

*Full Length Research Paper*

# Exploring Fayoum (Upper Egypt) preparatory school students' and teachers' attitude towards obesity as health risk

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**Childhood obesity is a serious non-communicable public health problem with negative physical, social, and mental health consequences. Factors contributing to childhood obesity are school nutrition, excessive snacks, fast food, lack of physical activity and family behavior. The objective of this study is to explore Fayoum preparatory of school students' and teacher's attitude concerning obesity and healthy nutritional behavior and investigating readiness of teachers to attain an active role in student's nutritional education. This was a cross sectional descriptive study implemented in three preparatory schools of Fayoum district. Multistage stratified sample of 990 students, attending first, second and third grades. In each school, two classes were randomly selected from each grade, students interviewed for filling a structured questionnaire and anthropometric measurements were taken. Teaching staff at the schools (48) shared in four focus group discussions. More girls were reported in the overweight and obese category. Almost half of the students knew the proper food for their age. 62.1% of them consumed meals in front of the TV and 44.9% ate fast foods. The majority of both students and teachers agreed that physical activity and diet controls were the main control measures of obesity. 70.8% of teachers agreed that they should have an active role in obesity prevention. It was clear that Fayoum students had some nutritional knowledge but there was a defect in practice. Effective communication and collaboration among school and home offers the possibility of improving the quality of life and reducing the health care costs.**

**Key words:** Childhood obesity, nutritional behavioral, teachers role.

## INTRODUCTION

Prevalence of childhood obesity is rising around the world. The World Health Organization (WHO) has addressed obesity as a global epidemic. There are 155 million (1 in 10) children classified as overweight, and around 30-45 million as obese, worldwide (Gabriela et al., 2007). According to WHO, non-communicable diseases will account for approximately three quarters of all deaths in developing world by the year 2020. The increase in obesity may be particularly rapid in developing countries (Roya, 2007). The importance of obesity and overweight among children has been highlighted as obesity incidence

among adolescents (10 to 18 years) in Egypt is rising rapidly, being reported that overweight represent 11.5% in boys and 15.2% in girls, while obese adolescents are 6.5% in boys and 7.7% in girls (Shaheen et al., 2004).

Prevalence of obesity not only increases with age, but there is greater likelihood that obesity beginning at early childhood will persist throughout the life span. Dramatic increase in prevalence of childhood overweight/obesity and its resultant co-morbidities such as, heart disease, hypertension, type II diabetes mellitus and early atherosclerosis warrants strong and comprehensive efforts at the preventive level (Horodyski and Stommel, 2005).

There are different factors contributing to childhood obesity, such as, schools nutrition, excessive snacks, fast food, lack of physical activity, family behavior, economic

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and social, and media technologies such as television, internet/computer, and wide spread of video games technology, which negatively affect childhood obesity (Mattsson and Helmersson, 2007).

Bridget (2008) reported that school teachers play an important role in combating childhood obesity and implementing preventative strategies as children tend to get habits about how they eat when they are young. Combating childhood obesity is considered as a global health priority. Early prevention with appropriate interventions is particularly valuable for children at risk. It is here that the potential role of the educational institutions stands undisputed. Schools are probably the ideal medium to acquire knowledge and skills combined with an environment that makes healthy choices possible throughout their lives.

This study aims at exploring Fayoum preparatory school students', and teacher's attitude concerning obesity and healthy nutritional behavior. A secondary purpose is to investigate the readiness of teachers to attain an active role in student's nutritional education.

## MATERIALS AND METHODS

This study is conducted in Fayoum Governorate, which is located in Upper Egypt and is divided into 6 districts (that is, Fayoum, Etsa, Tamiya, sinnuris, Youssef sadiak, Abshoay). The study population of this research consisted of two categories of subjects: Preparatory school students, and their teachers.

1. Student subjects were chosen using a multistage stratified sample of 990 children (544 boys and 446 girls) aged 12 to 15 years attending first, second and third grade of three preparatory public schools from the Fayoum Educational District (one out of the six educational district). In each school, two classes were randomly selected from each grade, where all students were enrolled after official and parental approval was granted. They were interviewed for filling a structured questionnaire. Anthropometric measurements (weight and height) were also undertaken, and the Body mass index is calculated. BMI defined as the individual's body weight divided by the square of his or her height in meters. CDC BMI age- and sex-specific percentiles charts are used to allow translation of a BMI number into a percentile for a child's sex and age weight status. The steps implemented are: 1) Obtain height and weight measurements, 2) Calculation of the BMI. 3) The weight status percentile is found by plotting the calculated BMI against the child's age. The weight category was identified according to the Weight Status Category-Percentile Range: Underweight is less than the 5th percentile, healthy weight is the percentile to less than the 85th percentile, overweight is 85th to less than the 95th percentile and obese is equal to or greater than the 95th percentile.

