European Journal of Nutrition & Food Safety

13(2): 95-102, 2021; Article no.EJNFS.66811
ISSN: 2347-5641

Dietary Habits and Anthropometric Measures of a Dental Student Population

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Authors' contributions

This work was carried out in collaboration among all authors. Authors JMP and KK were responsible for the overall project design. Authors ARY and PHS were responsible for data generation. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/EJNFS/2021/v13i230379
Editor(s):
(1) Dr. Rasha Mousa Ahmed Mousa, University of Jeddah, Saudi Arabia.
Reviewers:
(1) Michael Bordonaro, GCSOM, USA.
(2) Yulu, Jilin University, China.
Complete Peer review History: http://www.sdiarticle4.com/review-history/66811

Original Research Article

Received 12 January 2021
Accepted 20 March 2021
Published 27 March 2021

ABSTRACT

Introduction: Health professionals are expected to understand the relationship between diet and nutrition and overall health. Many relationships between oral health and diet and nutrition are known to contribute to health or disease development. However, few studies to date have evaluated the current dietary habits and behaviors of dental students in the United States. The objective of this study was to complete a longitudinal study of diet and exercise behaviors among dental students during their academic experience at UNLV SDM.
Methods: Using and Institutional Review Board (IRB) approved protocol, students in four dental cohorts were asked to take a survey regarding their dietary behaviors, nutrition intake and exercise. A total of n=302/327 students participated, yielding an overall response rate of 92.3%. Self reported age, ethnicity and body mass index (BMI) were also collected.
Results: A total of n=302 students completed the survey, for an overall response rate of 92.3% (n=302/327). Males represented 57.9% of respondents, which closely matched the overall percentage of males among the student population overall (56%, P=0.6870), while the percentage of minority respondents in the study sample (58.9%) was slightly higher than in the overall student population (51.6%, P=0.1095). Self-reported height and weight were higher among males (as

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expected) – although body mass index (BMI) measuring the ratio of height-to-weight was lower for females (24.53 +/- 4.65) than males (26.15 +/- 3.84), P=0.3711. To determine if dietary factors may account for these differences both positive dietary health behaviors (fruit and salad consumption) and negative health behaviors (processed snacks and sugar sweetened beverages) were assessed. Females reported higher consumption of fruits and salads (P=0.0131) and lower consumption of processed foods and snacks (P=0.0114) than males. However, analysis of exercise found that males reported more sessions of physical activity per week than females (P=0.023) and also reported more overall minutes of vigorous exercise (P=0.002).

Conclusion: Although many populations face significant dietary and related behavioral challenges, medical and dental students face particular stress and time-limited challenges that may negatively influence positive health outcomes. In addition, the perceived clinical relevance of nutrition education may impact future dietary and nutrition-related discussions and provider recommendations. This is among the first dietary studies of self-reported dental student dietary patterns and health behaviors, which demonstrates areas for education and improvement may be needed to increase student wellness, overall health and well-being - as well as targeted points for clinical education that might increase the perceived relevance of dietary and nutrition education.

Keywords: Nutrition; diet; exercise; BMI; dental students.

1. INTRODUCTION

Health professionals are expected to understand the relationships between diet and nutrition and overall health [1,2]. One important aspect of these relationships is the link between poor diet and poor health outcomes, such as the development of cancer [3-5]. Another critical aspect is the relationships between good diet and disease prevention or positive health outcomes [6,7].

Many relationships between oral health and diet and nutrition are known to contribute to oral health or oral disease development [8,9]. The most widely explored associations have been the relationships between the development of dental caries (cavities) and dietary intake of simple sugars and carbohydrates [10,11]. Less widely known are the relationships between poor diet and nutrition and development of other oral diseases, including periodontal disease [12,13].

However, few studies to date have evaluated the current dietary habits and behaviors of dental students in the United States [14]. Some information is known about the training and assessment of medical students, although these studies are also relatively rare [15-17]. As more dental and medical students incorporate diet and nutrition studies into the curriculum, it becomes more important to understand the current state of medical and dental student dietary habits to focus on specific areas of concern [18-20].

Based upon the lack of evidence in this area, the objective of this study was to complete a study of diet and exercise behaviors among dental students during their academic experience in a first-year diet and nutrition course.

2. METHODS

2.1 Human Subjects

The original study was reviewed and approved by the Office for the Protection of Research Subjects (OPRS) and Institutional Review Board (IRB) at the University of Nevada, Las Vegas (UNLV) under the protocol #1309-4554M “Health Status of Dental Student Population” on October 30, 2013. Participation was voluntary and all volunteers provided Informed Consent. Inclusion criteria included dental students enrolled at UNLV School of Dental Medicine (SDM) aged 18 – 50 years old.

