

Behaviors and Subjective Health of the Egyptian Adolescent School Children

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Abstract BACKGROUND: There are many concerns nowadays about many issues in adolescent health behavior. This study was conducted to assess the prevalence of dietary habits, physical activity and sedentary behaviors among Egyptian adolescents and to assess how they perceive their physical and emotional health. **METHODS:** The study was cross sectional and was conducted from December 2014 to July 2015 in Menoufia governorate in Egypt. Number of adolescents participating in the study was 329. Their BMI percentile was calculated using a percentile online calculator. A questionnaire about health behaviors of the students and their perception of health was distributed. **RESULTS:** The prevalence of overweight and obesity among students was 18.8% and 10% respectively. Bad dietary and sedentary behaviors were common among them. Poor perception of health and negative feelings were also common. **CONCLUSIONS:** national surveys and health promotion programs are urgently needed to focus on health behaviors of the Egyptian adolescent children.

Keywords: *child and adolescent health, nutrition and diet, school health services*

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1. Background

The concept of health and risk behaviors has emerged as a major issue in the epidemiology literature due to the crucial role behavior and lifestyle play in determining health, illness, disability, and premature mortality [1].

The adolescent period is a unique period influenced by peers, school and the wider society and is characterized by rapid physical and psychological changes. Moreover, adolescence is the peak age of onset for some common mental illness which can make adolescents overloaded, stressed and can lead to actual physical illness [2].

There are many concerns about health of young people nowadays because children and adolescents commonly practice bad health behaviors such as consumption of fast food and excessive amounts of high sugar-containing beverages, lack of physical exercise and increased TV and computer screen time [3]. Moreover, there are recent reports suggesting increases in nutrition-related hazards for chronic disease in children such as hypertension, dyslipidemia and Type 2 diabetes [4].

Because behaviors during developmental years can influence future health risk in later life, young people are thus considered an important target group for early detection of behavior-related problems and health education and health promotion efforts. These efforts aim to help them establish healthy lifestyles and avoid developing health risk behaviors before these behaviors are firmly established [2,5].

One of the health promotion efforts tried in this age is encouraging adolescents to increase their intake from fruits and vegetables, for example, instead of high-fat, sugar and salt products, which is thought to prevent from many health problems such as obesity, diabetes, and cardiovascular diseases [6].

In combination with healthy eating, physical activity is an essential component of a healthy lifestyle in children and adolescents. Regular physical activity helps children and adolescents develop healthy behaviors which they can sustain throughout their lives. Furthermore, participating in regular physical activity increases muscle and bone strength and maintains a healthy weight. It also improves psychological well-being and reduces symptoms of depression and anxiety [7].

To the best of our knowledge, few lifestyle factors have been simultaneously studied and reported for Egyptian adolescents. Therefore, the purpose of the present study was to report on the prevalence of dietary habits, physical activity and sedentary behaviors among Egyptian adolescents and to assess how they perceive their physical and emotional health. Our goal was to provide information to policy makers about the risky behaviors of the Egyptian adolescents in order to be targeted by health promotion programs.

2. Methods

2.1. Study Design

This cross-sectional study was carried out from December 2014 to July 2015 in Menoufia governorate. The sampling

frame included the listed governmental preparatory schools given by the Educational Directorate of Menoufia.

2.2. Study Population and Sampling

A multistage random sampling technique was used. First, Shebin el-kom district was chosen randomly from the 7 districts of Menoufia Governorate. Then 3 governmental schools were chosen from Shebin-el-kom district list of preparatory schools. Inside each school, a class from each educational grade from 1st to 3rd grade was randomly chosen to represent this grade. The total number of students in the 9 classes was 403.

Permissions were obtained from the administrators of the three selected schools after thorough explanation of the study. Participation in the study was optional and consent forms with information sheets clarifying aims of study were handed out to the students a week before the start of the study to be signed by their parents. The total number of students approved to participate in the study was 374 with a response rate of 92.8%. 45 students were absent from school or had missed data and were omitted from the study. The final number of students that were included in the study was 329 students.