2. Teaching staff of different subjects at the three preparatory schools (48) were invited to share in four focus group discussions (12 teachers each).

## Ethical consideration

This study was reviewed and approved by the Faculty of Medicine Research Ethical Committee, and a waiver of consent form was approved. We used an anonymous questionnaire with no private or sensitive information. Anthropometric measurements were conducted in a private room in the school. All collected data by the

self-reported questionnaires were kept confidential. All participants had the right not to participate in the study.

## Data analysis

Data was collected, coded, and analyzed using SPSS software version 15 under windows 7, simple descriptive analysis in the form of means and standard deviations were calculated for numerical data. Qualitative data were described using percent distribution and chi square test. Inferential statistic test was used to detect differences between categories, with a significant level of less than 0.05.

## RESULTS

The studied preparatory school students comprised of 990 students. They were almost equally distributed ( $P=0.093$ ) among the three grades (33.9, 34.8, and 31.3% at 1st, 2nd and 3rd grades). Boys represented 54.4% ( $N=544$ ) of the sample, while girls constituted 45.6% ( $N=446$ ). Their age ranged from 12 to 15 years with a mean age ( $\pm$  SD) of  $13.66 \pm 1.02$  years. Investigating gender difference in weight status, the results show that more females were reported in the overweight and obese category ( $P=0.000$ ) (Table 1).

## Awareness of students about their own body image

The results shown in Table 2 revealed that there was a statistically significant difference ( $P=0.000$ ) between knowing weight and height, and the actual anthropometric measurements.

## Student's awareness about the major food categories was investigated to show that only

45.9 ( $N=454$ ), 25.6 ( $N=253$ ) and 31.8% ( $N=315$ ) could identify food categories for growth, activity and for disease prevention respectively. Students in the different weight levels did not differ in their knowledge about foods for growth and activity ( $P=0.15$  and 0.68 respectively), they only differed statistically in the disease prevention food group ( $P=0.001$ ), where overweight and obese students recorded the highest 39.2% ( $N=133$ ) correct answers (Table 3). The main source of nutrition information was their parents 60.3% ( $N=597$ ), 28.9% ( $N=286$ ) from their teachers and 7.4% ( $N=73$ ) from TV.

Dietary Habits, family obesity, computer time and exercise habits are presented by weight category in Table 4. Significant differences between groups ( $p < .05$ ) were discovered for eating fast food, family obesity, and spending more than 3 hours a day at the computer. Students perceived obesity as a preventable disease.

They highlighted lack of physical activity 84.3% ( $N=835$ ) and eating too much food 83.6% ( $N=828$ ) as the most possible causes. Psychological factors 55.4%

**Table 1.** Student's categories according to weight.

| Weight category   | Total (N=990) |      | Boys (N=544) |      | Girls (N=446) |      | P value       |
|---|---------------|------|--------------|------|---------------|------|---------------|
|   | N             | %    | N            | %    | N             | %    |               |
| Less than normal (<5 <sup>th</sup> %)                         | 26            | 2.6  | 22           | 4.0  | 4             | 0.9  | <b>0.000*</b> |
| Normal (5 <sup>th</sup> - 85 <sup>th</sup> %)                 | 625           | 63.1 | 356          | 65.5 | 269           | 60.1 |               |
| Overweight and Obese (85 <sup>th</sup> -> 95 <sup>th</sup> %) | 339           | 34.2 | 165          | 30.5 | 174           | 39.0 |               |

**Table 2.** Student's awareness about body image (weight and height).

| Students group                                    | Student answer |      | Correct status as detected by measurement |      | P              |
|---|----------------|------|---|------|----------------|
|   | N              | %    | N   | %    |                |
| Know weight                                       | 248            | 25.0 | 139                                       | 14   | <b>0.000*</b>  |
| Know height                                       | 178            | 18.0 | 69  | 7.0  | <b>0.000*</b>  |
| <b>Actual weight category</b>                     |                |      |   |      |                |
| Less than normal (<5 <sup>th</sup> %)             | 136            | 13.7 | 26  | 2.6  | <b>0.000 *</b> |
| Normal (5 <sup>th</sup> - 85 <sup>th</sup> %)     | 673            | 68.0 | 625                                       | 63.1 |                |
| Overweight (85 <sup>th</sup> -95 <sup>th</sup> %) | 161            | 16.3 | 225                                       | 22.7 |                |
| Obese (>95 <sup>th</sup> )                        | 20             | 2.0  | 114                                       | 11.6 |                |