The current study was reviewed and approved by the UNLV IRB and OPRS under protocol #1607120-2 titled “Retrospective analysis of Health Status of Dental Student Population” on May 21, 2020 as Exempt. In brief, this survey included basic demographic information (Sex, Age, Race/Ethnicity) and several questions related to dietary behaviors, nutrition intake and exercise. No identifying information was requested or collected, such as student identification number.

2.2 Data Collection

All student responses were coded and input on a secure computer server maintained by UNLV-SDM using Microsoft Excel. Each student response was assigned a unique identification number to specify which dental student cohort

they were enrolled with but no personally identifiable information was available or recorded. The 26-item dietary screener questions (DSQ) estimates food frequency for items including fruit, vegetable and salad consumption, as well as processed snacks and sugar sweetened beverages.

2.3 Statistical Analysis

Most responses from the DSQ involved continuous parametric data, therefore descriptive statistics (number and percentage) were reported for basic demographic information regarding each student cohort and the overall sample. Analysis of differences between the study sample (n=302) and the overall student population (n=327) was analyzed using Chi Square analysis. Food frequency data from each specific question were analyzed using box-and-whisker plots, that includes the Tukey method for plotting interquartile range (IQR) between the 25^{th} and 7^{th} percentiles. Any differences between response categories (Males, Females) were evaluated using Student's t-tests, which are appropriate for the evaluation of parametric data. Analysis involved more than two t-tests was verified using analysis of variance (ANOVA) and the R Statistical Analysis software from IBM.

3. RESULTS

More than 300 voluntary student responses were analyzed from the four cohorts of dental students, yielding an overall response rate of 92.3% (n=302/327) for this survey (Table 1). More specifically, males represented 57.9% of respondents, which closely matched the overall percentage of males among the student population overall (56%), P=0.6870. Analysis of race and ethnicity demonstrated that the percentage of minority respondents in the study sample (58.9%) was slightly higher than in the overall student population (51.6%) – although this was not statistically significant, P=0.1095. The majority of non-White student respondents were Asian (40.7%). The average age for females from the study sample was 26.1 yrs compared with 27.3 years for males, which was not statistically significant, P=0.224.

In addition to basic demographic information (Sex, Age, Race or Ethnicity), respondents were also asked to provide anthropomorphic measures, including height and weight (Fig. 1). More specifically, the average height for females was 64.02 in. +/- 2.98 compared with the average height for males of 70.42 in. +/- 2.29, which was statistically significant – as expected, P=0.0313. In addition, self-reported weight for females (142.69 lbs. +/- 26.63) was lower than average weight of males (184.33 lbs. +/- 27.28) in the study sample, which was also statistically significant – as expected, P=0.0411. These data that allowed for the calculation of body mass index (BMI) measuring the ratio of height-to-weight, which was lower for females (24.53 +/- 4.65) than males (26.15 +/- 3.84), which was not statistically significant, P=0.3711 – although this difference was not expected as BMI represents the ratio of height-to-weight which should account for the lower height and weight of females to yield similar BMI to males.

To determine any potential factors that might account for the lower BMI observed among females – an analysis of positive dietary health behaviors, including fruits/vegetables and green salad consumption was completed for both females and males (Fig. 2). This analysis revealed that females reported average weekly frequency of fruit and vegetable consumption of 6.92 +/- 2.91, which was significantly higher than males 3.62 +/- 2.63, P=0.0128. In addition, the average weekly frequency of green salad consumption among females was 3.44 +/- 1.63, which was also significantly higher than among males, which had a reported weekly frequency of 2.28 +/1 1.13, P=0.0131.

To determine any potential factors that might account for the higher BMI observed among males – an analysis of negative self-reported health behaviors, including processed snack and sugar sweetened beverage (SSB) consumption was also completed for both males and females (Fig. 3). This analysis revealed the number of processed snacks consumed by males per week 6.18 +-/ 2.37 was significantly higher than reported by females 4.685 +/- 2.34, P=0.0114. Furthermore, weekly frequency of sugar sweetened beverage consumption was also significantly higher among males 3.65 +/- 1.7 than females 1.91 +/- 0.33, P=0.0221.

Finally, to determine if the differences in overall BMI between males and females might be due to factors other than dietary intake – an analysis of exercise was completed for both males and females (Fig. 4). These data demonstrated that males reported more physical activity per week (305 minutes) than females (190 minutes), which was significantly significant, P=0.002. In addition, the number of exercise sessions per week reported by males (4.5 per week) was also significantly higher than among females (2.0 per week), P=0.023.

