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Research Article

Assessment of Dental Students Knowledge and Confidence in Managing Patients with Multiple Sclerosis

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Abstract

Background: Multiple sclerosis (MS) is a chronic inflammatory autoimmune disease that affects the central nervous system. Given that MS involves various head and neck symptoms, awareness of the condition can assist dental professionals in recognizing the disease, adjusting dental treatment plans, and collaborating with healthcare teams. Therefore, this study aims to assess awareness and knowledge about MS among dental students.

Methods: This is a cross-sectional study conducted among students in the Faculty of Dental Medicine, Umm Al Qura University, Makkah, Saudi Arabia. A structured questionnaire including questions on MS knowledge was administered. Statistical analysis will be conducted using SPSS software, with results assessed for significance at $\alpha < 0.05$.

Results: A total of 208 students were enrolled in this study. Dental students generally exhibit a good understanding of multiple sclerosis and show sufficient awareness of its oral manifestations, and the dental care required for MS patients. Female students demonstrate greater knowledge than their male counterparts. However, there were no statistically significant differences in general knowledge and awareness of the oral manifestations of MS between the two genders or across different academic levels. When asked about dental management of MS patients fourth-year students and interns provided more correct answers than students at other levels. Finally, all students did not have enough confidence to treat MS patients except for fourth-year students who interestingly showed higher knowledge.

Conclusion: Although overall MS knowledge levels among dental students were sufficient, they lack confidence in treating MS patients.

INTRODUCTION

Multiple sclerosis (MS) is a chronic inflammatory autoimmune disease that affects the central nervous system (Kamm et al., 2014). It is the most prevalent autoimmune condition in young adults, causing demyelination and axonal loss of the neurons. The primary clinical manifestations in the head and neck region include cranial neuralgias, facial paralysis, temporomandibular problems, visual complications , dysphagia, and dysarthria (Covello et al., 2020).

Globally, the prevalence of MS ranges from 15/100,000 to 250/100,000, with roughly 2.5 million cases affected (Algahtani et al., 2017; Confavreux & Vukusic , 2006). Since 1990, the prevalence of MS has increased significantly in several regions, particularly in many low and middle-income nations around the globe leading to significant economic and healthcare costs (AlJumah et al.,

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2020; Karikari et al., 2018; Browne et al., 2014; Mohammadi, 2011).

Unfortunately, the clinical manifestations of MS appear to be heterogeneous not only between patients but also within the same patient (Pugliatti et al., 2006). MS has a long duration and higher prevalence among young adults. Since it starts at a younger age, MS will lead to early physical disability, fatigue, comorbidity , and the need for assistance in daily activities. Therefore, MS has a higher social burden even when compared to stroke and Alzheimer's disease (Pugliatti et al., 2006).

Multiple studies have been conducted to investigate MS knowledge and awareness among the Saudi population, one study conducted in Jeddah reported that there is no significant association between public knowledge and demographic data, but there was a significant correlation between the educational level and knowledge level (Farran et al., 2021). Poor knowledge was found among the population in the western region of Saudi Arabia specifically in Jeddah (Dahlawi et al., 2022). Interestingly females tend to have higher knowledge about MS when compared to males (Al-Hamdan et al., 2021).

Oral side effects of medications were documented , xerostomia being the most prevalent, followed by dysgeusia, dysphagia, mouth ulcers, sinusitis, and gingivitis (Cockburn et al., 2017). It is widely recognized that MS patients experience various oral symptoms , making it probable for them to visit the dental clinic. Therefore, dentists must possess adquate knowledge of MS to effectively treat and manage MS patients during dental appointments (Covello et al., 2020). Moreover, dental students must acquire a comprehensive understanding of MS due to its potential oral manifestations and impact on oral health. Knowledge about MS aids dental professionals in recognizing symptoms, adapting treatment plans, and collaborating effectively with healthcare teams.

Few studies were conducted on MS awareness among medical students in Saudi Arabia. For example, a cross-sectional study conducted in the Makkah region of health-related colleges found that there is sufficient knowledge of MS among fifth-year medical students (Kabli et al., 2021). None of these studies were conduct-ed specifically for dental students in Makkah. Therefore, this study aims to assess dental students' knowledge and confidence in the dental management of patients with MS among dental students at the Faculty of Dentistry at Umm Al-Qura University in Makkah, Saudi Arabia.