2.3. Anthropometric Measurement

The researchers personally measured height and weight for the selected students by means of an electronic scale at each school after instructing the students to take off heavy clothes and shoes. Weight was measured to the nearest 0.5 kg. Height was measured to the nearest 0.1 m without shoes.

BMI (body mass index) was then calculated for the students by dividing weight in kg by the square height in meters [8]. After BMI was calculated for students, the BMI percentiles for each gender and age were calculated using CDC online calculators [9]. Weight status categories for students were thereafter calculated according to the following categories [8]:

- Underweight: < 5th percentile
- Normal weight: from 5th to < 85th percentile
- Overweight: from 85 to < 95 percentile
- Obese: \geq 95 percentile

2.4. Questionnaire

A self-administered questionnaire assessing behaviors of the children and their physical and emotional symptoms was used. Students were asked to fill the questionnaire at school. Our questionnaire was derived from Health behavior school children (HBSC) questionnaire. That questionnaire was developed by the international research network and adopted by WHO [10] to be used in children aged 11, 13 and 15 years. That survey contains 78 mandatory questions and sub questions and is carried out every four years in a growing number of countries; 44 countries across Europe and America [11]. We conducted our survey on students in the preparatory schools where their ages ranged from 13 to 16 years. We translated the questionnaire in Arabic and simplified it to shorten the interview time. Our questionnaire included only 31 items. Questions asking about sexual behavior, tobacco smoking and alcoholism were omitted because these questions are not accepted in our oriental societies in this age category

and may prevent participation in the study. Our questionnaire included 4 major sections which are:

- Selected demographic questions (age, sex, residence, father's and mother's occupation)
- Behavioral questions: dietary and entertainment behaviors
- Subjective health: headache, backache, abdominal pain, tiredness, sleep difficulty, depression and stress.
- Satisfaction about life and school environment: happiness in life, feeling lonely, feeling useless, feeling self-confidence, feelings about school, relation with classmates and teachers.

2.5. Statistical Analysis

Statistical analyses were carried out using Statistical package for Social Sciences Version 20. Normality of distribution was assessed for continuous variables. Medians and ranges were computed for numerical data while frequencies and percentages were computed for categorical data. Spearman correlation was used to test correlation between pocket money given to students and their BMI. Statistical significance was set at $p \leq 0.05$ (two-tailed).

3. Results

Table 1 shows demographics of the students where numbers of students in 1st, 2nd and 3rd grades were about 39%, 31% and 30% respectively. Male and female proportions were 46.5% and 53.5% respectively. The majority of students had professional working fathers in about 50.5% and had non-employed mothers in about 57%. Pocket money median was about 3 Egyptian pounds with a range from 0 to 15. {not tabulated}

Table 1. Demographic characteristics of the students

Demographics	No (329)	percentage
Grade:		
1st	129	39.2
2nd	101	30.7
3rd	99	30.1
Gender:		
Male	153	46.5
Female	176	53.5
Father occupation:		
Employee	110	33.4
Professional worker	166	50.5
Mother employment:		
Employed	142	43.2
Not employed	187	56.8

Table 2 shows the consumption rate for some selected foods among students. Only 30.4% of the students consumed fruits on a daily basis. The most common rate for raw and cooked vegetables consumption was once weekly in 26.7% and 43.5% respectively. Milk consumption rate was characterized by being rare in most of the students (39.2%). Less healthy food choices were common among the students. Students' consumption rate

for sweets and chips was the same; 46% more than once daily. The proportions of students who consumed hamburger, soft drinks and tea more than once daily were 3.6%, 25.8% and 22.2% respectively.