Table 1. Demographic analysis of study sample

	Study sample (n=302)	Student population (n=327)	Statistical analysis
Sex			
Females	42.1% (n=127)	44%	$\chi 2=0.162$, d.f.=1
Males	57.9% (n=175)	56%	P=0.6870
Race/Ethnicity			
White	41.1% (n=124)	49.4%	$\chi 2=2.561$, d.f.=1
Minority	58.9% (n=178)	51.6%	P=0.1095
Asian	40.% (n=123)		
Hispanic/Other	17.2% (n=52)		
Black	0.9% (n=3)		
Age			
Females	Average = 26.1 yrs.	Range 21-31 yrs.	Two-tailed t-test
Males	Average = 27.3 yrs.	Range 23 – 38 yrs.	P=0.224

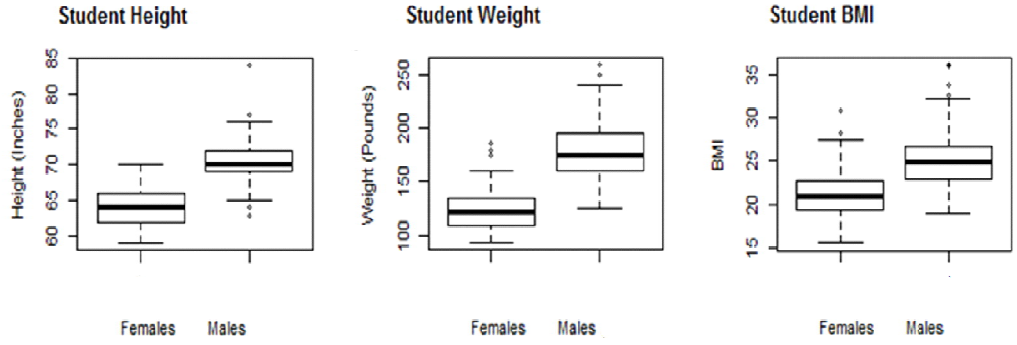

Fig. 1. Self-reported quantitative body measurements of study sample. Average height was higher among males (70.42 +/- 2.29 inches) than females (64.02 +/- 2.98), P=0.0313. Average weight was higher among males (184.33 +/- 27.28) than females (142.69 +/- 26.63), P=0.0411. Body mass index (BMI) calculated as the ratio of height-to-weight for males was 26.15 +/- 3.84 and 24.53 +/- for females, which was not significant, P=0.3711

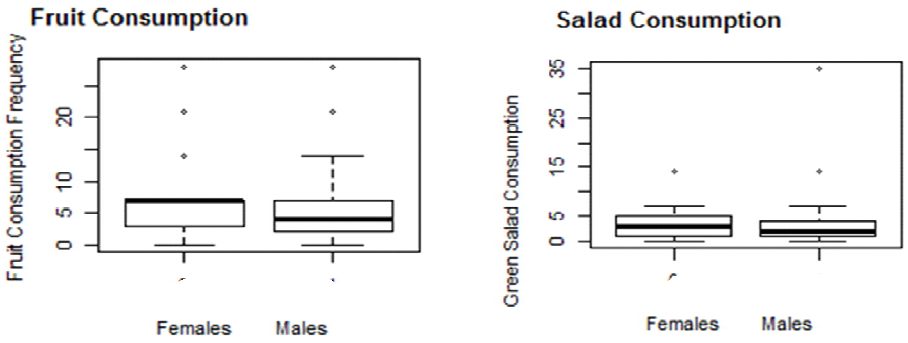

Fig. 2. Positive self-reported health behaviors; Females reported higher weekly consumption of fruits (and vegetables) than males, which was significant and consistent among all cohorts (P=0.0128). Other positive health behaviors, such as salad consumption (low energy dense, high nutrient) were higher among females compared with males, which was also consistent among all cohorts (P=0.0131)

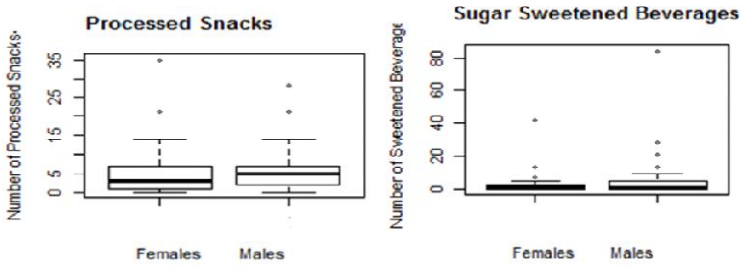

Fig. 3. Negative self-reported health behaviors. Males reported higher average weekly consumption of highly processed foods and snacks than females, which was significant and consistent among all cohorts (P=0.0114). Other negative health behaviors, such as consumption of sugar sweetened beverages (high energy density, low nutrient value) were higher among males compared with females, which was also consistent among all cohorts (P=0.0221)

