Review Article

Dental Students' Perception, Knowledge and Beliefs Regarding Obesity

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Abstract

Background: Obesity and overweight are significant global health concerns, affecting both children and adults, with rising prevalence rates worldwide. In Tunisia, the situation mirrors global trends, with increasing obesity rates linked to urbanization and shifts toward high-calorie, low-nutrient diets. Dentists play a fundamental role in addressing this issue and the prevention of this problem. This study aimed to provide insights into the perspectives and understanding of dental students in their academic training.

Methods: This cross-sectional study, conducted from May 2022 to April 2023 at the Faculty of Dental Medicine in Monastir, Tunisia, investigated undergraduate dental students' education, opinions, beliefs and knowledge. A questionnaire, divided into four sections-general characteristics, education, opinions and knowledge-was randomly distributed. Data were analyzed using SPSS software. The chi-square test was applied to compare percentages at a significance level of 0.05.

Results: Most dental students reported moderate knowledge of obesity but recognized its high prevalence in Tunisia and supported dentists' involvement in prevention. BMI was the preferred identification tool and females spent more time studying obesity-related topics than males. Besides, the comparison between clinical and preclinical students was almost statistically significant.

Conclusion: This study represents an initial exploration of obesity and overweight within the Tunisian population, revealing a self-reported low level of obesity education among dental students, regardless of gender or clinical experience. It emphasizes the dentist's dual role in identifying obese patients and acting as a crucial link for prevention with other medical specialties.

Keywords: Children; Adults; Dentist; Knowledge; Opinion; Overweight; North Africa; Tunisia

Introduction

Obesity is a major health issue that affects millions of adults and children worldwide. It is defined as having a Body Mass Index (BMI) of 30 or higher. BMI is calculated by dividing a person's weight in kilograms by their height in meters squared. Its development is influenced by a multitude of factors, spanning genetics, individual lifestyle and the surrounding environment [1,2]. The World Obesity Federation estimates that by 2020, around 770 million adults globally were affected by obesity and according to the World Health Organization (WHO), the number of overweight and obese children under the age of five is estimated to be over 42 million worldwide. In Tunisia, recent statistics published by the Global Nutrition Report showed that

37.5% of adult (aged 18 years and over) women and 22.1% of adult men are living with obesity. The prevalence of overweight children under 5 years of age is 17.2% [2,3]. For dental professionals, treating obese patients seems to be a hard task. Dental treatment for obese patients requires considering numerous factors, including medical history and comorbidities, which are increasingly prevalent in children. Consequently, the challenge seems to be higher with children. Future dentists need comprehensive knowledge of these challenges, starting with their academic foundation, to provide effective care.

This study aimed to assess beliefs, knowledge and attitudes of dental students towards overweight and obesity among children and adults in Tunisia.

Materials and Methods

It was a cross-sectional study performed from May to April 2023. This study received ethical approval from the Ethics Committee of the Faculty of Dental Medicine, Monastir, Tunisia. All participants provided informed consent after receiving a clear explanation of the study protocol. The study included undergraduate dental students of the faculty of dental medicine of Monastir in Tunisia. Graduated dental residents are excluded. Foreign students were not included.

This study adapts questionnaires from Wyne, et al., and Magliocca KR, et al., studies [4,5]:

The questionnaire was presented in both English and French. It was divided into four main parts as follows:

- General characteristics such as age, gender and the current year of study/training.
- Education question
- Opinion and beliefs questions
- Knowledge questions

The questionnaires were distributed randomly to students. Once received, data were collected and then analyzed using SPSS software. The chi-square test was used to compare percentages. The level of significance was set at 0.05.