Table 2. Dietary behaviors of the students

Dietary behaviors	Scale				
	Never No (%)	Rarely No (%)	Once/week No (%)	Once/day No (%)	>once/day No (%)
Fruits /day:	0	43 (13.1)	92 (28)	100 (30.4)	94 (28.5)
Raw vegetables:	27 (8.3)	81 (24.6)	88 (26.7)	83 (25.2)	50 (15.2)
Cocked vegetables:	18 (5.5)	74 (22.5)	143 (43.5)	88 (26.7)	6 (1.8)
Milk	58 (17.6)	129 (39.2)	28 (8.5)	79 (24)	35 (10.7)
Sweets	14 (4.3)	33 (10)	32 (9.7)	100 (30.4)	150 (45.6)
Chips and crackers	12 (3.6)	25 (7.7)	31 (9.4)	111 (33.7)	150 (45.6)
Hamburger and sausage	69 (21)	140 (42.6)	66 (20)	42 (12.8)	12 (3.6)
Soft drinks	10 (3)	53 (16.1)	67 (20.4)	114 (34.7)	85 (25.8)
Tea	81 (24.6)	71 (21.6)	29 (8.8)	75 (22.8)	73 (22.2)

Table 3 shows that about 43% of students practiced physical activity less than 3 times per week. The majority of students (68.4%) watched TV at least 3 hours daily and about 53.5% of the students played computer games at least one hour daily.

Table 3. Entertainment behaviors of the students:

Entertainment behaviors	No (329)	percentage
Sports:		
<3times/week	141	42.9
≥ 3times/week	188	57.1
TV watching:		
<3hrs	104	31.6
≥3hrs	225	68.4
Computer game playing:		
<1hr	153	46.5
≥1hr	176	53.5

Figure 1 shows most of students are used to take their breakfast at school (48.3%), while 40.8% of the students take their breakfast at home and 10.9% of the students don't take breakfast at all.

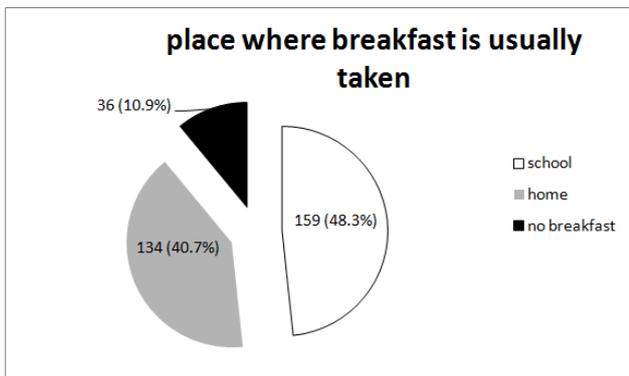


Figure 1. Place where students usually take breakfast

Figure 2 shows that the majority of students had normal weight (76.6%). The commonest weight abnormality was overweight in 18.8% of students followed by obesity in 10% and finally underweight in 3.6% of students only. There was no significant correlation between pocket money and BMI of the students; r of spearman = 0.02, p = 0.757 {not tabulated}.

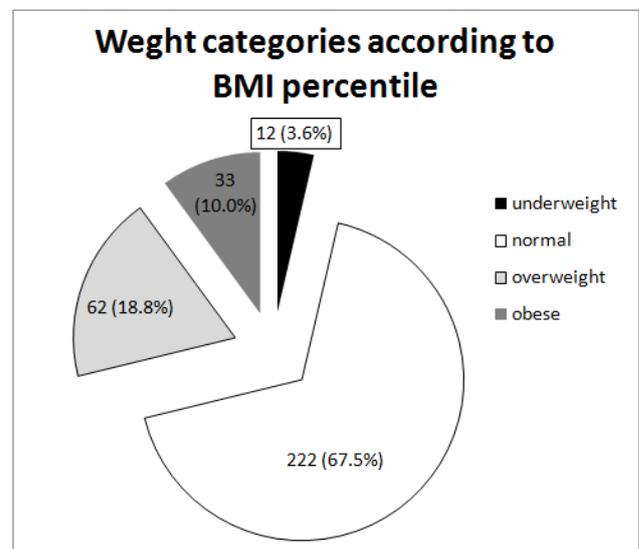


Figure 2. weight categories of the students according to their BMI percentiles

Table 4 shows various health complaints as reported by students. The commonest daily complaint was feeling stressed in 42.9% of students. Daily depression and sleep difficulty had the same rate which is 15.2%. About 16% of students complained of daily backache. In addition, students reported daily tiredness, headache and abdominal pain in 13%, 10% and 7% respectively.