MATERIALS AND METHODS

Study Design, Sample Size, and Criteria

This is a cross-sectional study conducted in the Collage of Dental Medicine, Umm Al-Qura University, Makkah, Saudi Arabia among dental students both males and females from the 2nd year to interns during the period from February to April 2023. The study was approved by the institutional Research Board review of Umm Al-Qura University (IRB# HAPO-02-K-012-2023-02-1482).

All participants provided written informed consent, and all tenets of the Helsinki Declaration were strictly followed throughout the various phases of the study.

Data were collected via an electronic survey made by Google Forms which was distributed to 270 student's emails and the Faculty of Dentistry dental clinic social media accounts. The aim of the study and consent of voluntary participation were presented on the first page of the questionnaire followed by a consent form. Those interested had access to a self-administered closed-ended questionnaire. The questionnaire was piloted on 10% of the subjects excluded from the study and was amended based on their feedback. The questionnaire included four parts: demographic data, questions related to general knowledge about the nature of MS disease, oral manifestation of MS and finally, questions related to MS dental management.

Statistical analysis was performed on all the responses after being coded. The data was then tabulated and analysed by IBM SPSS Statistics version 23.0. Descriptive statistics were used to summarize frequency and percentages. Chi-square test was used to detect the correlation between independent and dependent variables. $P \leq 0.05$ was considered statistically significant.

RESULTS

A total of 208 students completed the study questionnaire , 10 (52.9%) were female and 98 (47.1%) were male. Out of the 208 participants, 110 (52.9%) were females and 98 (47.1%) were males. From each academic year, 15%-22% of students participated in the study. While only 6.3% of interns participated (Table 1). Participation in the study ranged from 15% to 22% of students in each academic year, with only 6.3% of interns taking part (Table 1).

Students were asked about their source of knowledge about MS and the majority (63%) reported that it was from academic lectures (Table 1). There was a statically significant difference among different academic level and their source of knowledge about MS. Fifth-year students reported relaying mostly on research articles as their MS source of knowledge ($p= 0.024$), while sixth-year mainly on social media ($p=0.020$) compared to second year who depended primarily on academic lectures ($p=0.013$).

In addition, students were asked if they had any family members diagnosed with MS. Among all participants, only 16 (7.7%) students had a relative with MS compared to 192 (92.3%) did not.

Table 1: Demographics Data of Participants.

Characteristics	Category	Frequency	(%)
Gender	Female	110	52.9%
	Male	98	47.1%
Academic year	2nd year	43	20.6%
	3rd year	32	15.4%
	4th year	46	22.1%
	5th year	37	17.8%
	6th year	37	17.8%
	Interns	13	6.3%
Source of knowledge	Research article	49	23.6%
	Social media	28	13.4%
	Academic lectures	131	63.0%

General knowledge about MS

Results regarding students' knowledge about MS are summarized in (Supplementary Table 1) and (Figure 1). Majority of the students knew that MS is an illness of CNS 126 (60.6%) and 38 (39.9%) of the students knew that MS is not a hereditary disease or contiguous in its nature 127(61.1%). On the other hand, most of the students knew that it is an autoimmune disease 142 (68.3%) and 121 (58.2%) know the age of onset of MS manifestation which is from 20-40 years old.

There was no statistically significant difference between both genders regarding MS general knowledge. However, female students reported that were provided with sufficient knowledge regarding MS during academic years when compared to male students (p=0.027).

There was no statistically significant difference in MS general knowledge among students in different academic years except for MS not being a hereditary disease where fourth-year students reported the highest correct answers compared to other years with a statistically significant difference (p= 0.039). The distribution of correct general knowledge about MS among different academic levels of the participants is shown in (Figure 1).

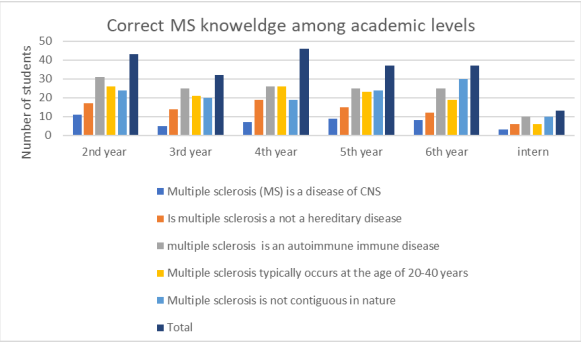

Figure 1: Distribution of MS correct knowledge among different academic levels.