Results

A total of 268 individuals responded to the survey. The majority were female (70.5%), with males comprising 29.5%. First-year students represented the largest group (36.9%). Their distribution according to their study level is presented by Fig. 1. Table 1 summarizes the main findings of the present survey. The majority of dental students reported a poor knowledge of overweight/obesity in both adults and children (respectively 35.1% and 45.5%). Only 19.8% and 18.2% reported a good knowledge of overweight /obesity, respectively, for adults and children. The difference was a statistically significant difference (P=0). Statistically significant differences were reported in the number of hours devoted to the subject of obesity between males and females. Females reported more important devoted hours. The difference was statistically significant (P=0) with half of the participants believing that overweight/obesity in Tunisia is not a major issue among adults, while the other half believed it affected many adults. A quarter of the students believed that overweight/obesity was a concern for many children, while 64.2% believed it only affected a few. Most dental students agree that dentists should have a role in the identification/prevention of overweight/obesity in adults (78%) and children (86.2%). 56,5% of dental students believe that the best tool used to identify overweight and obesity is the Body Mass Index, while about 29% have chosen the weight-to-height ratio. 9% and 4% reported the weight measurement and visual assessment (P=0.00).
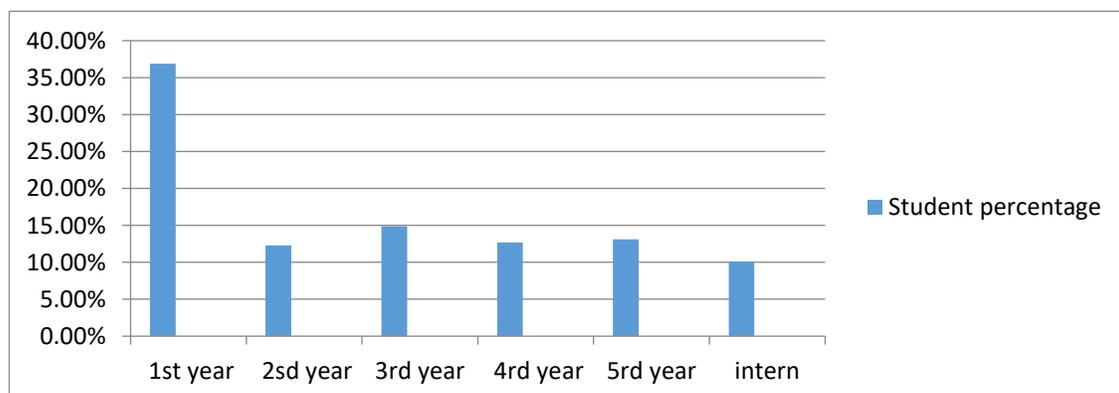
Figure 1: Distribution of participants according to the year of study.

Education question					
		0-1 h	2-5h	6-15h	P
	All participants	**51.1%**	**32.7%**	**12.7%**	**0.000**
1. Number of hours devoted to the subject of obesity	Males	49.3%	43.3%	5.3%	0.006
	Females	56.8%	27.3%	15.9%	
	Preclinical	55.8%%	32.1%	12.2%	0.8
	Clinical	52.6%	33.7%	13.7%	
Opinion and beliefs questions					
		Poor/Fair	Average	Good	P
2. How do you judge your knowledge of overweight /obesity in adults	All participants	**35.1%**	**45.1%**	**19.8%**	**0.000**
	Males	30.4%	50.6%	19%	0.4
	Females	37%	42.9%	20.1%	
	Preclinical	35.5%	45.3%	19.2%	0.9
	Clinical	34.4%	44.8%	20.8%	
3. How do you judge your knowledge of overweight /obesity in children	All participants	**45.5%**	**39.9%**	**18.2%**	**0.0000**
	Males	32.9%	51.9%	15.2%	0.019
	Females	50.8%	34.9%	14.3%	
	Preclinical	47.1%	39%	14%	0.7
	Clinical	42.7%	41.7%	15.6%	

		BMI	W/H	WM	VA	P
4. What is the best method to identify OW/OB in adults/children	All participants	56,5 %	29.1%	4.1%	9.7%	0.000
	Males	47%	27.8%	3.2%	14%	0.03
	Females	59%	29.1%	6.3%	6%	
	Preclinical	48.3%	34.9%	4.1%	12.2%	0.004
	Clinical	71.9%	18.8%	4.2%	5.2%	

BMI : Body Mass Index,W/H:Weight/ height ratio,WM: Weight Measurement, VA: Visual Assessment