**Table 3.** Distribution of right answers of sources of three food groups according to weight status.

| Right answers for source of food | Growth (N=454) |      | Activity (N=253) |      | Disease prevention (N=315) |      |
|----------------------------------|----------------|------|------------------|------|----------------------------|------|
|                                  | N              | %    | N                | %    | N                          | %    |
| < under weight, N=26             | 9              | 34.6 | 5                | 19.2 | 8                          | 30.8 |
| Normal weight, N=625             | 277            | 44.3 | 158              | 25.3 | 174                        | 28.0 |
| Overweight and obese, N=339      | 168            | 49.6 | 90               | 26.5 | 133                        | 39.2 |
| P value                          | 0.150          |      | 0.688            |      | <b>0.001*</b>              |      |

**Table 4.** Dietary habits.

| Dietary habits and lifestyle     | Total (%) | Less than normal N=26 |      | Normal weight N=625 |      | Overweight and obese N=339 |      | P-value       |
|----------------------------------|-----------|-----------------------|------|---------------------|------|----------------------------|------|---------------|
|                                  |           | N                     | %    | N                   | %    | N                          | %    |               |
|                                  |           | Eat In front of TV    | 62.1 | 12                  | 46.2 | 388                        | 62.1 |               |
| Eat Fast food                    | 44.9      | 14                    | 53.8 | 301                 | 48.2 | 130                        | 38.3 | <b>0.009*</b> |
| Snacks                           | 41.9      | 8                     | 30.8 | 259                 | 41.4 | 148                        | 43.7 | 0.405         |
| Skip breakfast                   | 37.4      | 10                    | 38.8 | 229                 | 36.7 | 131                        | 38.6 | 0.823         |
| Eat quickly                      | 28.2      | 8                     | 32.0 | 178                 | 28.4 | 93                         | 27.4 | 0.902         |
| more than 3meal                  | 25.3      | 9                     | 34.6 | 158                 | 25.8 | 83                         | 24.5 | 0.518         |
| Family obesity                   | 40.7      | 4                     | 15.4 | 248                 | 39.7 | 151                        | 44.5 | <b>0.010*</b> |
| Computer time more than 3 h /day | 42.4      | 7                     | 28.0 | 261                 | 41.8 | 152                        | 44.8 | <b>0.011*</b> |
| Exercise (30 min /day)           | 64        | 18                    | 69.2 | 408                 | 65.3 | 208                        | 61.4 | 0.410         |

(N=549), hormonal factors 45.4% (N=448) and lastly hereditary factors 43.1% (N=435) were also mentioned. Investigating student perception of obesity as a problem, the research identified two areas: how does obesity

impede the lifestyle and its health consequences. Negative attitudes towards obesity consequences considering it to hinder excelling in sports, 67.1% (N=664), affecting beauty, 64.8% (N=642), decreasing activity

**Table 5.** Knowledge and practice of school teachers.

| Topics   | Confident teachers |       |
|--|--------------------|-------|
|  | N                  | %     |
| Food groups                                    | 44                 | 91.7  |
| Food sources                                   | 42                 | 87.5  |
| Types of fat                                   | 24                 | 50.0  |
| Hazards of fat consumption                     | 34                 | 70.8  |
| Types of carbohydrates                         | 29                 | 60.4  |
| Suitable amount of each nutrient               | 14                 | 29.2  |
| Ability to advice student with obesity problem | 14                 | 29.2  |
| Lifestyle changes needed to prevent obesity    | 48                 | 100.0 |
| Type and duration of physical activity         | 30                 | 62.5  |

participation, 61.1% (N=605), lowering self confidence 48.7% (N=482), interfere with acquiring friends 34.3% (N=340) and excelling in school, 25.2% (N=249). The majority of the sample, 75.2% (N=742) agreed that obesity leads to morbidities and might even lead to death 54.1% (N=536). More than two thirds of the sample pointed to obesity as a risk factor in bone and joint diseases 71.1% (N=703) as well as heart diseases 68% (N=676). They also believed that obesity was a risk factor in psychological problems, 62.4% (N=618) and respiratory problems, 60% (N=594). Around one third of the study subjects also refer to obesity as a risk factor in dental problems, 30% (N=297) and cancers, 29.5% (N=292).

### Obesity control measures

The majority of the studied sample of both students and teachers considered physical activity (more than 90%) and diet control (more than 80%) to be the main control measures of obesity. Medical treatment and surgical interventions are less popular measures for obesity management with no statistical significant difference (Figure 1).