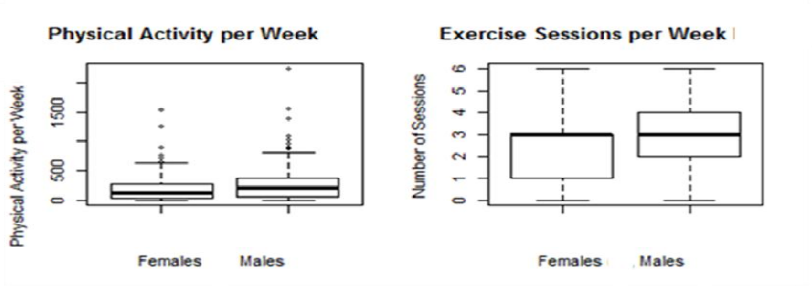

Fig. 4. Self-reported weekly exercise. Males reported significantly more physical activity and exercise (305 minutes per week) than females (190 minutes), P=0.002. The number of dedicated exercise sessions was also significantly higher among males (4.5 per week) compared with females (2.0 per week), P=0.023

4. DISCUSSION

The recent trend for more dental and medical schools to incorporate diet and nutrition studies into the curriculum makes it important for educators and researchers to understand the current state of medical and dental student dietary habits to focus on specific areas of concern [21,22]. Based upon the lack of evidence in this area, the objective of this study was to complete a study of diet and exercise behaviors among dental students during their academic experience in a first-year diet and nutrition course [23,24]. This study successfully evaluated the responses from more than three hundred dental students regarding their dietary and physical activity behaviors - providing one of the most robust and extensive evaluations of this type among dental students in the US.

These findings revealed major differences between male and female students and their responses. For example, females reported significantly higher levels of fruits and vegetables consumed - a sign of positive dietary habits and health behaviors similar to other reports of college and university-level females evaluated in a large systematic review [25]. In addition, male students reported significantly higher consumption of processed foods and snacks, as well as sugar-sweetened beverages - confirming previous studies of negative health behaviors observed among college- and university-level males [26]. However, males reported much greater frequency and length of physical activity than females - a different positive health behavior, which also seems to confirm previous reports among college- and university-level students [27,28].

These findings are significant because previous studies have demonstrated that dietary and exercise behaviors of dental students are integrally related to incorporating these

recommendations into clinical practice [29]. A systematic review of this literature confirms that the most likely impact on medical and healthcare curriculum takes place only when the instruction targets the specific deficits of those student populations [30]. An understanding of the positive and negative health behaviors of dental students is therefore necessary to provide more targeted and specific curricular instruction to highlight and demonstrate the clinical and practical relevance of dietary and nutrition information, which in turn may lead to more effective and informed recommendations for their future patients [31,32].

An additional important consideration is the fact that BMI only indirectly correlates with health status, since other factors such as muscle mass and overall muscularity may inappropriately increase BMI measurements [33]. In addition, these classifications for BMI were designed using White, Hispanic and Black individuals – which may mean that the cutoffs might potentially underestimate overweight and obesity risk among particular Asian and South Asian populations [34]. However, since most of the study participants in the current study were not fitness or sport majors (reducing the likelihood of significantly higher muscularity), reported being either in class or studying an estimated 50 – 60 hours per week (thereby increasing the odds of sedentary behaviors), and were mostly White or Hispanic – this may suggest the findings of this study may be significant and may correlate with other studies of BMI trends among youth and young adults in the US and therefore may warrant further investigation [35].

5. CONCLUSION

Although many populations face significant dietary and related behavioral challenges, medical and dental students face particular stress and time-limited challenges that may negatively influence positive health outcomes. In addition, the perceived clinical relevance of nutrition education may impact future dietary and nutrition-related discussions and provider recommendations. This is among the first dietary studies of self-reported dental student dietary patterns and health behaviors, which demonstrates areas for education and improvement may be needed to increase student wellness, overall health and well-being - as well as targeted points for clinical education that might increase the perceived relevance of dietary and nutrition education.

CONSENT

Participation was voluntary and all volunteers provided Informed Consent. Inclusion criteria included dental students enrolled at UNLV School of Dental Medicine (SDM) aged 18 – 50 years old.

ACKNOWLEDGEMENT

The authors would like to acknowledge the presentation of preliminary data from this manuscript at the International Association for Dental Research (IADR) conference.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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DOI: 10.1001/jama.2018.3060.
PMID: 29570750; PMCID: PMC5876828.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/66811