Table 4. subjective health of the students

Symptoms	Scale		
	Never or rarely Number (%)	More than Once/ week Number (%)	everyday Number (%)
Headache	225 (68.4)	71 (21.6)	33 (10)
Backache	170 (51.7)	106 (32.2)	53 (16.1)
Abdominal pain:	242 (73.5)	64 (19.5)	23 (7)
Depression	235 (71.4)	44 (13.4)	50 (15.2)
Stress	113 (34.3)	75 (22.8)	141 (42.9)
Sleep difficulty	226 (68.7)	53 (16.1)	50 (15.2)
Tiredness	205 (62.3)	81 (24.6)	43 (13.1)

Table 5 shows satisfaction feelings of the students about life in general and about school environment. Nearly, 23% of the students reported they never feel

happy and 19.8% of them never feel self-confident. In addition, a major proportion of them agree or agree to some extent that they feel alone or useless; 53.8% and 68.4% respectively. The proportion of students reporting

they never like their school was 18.5%. Moreover, 22.5% of students feel that their teachers never like them or treat them like persons. and 9.1% of students feel their classmates never like them.

Table 5. Satisfaction of the students about life and school environment

Symptoms	Scale		
	Agree Number (%)	Agree to some extent Number (%)	Never Number (%)
Feeling happy in life	85 (25.8)	168 (51.1)	76 (23.1)
Feeling alone:	50 (15.2)	127 (38.6)	152 (46.2)
Feeling useless	126 (38.3)	99 (30.1)	104 (31.6)
Self confidence	139 (42.2)	125 (38)	65 (19.8)
Love school	125 (38)	143 (43.5)	61(18.5)
Feeling teachers like you and treat you as a person:	142 (43.2)	113 (34.3)	74(22.5)
Felling your classmates like you	224 (68.1)	75 (22.8)	30(9.1)

4. Discussion

Health behaviors in adulthood are the product of development during childhood. Regretfully, recent reports have suggested that young people are making unhealthy choices and their diets are low in fruits, vegetables and milk products or high in less healthy choices such as soft drinks and high-fat, high-sugar foods [12].

Another major concern is that a great proportion of students (36%) don't regularly have breakfast on school days which can negatively affect their academic performance and psychosocial functioning [13]. Research has indicated that adolescents who skip breakfast are more likely to consume large quantities of soft drinks, white bread and sweets and less quantities of fruits and vegetables than those who regularly take breakfast [14].

In our study, most of the students are used to take their breakfast at school (48.3%), while 10.9% of the students don't take breakfast at all (Figure 1). The problem is not only in the 10.9% of students who don't have breakfast at all but the 48.3% portion constitute a major part of the problem because they take their breakfast at school canteens where unhealthy food choices are the only available ones. We visited the canteens in the 3 schools of the study. Unfortunately, we found all of them pay attention to profit only and not to students' health; they sell attractive non healthy food to students like chips, beverages and sweets. Workers at these canteens don't have nutrition information and some of them do not even carry a license card. Some of the students told us they buy Shawerma and hamburger while at school. They call the sellers located outside schools and get their delivery.

Students in our study reported taking a daily pocket money from their parents with a median of 3 pounds and range from 0 to 15 pounds. However, there was no correlation between pocket money and BMI of the students in our study ($r = 0.02$, $p = 0.757$). Some authors have accused provision of generous pocket money to children to the occurrence of obesity among them because children mostly spend that money on buying less healthy food choices such as high-energy, fatty and sugary foods. Therefore, they suggested that parents and teachers motivate children on healthy spending of their pocket money [15].