Knowledge about Orofacial manifestation of MS

Dentists should have the required knowledge regarding MS orofacial manifestation to be able to recognize it and manage it in the dental clinic. In this cohort, 141 (67.8%) of the participants had sufficient knowledge regarding MS orofacial manifestation (Table 2). More than half of the participants (65.9%) reported correct information about MS signs and symptoms of the head and neck region which include: cranial neuralgia, facial paralysis, and TMD. Only 83 (39%) knew about the relationship between gingivitis or periodontitis and MS. There was no statistically significant difference between both genders regarding MS oral manifestations . No significant difference was found in knowledge regarding oral manifestation among different academic levels.

Table 2: Orofacial Manifestations of Ms

Question	Answers	N (%)
Does multiple sclerosis (MS) have orofacial manifestations ?	Yes *No I don't know	141 (67.8%)13 (6.4%) 54 (26.0%)
According to your knowledge what is the most well-known signs and symptoms of head and neck region ?	Cranial neuralgias Facial paralysis Temporo-mandibular disorder All of above *	30 (14.4%)34 (16.3%)7 (3.4%)137 (65.9%)
Is there any association between gingivitis and periodontitis and MS?	Yes *No I don't know	83 (39.9%) 12 (5.8%)113 (54.3%)

Knowledge about MS Management

It is crucial for dental students to have sufficient knowledge about dental management of MS patients and to have the confidence to treat these patients.

When dental students were asked about the appropriate dental management of MS patients (Table 3), the results showed that 143 (68.8%) of the students believed that MS patients needed special investigations prior to dental interventions including MRI 143 (68.8%) while 28 (13%) selected panoramas.

Most of the students 154 (74%) had enough knowledge regarding oral hygiene instructions for MS patients, which consist mainly of using electric toothbrushes, flossing devices, stripping water or sugarless drinks, and salivary substitutes.

When comparing different academic levels regarding their knowledge in managing patients no statistically significant difference was found, however, fourth-year students and interns showed a higher frequency of correct answers compared to others (Figure 2).

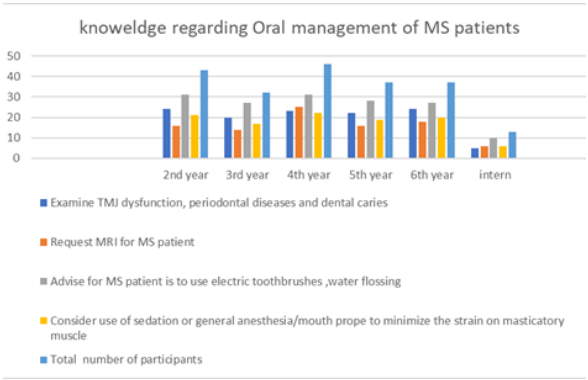

Figure 2: Knowledge about MS oral manifestation among dental students.

Regarding the confidence to treat MS patients in the dental office, most of the participants 138 (66.3%) were not confident to treat them, while 70 (33.7%) reported their readiness to treat these patients. Although not statically significant, fourth-year students, who reported the highest score of correct answers regarding management of MS, were more confident in treating MS patients compared to other students. In contrast, intern students showed less confidence in managing patients compared to their satisfactory knowledge (Figure 3).

DISCUSSION

MS is the most common non-traumatic incapacitating disease that affect young adults (Dobson & Giovannoni, 2019). Unfortunately, few epidemiological hospital-based studies reported the prevalence of MS in Saudi Arabia. Moreover, most of these studies reported an increasing incidence of MS in Saudi Arabia. Similar results were reported recorded in the west however, the course and disease evolution are different (AlJumah , Bunyan, et al., 2020; AlJumah , Otaibi, et al., 2020; Daif et al., 1998; Yaqub & Daif , 1988). The prevalence of MS in Saudi Arabia is estimated to be 30–40/100,000 and this number appear to be increasing (Bohlega et al., 2013). It is crucial for health care providers to have sufficient knowledge about MS to provide the appropriate managements for these patients in all heath related specialities. As part of health care team dentists not only need to have enough knowledge about MS but also, they need to have sufficient knowledge to be confident to treat these patients.

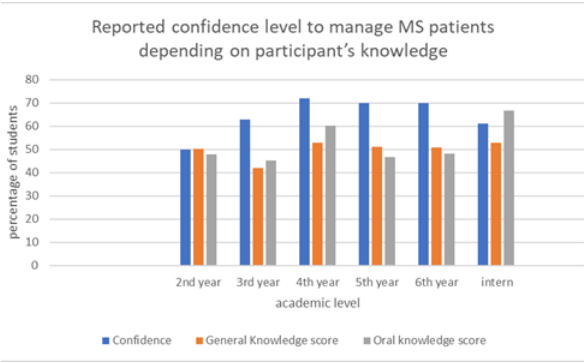

Figure 3: Reported confidence level to treat MS patients in relation to MS general and oral knowledge.