		Problem in someones	Problem in many ones	No problem	P
5. What do you believe about overweight/obesity in adults in Tunisia?	All participants	**50.4%**	**45.1%**	**4.5%**	**0.000**
	Males	50.6%	41.8%	7.6%	0.20
	Females	50.3%	46.6%	3.2%	
	Preclinical	49.4%	45.3%	5.2%	0.7
	Clinical	52.1%	44.8%	3.1%	
6. What do you believe about overweight/obesity in children in Tunisia?	All participants	**64.2%**	**25%**	**10.8%**	**0.000**
	Males	55.7%	26.6%	17.7%	0.04
	Females	67.7%	24.3%	7.9%	
	Preclinical	63.4%	23.8%	12.8%	0.3
	Clinical	65.5%	27.1%	7.3%	

		yes	No	p
7. Should dentists have a role in the Identification/prevention of overweight/obesity in adults?	All participants	**78%**	**22%**	**0.000**
	Males	75.9%	24.1%	0.603
	Females	78.8%	21.2%	
	Preclinical	75.6%	24.4%	**0.00**
	Clinical	82.3%	17.7%	
8. Should dentists have a role in the identification/prevention	All participants	**86.2%**	**13.8%**	**0.000**
	Males	82.3%	17.7%	**0.230**

of overweight/obesity in children?	Females	87.8%	12.2%		
	Preclinical	82.6%	17.4%		**0.00**
	Clinical	92.7%	7.3%		

Knowledge questions					
		Agree	**Neutral**	**Disagree**	**P**
9. The student has taken other courses about obesity prior to dental school	**All participants**	36%	23.9%	40.7%	**0.004**
	Males	37.2%	20.5%	42.3%	0.6
	Females	35.4%	25.4%	39.2%	
	Preclinical	36.3.8%	22.2%	41.5%	0.6
	Clinical	35.4%	27.1%	37.5%	
10. Obesity is a chronic medical disease	**All participants**	59%	17.5%	23.6%	**0.000**
	Males	58.2%	22.8%	19%	0.2
	Females	59.3%	15.3%	25.4%	
	Preclinical	59.3%	19.2%	21.5%	0.4
	Clinical	58.3%	14.6%	27.1%	
11. Small weight losses (5-10 percent of body weight) can produce important medical benefits for obese patients.	**All participants**	84.4%	12.5%	10.3%	**0.000**
	Males	85.9%	12.8%	1.3%	0.5
	Females	84%	12.3%	3.7%	
	Preclinical	82.2%	13.6%	4.1%	0.2
	Clinical	88.5%	10.4%	1%	
12. Obesity is associated with serious medical conditions	**All participants**	78.8%	16.5%	11.4%	**0.000**
	Males	78.2%	17.9%	3.8%	0.9
	Females	79.8%	16%	4.3%	
	Preclinical	71.2%	23.5%	5.3%	**0.000**
	Clinical	93.8%	4.2%	2.1%	
13. the student can correctly identify the World Health Organization's definitions of overweight, obese, and morbidly obese patients	**All participants**	31.6%	41%	27.5%	0.022
	Males	33.3%	37.2%	29.5%	0.7
	Females	30.9%	42.6%	26.6%	
	Preclinical	30.6%	40%	29.4%	0.6
	Clinical	33.3%	42.7%	24%	
14. The student can provide a differential diagnosis list for obesity	**All participants**	28.4%	38.8%	32.8%	0.110
	Males	29.1%	40.5%	30.4%	0.8
	Females	28%	38.1%	33.9%	
	Preclinical	21.5%	43.6%	34.9%	**0.003**
	Clinical	40.6%	30.2%	29.2%	

Table 1: Main findings of the present survey.

Discussion

To date, obesity is a growing public health problem. Its prevalence in childhood has dramatically increased in the past three decades [3]. In addition to obesity-related medical challenges, overweight/obese children may experience significant psychosocial distress and a lower quality of life. They are also more likely to become obese adults. Childhood obesity leads to early puberty in girls, type 2 diabetes, metabolic syndrome and adult obesity. These effects increase cardiovascular disease and cancer risks, likely due to insulin resistance and chronic inflammation [6]. Children between 5 and 13 years old are more likely to see their general dentist than their physician, so dental appointments can be opportunities to improve overall child health. That's why the dentist needs to diagnose obese children [7].