Using the logistic regression (step wise) analysis shows that knowing the actual weight, number of study hours and knowing food sources for disease prevention were the only predictors for being in the normal weight category. The percent of cases for which those dependent variables correctly predicted the model was 66.8%. The strongest predictor of the weight status was knowing the actual weight correctly which predicted alone 62.3% with a *P*- value of 0.009 and an odds ratio of 2.204.

Focus group discussions with the school teachers: included several domains such as magnitude of obesity problem, their willingness and readiness to share in obesity prevention. All teachers agreed that obesity is a global and national problem; they share the fear that it is affecting younger generations especially with the wide

spread use of computer and video games among them. 70.8% (N=34) of teachers agreed that they should have an active role in obesity prevention, but only 48.8% (N=22) thought that they were well equipped to do so. All teachers blamed the school environment to play a major role in encouraging unhealthy student behavior; where the school canteen offering candies, cookies and processed foods, in addition to the lack of school control on vendors outside the school premises. 80% (N=38) mentioned that time allocated for physical education is often taken over by mathematics and Arabic teachers to fulfill the curriculum requirements. 75% (N=36) of teachers stated that they would like to join school activities or programs that adopted obesity prevention, with tremendous arrangements be done to enable such activities. They all agreed that engaging the parents at home is necessary to make this possible, as all households should adopt nutrition behavioral change. Discussing the essential topics needed to establish a school health program, all teachers agreed to the importance of defining the elementary food groups and its sources as well as healthy life style. The investigators tried to explore the teacher's confidence in discussing dietary topics with the students, the answers summarized in Table 5.

### DISCUSSION

Obesity levels in children have been gradually rising. Our results revealed that 34.2% of the total sample was overweight and obese which was significantly detected among girls 39% than boys 30.5%. This is higher than the national level, as overweight and obesity was recorded to be 18% in boys and 22.9% in girls (Shaheen et al., 2004). The higher rates of obesity could be explained by culture constrains and rural nature of Fayoum Governorate. This explanation are approved by the results of Chrystalleni and Elpidoforos (2010) and Fahmy et al. (2006) which documented that adolescent boys are performing physical exercise, while girls spent

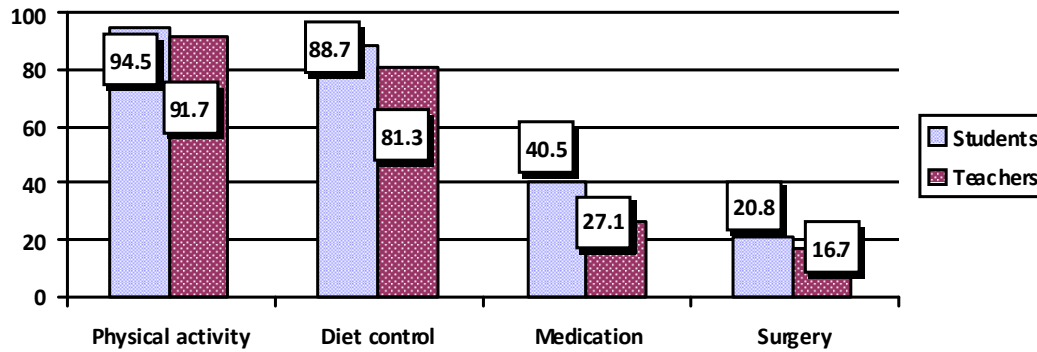


Figure 1. Measures of obesity control.

more time in studying homework.

Although, our results revealed high rates of overweight and obesity among students, this fact was not obvious to the students themselves. Only 18.3% considered themselves overweight and obese while the actual weight status according to CDC BMI charts for age 2000, was 34.2%. AlShendi et al. (2004) was in agreement with the results, as they reported a significant discrepancy between adolescents' perception of body weight status and actual BMI, with adolescents' tendency to underestimate their weight status, especially among overweight and obese. Our results highlight the importance of creating the behavior of being regularly weighed as it is the strongest predictor of being in the normal weight category and thus it crucial for obesity prevention.

The main source of nutrition information was the parents of the students, followed by their teachers and lastly TV. This was approximately as the results of Abdollahi et al. (2008) and Patrice et al. (2009) which concluded that children obtained their knowledge from their parents and TV programmes, such as, children's programmes, family programmes, advertisements, and educational programmes. Other sources of knowledge were books, teachers, friends, newspapers, etc.

Poor dietary habits that have been shown in the study sample put the student at a risk of obesity. Only, 64% of the students reported exercising, this is due to cutbacks and lack of importance given to school physical education, in the majority of Egyptian schools which do not meet the recommended standard of weekly physical education. Corrective action should be planned to prevent the increased risk of obesity.