The current study has demonstrated that dental students have sufficient knowledge regarding MS. Including the affected tissues, cause of the disease and age of onset. These results confirm a result of previous study conducted among different health health-related students in Umm Al-Qura University (Kabli , 2021). Interestingly , in this study fourth year students showed highest level of knowledge regarding MS, this could be explained by the fact that these students were recently taught a subject regarding dealing with medically comprised patients. Since fifth, sixth years students and interns showed less knowledge than fourth year students it is recommended to have a follow up subject to strengthen their knowledge about the disease.

It well known that MS patients suffer from orofacial manifestation including orofacial pain, trigeminal neuralgia and TMD (Costa et al., 2022; Zhang & Meng, 2015). It is crucial for dentists to recognize these symptoms and have the sufficient knowledge to be able to treat MS patients. In this study, more than 50% of the students demonstrated sufficient knowledge about MS orofacial manifestation and were able to recognize signs and symptoms such as cranial neuralgia, facial paralysis, and TMD. These results indicate that students at the Collage of Dental Medicine, Umm Alqura University received adequate education regarding MS and its orofacial manifestation. Although dental students were able to recognize orofacial manifestation of MS there is clearly a gap of knowledge regarding the relationship between gingivitis and periodontitis and MS.

Table 3: Management of MS

Question	Answers	N (%)
Which of the following would be appropriate for management of MS patients in dental clinic	Examine for TMJ dysfunction, periodontal diseases, or dental caries. *Consider the use of sedation or general anesthesia or mouth prop to minimize strain on masticatory muscles. Rule out dental causes for orofacial pain No special management	118 (56%) 105 (50%)77 (37%)24 (11%)
Do you think MS patients need to prior investigation	Yes *No I don't know	143 (68%) 20 (9%)45 (21%)
What type of special investigation would you request for MS patient	MRI* Panorama Bitewing	95 (45.7%)27 (13.0%)86 (41%)
Which of the following oral hygiene instructions should be advise for MS patient	Use electric toothbrushes and flossing devices. Stripping water or sugarless drinks Using salivary substitutes All of above *	28 (13%)11 (5%)15 (7%)154 (74%)

This could be explained by the fact that this relation is not well studied and well established yet (Al-Ansari, 2021).

A fundamental understanding of dental management for patients with multiple sclerosis is essential for dentists to ensure they provide appropriate and effective treatment options for these individuals. Furthermore, Among the cohort tested in this study it appears that majority of dental students have adequate knowledge regarding dental management of MS patients including prior investigations and oral hygiene instructions.

Interestingly, although dental students seem to have sufficient knowledge regarding MS and its orofacial manifestation and management, they don't have the confidence to treat MS patients in the dental office. This could be attributed to lack of experience to treat medically compromised patients in general and specially MS patients during training years. Therefore, it crucial to improve dental training regarding treating medically comprised patients including MS patients.

Academic lectures should be the primary source of knowledge for dental students regarding different medical conditions. In the current study, more than 60% of the students reported that academic lectures are their primary source of knowledge about MS.

Overall, the results of this study indicate dental students at Umm alQura university are provided with adequate knowledge regarding MS including overall knowledge, orofacial manifestation and dental management . However, additional clinical training is required for dental students to gain the confidence to treat MS patients.

Limitation of the study:

Limitation of the study includes, the reliance on self-reported data may introduce social desirability bias, where students report what they believe is expected rather than their true understanding and confidence levels. Furthermore, the study does not account for variations in clinical exposure to medically compromised patients, such as those with multiple sclerosis, which could directly influence students' confidence in managing these cases. These limitations indicate areas for future research, including expanding to multiple institutions , employing longitudinal designs, and incorporating qualitative methods to provide a more comprehensive view of dental students' preparedness to manage patients with MS .

CONCLUSION AND RECOMMENDATION

In conclusion, it appears that dental students at Umm Al-Qura university dental school have sufficient knowledge regarding MS and its dental management. However, this knowledge does not seem to affect their level of confidence regarding treating MS patients. Thus, it is recommended to increase clinical training for dental students treating medically compromised patients specifically MS patients to give them more confidence to treat such patients during clinical practice.

FINAL STATEMENT

This study shows the importance of sufficient clinical training for dental students in treating medically comprised patents specifically MS patients.

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DECLARATIONS

Conflict of interest: The authors have no relevant financial or non-financial interests to disclose. The authors declare no conflict of interest.

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