In our study (Table 2) there was low consumption rate of beneficial foods compared to the less healthy food

choices. More than two-thirds of the students (69.6%) didn't consume fruits on a daily basis. Raw and cooked vegetables consumption was once weekly in 26.7% and 43.5% respectively. Most of the students (39.2%) described their milk consumption by being rare. On the other hand, less healthy dietary habits were common among the students. Students' consumption rate for sweets and chips was the same; 46% more than once daily. The proportions of students who consumed hamburger, soft drinks and tea more than once daily were 3.6%, 25.8% and 22.2% respectively.

Agreeing with our results is a Saudi study declaring high consumption of unhealthy food and low consumption of healthy choices. In that study, students consumed the following nutrients at least 3days per week: sugar-sweetened drinks (in two-thirds of the students), fast foods (in 27.5%), chips (in 28.5%) and candy (in 45%). On the other hand, students in that study reported low daily consumption of vegetables, fruits and milk; 22.5%, 12.8%, 58% respectively [16]. Another study conducted in Iran, showed that only one third of adolescents consume an optimal amount of fruit and vegetables [17].

The problem of adolescent low consumption of beneficial foods and high consumption of unhealthy food exists also in developed nations. Similar findings come from the health behavior survey which was conducted in 33 European and North American countries among 13 and 15-year-old students in the period from 2001to 2002, which showed that more than 50% of the students don't consume vegetables and fruits on a daily basis [18].

World Health Organization (WHO) has set recommendations for children aged 5-17 years to practice moderate to vigorous physically activity at least 60 min per day [19]. However, these recommendations were achieved by only 27.5% of the youth in a study on German adolescents [20].

In our study, there was low reporting of physical activity and high reporting of sedentary behaviors by students (Table 3). Less than half of the students (about 43%) practiced physical activity less than 3 times per week (less than the recommended by WHO). On the other hand, sedentary behaviors were much commoner and for prolonged periods. The majority of students (68.4%) watched TV at least 3 hours daily and about 53.5% of the students reported playing computer games at least one hour daily.

Consistent with our results is a study in Arab world which declared that about 87% of Saudi adolescents spent

more than 2 hours on screen time daily and nearly 63% of them did not meet the daily physical activity guidelines [16].

Another USA study about adolescent behaviors in the period from 1999–2009 showed that the youth increased their average amount of time spent viewing TV from 3 hours 45 minutes to 4 hours 30 minutes per day. Moreover, the daily computer use also increased in the same period from 27 minutes to 1 hour 29 minutes [21].

Reports suggest that children who spend too much time at the computer or watch more than ten hours of TV per week are missing out on important activities like playing with friends, reading or going outside. These children are at increased risk for social isolation, bad academic performance, aggressive behavior and may be irresponsible sexual behavior [22].

Because of all these risks linked to prolonged screen time, some organizations recommend limiting leisure screen time; the time spent in front of computers or televisions to 2 hours or less daily for children above 2 years of age [23]. However, most kids ignore these recommendations and their screen time exceeds the recommended limits [24,25].

In our study, 18.8% and 10% of the students were overweight and obese respectively while 3.6 % of the students were underweight (Figure 2). These prevalence values are higher than values described in a comparative Mexican Egyptian study which reported Overall prevalence of overweight and obesity in adolescents was 12.1 and 6.2%, respectively, among the Egyptian adolescents [26]. However our prevalence values for overweight and obesity agree with a more recent study which declared 17.7% and 8% of the adolescent students had overweight and obesity respectively [27].

Being in good physical and emotional health helps youth to deal with the stresses of adolescence and facilitates their transition into adulthood [28]. Adolescents commonly have subjective health complaints, such as, headache, abdominal pain etc. however, most of these complaints have no obvious organic cause and originate as a reaction to psychosocial tensions [29]. The importance of emotional health problems in the adolescence period comes from the fact that they are predictors of some risk behaviors such as smoking, drinking alcohol, eating disorders and violence [30].