It is a favorable finding that the majority of the students agreed that obesity leads to morbidities and might even lead to death; teachers as well shared the same opinion. They also considered physical activity and diet control as the main control measures of obesity. Medical treatment and surgical intervention were more preferable by students than teachers. It is a critical point that measures taken to prevent obesity in children reduce the risk of

developing potentially fatal health conditions that can develop as children mature into adults (Shipra and Graham, 2005).

Schools have been recognized as an appropriate setting for the prevention of childhood obesity due to continual and concentrated access to a large number of individuals at a developmentally appropriate age. School based programs offer the opportunity for curriculum support and reinforcement using a whole school approach to health promotion. Social learning theories recognize the significant opportunity of teachers to influence student behavior by role modeling, normative practice and social support. They can play a vital role in establishing a correct environment for children and youth to learn the required skills, knowledge and habits to develop active healthy lifestyles. At present, schools do not make the most of its potential opportunities for the prevention of childhood obesity. School teachers receive little or no training in nutrition or preventive techniques, and they consistently report a lack of knowledge as a barrier to implementing prevention programs (Yager and O'DEA, 2005).

## CONCLUSION AND RECOMMENDATION

It was clear that Fayoum students had some nutritional knowledge but there was a defect in practice. Children need to learn more about nutrition and the effect of different foods on health. The nutrition content of the school syllabus should be appropriate for each level. Nutrition education programmes should not only include children but their parents as well, this can enhance the initiation of behavioural change.

Teachers must emphasize the importance of health and of integrating daily physical activity and healthy diet into their daily teaching routines. Collage and in service training for school personnel should address the personal and professional needs to qualify them to attain their role as health educators. Teachers and parents must work closely to gain the necessary skills, attitudes and to

develop, maintain healthy active life styles. Effective communication and collaboration among school and home offers the possibility of helping improve the quality of life while at the same time reducing the health care costs to society

## REFERENCES

- Abdollahi M, Amini M, Kianfar H, Dadkhah PM, Eslami AM, Zoghi T, Assasi N, Kalantari N (2008). Qualitative study on nutritional knowledge of primary school children and mothers in Tehran. *Eastern Mediterranean Health. J.* 14, 1.
- AlShendi AM, Shetty P, Musaiger AO (2004). Body weight perception among Bahraini adolescents. *Child Care. Health. Dev.*, 30 (4): 369-376.
- Bridget F (2008). The role of elementary school physical activity in combating childhood obesity. Providence College Social Work Student Papers
- Chrystalleni L, Elpidoforos SS (2010). Children's physical activity, TV watching and obesity in Cyprus: the CYKIDS study. *European J. Public Health*, 20(1): 70-77.
- Fahmy WA, Nebal AR, El hossein TS (2006). Physical Activity, Diet and Social Status as Risk Factors for Overweight and Obesity among Dakahlia Adolescent Kasr El-Aini Medical Journal, Published by Medical Education Development Center Cairo University.
- Gabriela V, Sue D, David RJ, Karri S (2007). Comparison of Body Mass Index, Waist Circumference, and Waist/Hip Ratio in Predicting Incident Diabetes: A Meta-Analysis 7.
- Horodynski MA, Stommel M (2005). Nutrition education aimed at toddlers: An intervention study. *Pediatric Nursing*, 31: 366-378.
- Mattsson J, Helmersson H (2007). Eating fast food: attitudes of high-school students. *Int. J. Cons. Stud.*, 31: 117-121.
- Patrice AT, Dale RT, Rosalie JA (2009). Nutrition Information Sources Used by Adolescents Family Con. *Sci. Res. J.* 16, 3.
- Roya K (2007). Childhood Overweight, Obesity, and the Metabolic Syndrome in Developing Countries. *Epidemiol. Rev.*, 29 (1): 62-76.
- Shaheen FM, Hathout M, Tawfik AA (2004). National survey of Obesity in Egypt. Final Report, Cairo. National Nutrition Institute Cited at: National Food & Nutritional Policy Strategy (2007-2017). Towards achievement of the Millenium Developments Goals (MDGs): National Nutrition Institute (2007): 82.
- Shipra S, Graham JF (2005). Health professionals and Teachers: Collaboration is the Key to reducing Childhood Obesity. *University of Alberta Health Sci. J.* 2: 2.
- Yager Z, O'DEA JA (2005). The Role of teachers and other educators in the prevention of eating disorders and childhood obesity: what are the issues? *Eating disorders* 13: 261-278.