serious efforts by educational staff (i.e., teachers), health care providers, and decision-makers in the region to deal with the problem are crucial.

Conflict of Interests

Authors have no conflict of interests.

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