In the current study, adolescents had many subjective health complaints (Table 4). The majority of students complained of daily feeling of stress (42.9% of the students). About 15 % of students reported feeling depression and complained of sleep difficulty every day. Moreover 16% complained of daily backache. Less common daily complaints among the students were feeling of tiredness, headache and abdominal pain in 13%, 10% and 7% respectively.

Many surveys were concerned about physical health of the adolescents. One of them is a new survey for the American Psychological Association done on U.S. teenagers. The main findings from that survey indicate that a large proportion of youth (27%) felt extreme stress during the school year but that number dropped to 13% during summer. In that survey, 32 % reported headaches, 21% reported abdominal pain and 23% had skipped a meal due to stress [31]. Another study declared that depression is a common disorder in the adolescent

population; 11 % reported symptoms of depression at any time and about 30% of depressed teens reported some kind of suicidal thoughts, with 10% reporting an actual suicide attempt [32].

Only 16% of the adolescents in the current study reported daily backache. Low back pain (LBP) in children has commonly been reported as high as 30%-65% in some studies [33]. Multivariate analysis declared that the use of heavy backpacks is an independent factor for backache in children [34]. An ergonomic study on musculoskeletal pain in children has specified the weight of school bag to a safe load limit not exceeding 10% to 15% of body weight of school going children [35].

Life satisfaction is an important component of perceived health; it improves the social competence and prevents psychological abnormalities during childhood and adolescence [36]. Table 5 shows aspects of life satisfaction among students where 23% of them reported they never feel happy and 19.8% say they never feel self-confident. In addition, students agreed or agreed to some extent on that they feel alone and useless in 53.8% and 68.4% respectively.

A Study in Scotland assessing life satisfaction of adolescents declared that 49% reported they were very happy, 36% never felt helpless, and 20% always feel confident. That study shows also that feelings of happiness, confidence and helplessness among young people have improved in the period between 1994 and 2006 [12]. This great difference in life satisfaction can be attributed to difference in socioeconomic status and the living conditions between people in poor countries and their counterparts in rich countries [37].

There is an inter-countries wide variation; from 5% to 40% in the percentage of students reporting they like their school a lot. Furthermore, the proportion of students who feel their classmates like them ranges from 30% to 90% [38]. In fact, the positive feelings of students towards school environment has a major impact on social aspect of the students; social adjustment, development of social skills, positive self-esteem and psychological development [39]. Moreover, this positive feelings play significant role in preventing risky behaviors such as smoking, alcohol, illegal drugs and violent and harmful sexual behaviors [12].

Unfortunately, negative feelings about school were common in the current study (Table 5) where 18.5% of the students reported they don't like their school at all. Additionally, 22.5% of students stated that their teachers never like them or treat them like persons and 9.1% of students mentioned their classmates don't like them.

Over peck stated that students satisfaction about their school setting can be improved if students are given opportunities to share in setting school rules and if they find support from teachers or other students whenever they need [38].

5. Limitations

The limitations of this study is that HBSC questionnaire was not implemented in full. Questions about sexual behavior, tobacco smoking and alcoholism were omitted because these questions are not accepted in our oriental societies in this age category and may prevent participation in the study. Health education for the society

through mass media about accepting these questions should precede any surveys for this purpose.

6. Conclusion and Recommendation

The current study showed that the majority of students practice bad dietary habits and most of them experience prolonged screen times. Moreover, poor subjective health and low satisfaction about life and about school environment were commonly described by the students. We recommend implementing a national survey about general health and behaviors of Egyptian adolescents every few years to obtain national data and to compare trends over years. We also recommend implementing health promotion programs for adolescents about healthy dietary behaviors, physical exercise and improving school connectedness.

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