The present study aimed to assess the knowledge and attitudes of future dentists toward obese children. Regarding the total number of hours that have been devoted to the topic of obesity since the beginning of dental studies, 51.1% of participants

reported (0-1) hours. 32.7% of them reported (2-5) hours. Only 12.7% reported more than 6 hours. A statistically significant difference was reported according to sex. Females reported more important devoted hours. It means that the topic of obesity and overweight seems to be more interesting for female than male students. It can also be explained by the higher percentage of obese women in Tunisia [2]. However, the difference was not as significant between clinical and preclinical dental students. They strongly suggest that dental curricula do not include a substantial, dedicated program focusing on obesity.

In a study conducted by Magliocca KR, et al., similar percentage of students reported dedicating 5 hours or less to the topic of obesity since starting their dental studies: 39% reported 0-1 hours and 43% reported 2-5 hours [4]. Most of the respondents reported more sufficient knowledge about adult overweight and obesity (64.9 %) than overweight and obesity in children (58.1%) (p=0.000). A survey among dental students in Saudi Arabia reported, as well, that 83% of them report a great level of knowledge of obesity in adults but only 63% in children [5].

This observed difference could be attributed to three key factors explained by Wyne, et al. [5]. First, dental curricula tend to focus more extensively on adult overweight and obesity than pediatric cases. Second, assessing weight status is simpler in adults, where a straightforward BMI calculation (≥25 for overweight, ≥30 for obesity) suffices, unlike children requiring age- and gender-specific BMI percentile comparisons. Third, dental students likely encounter more media coverage about adult weight issues than childhood obesity, potentially influencing their awareness and knowledge base. These explanations are all highly applicable to the Tunisian context.

 Regarding obesity assessment tools for both adults and children, most Tunisian dental students favored methods using both height and weight. Specifically, the majority (56.5%) identified BMI as the most suitable tool, followed by weight/height ratio (29.1%). This contrasts with a Saudi Arabian study where only 34% chose BMI [5]. For pediatric cases, growth charts serve as the primary tool for evaluating overweight and obesity status. Interestingly, some studies suggest that visual assessment may also represent a viable supplementary method in children [8]. In fact, the American Academy of Pediatrics published in 2010 that the majority of respondents reported visually screening children for overweight in addition to routinely measuring height and weight. Half stated they assess BMI for children older than 2 at most or all visits [8].

In the present study, females were significantly more aware of overweight and obesity and greater inclination to identify and prevent overweight and obesity than males. This difference may be related to the fact that females in Tunisia have a greater prevalence of obesity 36% compared to males 20%. A recent Tunisian study reported that the prevalence rate of overweight was higher for men (41%) than women (31%, p<10-6). While the prevalence rate of obesity was higher in women (36%) than in men (20%) [2].

A statistically significant difference was observed between clinical (71.9%) and preclinical (48.3%) students (p=0.004). It means that the emergence in the clinical stage and the direct contact with patients may have improved the students' knowledge and skills. Also, a statistically significant difference was reported between females and males (0.03). This could be attributed to the fact that male students were less likely to use the BMI assessment than female students and some males were more inclined to rely on weight measurement and visual assessment than females.

The majority of the respondents are aware about overweight and obesity in Tunisia in adults (45.1%) more than in children (25%) (p=0.000). Most of them, as well, believe that dentists should have a role in the identification and prevention of obesity, with a higher proportion endorsing this role in children (86.2%) as compared to adults (78%) (p=0.000).

The study by Kharma, et al., reported that weight screening in dental offices can encourage healthy behaviors, improving both weight and oral health while reducing systemic risks [1]. Dentists should note that children with obesity may face a higher risk of dental erosion but not necessarily more cavities than normal-weight children. To treat obesity through dietary restriction, methods such as Oral Jaw Wiring (OJW), Maxilla-Mandibular Fixation (MMF) or Dental Device Systems (DDS) have been proposed to prevent overeating [1]. When asking if the student had taken other courses about obesity prior to dental studies, we found that nearly half of the students (40.7%) declared that they had not had any courses or education about the subject of obesity and 23.9% were neutral. This is consistent with the findings of Magliocca KR, et al., who reported that 51% of the students had never received obesity education, 37% had some prior exposure and 13% were unsure [4].

The findings regarding the number of hours dedicated to obesity education highlight a concerning lack of training on this topic prior to entering professional education. This gap can be attributed to the absence of obesity-related content in secondary school curricula in Tunisia and the special training of healthcare professionals. Notably, the majority of surveyed students expressed a strong interest in learning more about obesity. In a study conducted in Saudi Arabia 39% of dental students reported dedicating one hour or less in the curriculum to obesity. Among dental students, 43% indicated having received between two and five hours of obesity-related education. The majority (92%) reported five hours or less of training. When comparing different academic years (first year, second year, etc.) within the predoctoral dental curriculum, no significant difference was found in the number of education hours [5]. In a study realised in the UK and Ireland just 31.6% of students, including those in dental and dietetics programs, believed they had received adequate training on the connection between diet and dental health [9]. In the USA, pediatric dental residents reported that the most frequently significant barriers to obesity related education were the lack of personnel knowledge or training personnel about childhood obesity [10]. In the UK most dental students (82.4%) reported having received zero to four hours of training, while only 35.1% believed their training in dietary patient management was adequate [11]. In the United States, according to a survey, 47% of residents stated they had been taught through a formal curriculum on managing overweight or obese patients [12]. Given that obesity is a relatively emerging problem in Tunisia, efforts should prioritize prevention-particularly in children, as early intervention can prevent childhood obesity from persisting into adulthood. Integrating this topic into dental education would be highly valuable, especially since the students surveyed showed a strong interest in further education on the matter. Undergoing training on childhood obesity would be beneficial to pediatric dentistry residents in Tunisia.

Fifty-nine percent of students recognized obesity as a chronic disease, while 78.8% were aware of its association with serious medical conditions. A statistically significant difference was reported between clinical (93.8%) and preclinical (71.2%) students (p=0.000). Obesity was first classified as a disease in the International Classification of Diseases in 1948. In 1997, the WHO classified obesity as a distinct chronic disease. In the American Medical Association's 2013 declaration and the European Commission's 2021 formal classification, obesity is recognized as a chronic relapsing disease acting as a gateway "to a range of other non-communicable diseases" [13].

In response to whether they agree that obesity is associated with serious medical conditions, more than three-quarters of the respondents expressed their agreement. A clear distinction appears between clinical and preclinical students (p=0.000) with 93.8% of clinical students against 71.2% of preclinical students. Obesity frequently leads to metabolic syndrome, characterized by a cluster of conditions including abdominal obesity, insulin resistance, elevated triglycerides, low HDL cholesterol, high blood pressure and impaired fasting glucose. While diagnostic criteria vary slightly, abdominal obesity emerges as the most predictive factor for metabolic syndrome development in children and adolescents [6].

The majority of respondents (84.4%) recognized the medical value of modest weight loss. Research indicates that even a 5-10% reduction in body weight can improve health outcomes, including reduced medication needs for diabetes and hypertension. This awareness may stem, at least in part, from widespread media coverage of obesity-related health risks and the advantages of weight management [4].

A minority (31.6%) expressed confidence in their understanding of the WHO obesity classification of patient types. Magliocca KR, et al., found roughly equal percentage for the answer to this question (less than 40%). 40.6% of clinical students could provide a differential diagnosis for an obese patient, while only 21.5% for preclinical ones (p=0.003) [4]. These results could be explained by the fact that the clinical stage could increase awareness and knowledge about obesity and overweight. It could be inferred that the students' understanding of obesity is based on general knowledge rather than on academic sources.

Conclusion

This study is the first to address obesity and overweight in the Tunisian population, revealing that dental students perceive their obesity education as limited, regardless of gender or clinical experience. The comparison between the two sexes was almost statistically significant in favor of females, which could be explained by their higher motivation and awareness about the topic. Furthermore, a significant difference between clinical and preclinical students suggests that practical experience and patient interaction significantly influence dental students' awareness and beliefs. This study underscores the dentist's role in identifying obese patients and their potential as a preventive link to other medical specialists.

Conflict of Interest Statement

All authors declare that there are no conflicts of interest.

Informed Consent Statement

Informed consent was taken for this study.

Authors' Contributions

All authors contributed equally to this paper.

Financial Disclosure

The authors received no external financial support for this study.

Data Availability Statement

Not applicable.

Ethical Statement

Ethics Committee of the Faculty of Dental Medicine, Monastir, Tunisia

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