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ORIGINAL ARTICLE

Learning styles of dental students



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KEYWORDS

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Abstract *Aims:* This study was conducted to determine the learning styles of dental students at King Saud University.

Methods and material: The Arabic version of the VARK questionnaire was administered to undergraduate dental male students in first, second, third, fourth and fifth years to determine their learning style preferences. Descriptive statistics were used to identify the learning styles of students.

Results: There were more students who preferred a multimodal learning style (58.4%) than those who preferred a unimodal learning style (41.6%). The quadmodal learning style was the preferred style among multimodal learners in total sample and in each year separately. Of the unimodal learners, 35.1%, 35.1%, 18.1%, and 11.7% of the students were Kinesthetic (K), Aural (A), Visual (V), and Reading/Writing (R) learners, respectively.

Conclusions: 58.4% and 41.6% of the students were found to have multimodal learning preferences and unimodal learning styles, respectively. The distribution of students' learning styles reflects strong kinesthetic and aural preferences. The learning preference does not differ between undergraduate male students from first to final years at College of Dentistry, King Saud University.

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1. Introduction

Stewart and Felicetti¹ define learning styles as those educational conditions under which a student is most likely to learn. Efficient transfer of information from the teacher to the student can be complicated by mismatches between teaching strategy and students' learning styles. Further, Kaplan and

Kies² pointed out that learning style is one of the sources of differences in the student's performance. Therefore it is important that dental educators need to understand how students learn and use the appropriate teaching methods in order to improve the quality of learning experience and to match students' preferences.

There are several methods available to measure learning styles. One of the most frequently used methods is VARK questionnaire developed by Neil Fleming.³ He described four sensory modalities: Visual (V), Aural (A), Reading/Writing (R) and Kinesthetic (K), (VARK). Visual learners learn through seeing pictures, graphs, videos, and graphics. Aural learners learn by listening to lectures, discussions, and speaking. Reading/Writing learners learn through reading the text and making their own notes whereas kinesthetic learners learn

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through touching and experiences that emphasize doing, physical involvement, and manipulation of objects.⁴

Students' learning styles can be affected by several factors such as gender, age, academic achievement, and culture.⁵ Few studies have been conducted to investigate learning preferences of dental students in Saudi Arabia. ALQahtani and Al-Gahtani⁶ found that the Diverging learning style was the dominant style among Saudi dental students and interns based on Kolb's Learning Style Inventory. While the students preferred the Assimilating style during their early preclinical years, they preferred the Diverging style during their later clinical years. On the other hand, Al-Saud⁷ used VARK questionnaire to determine the preferred mode of learning among Saudi first-year dental students. She reported that more than half of the students were found to have multimodal learning preferences. The most common single learning preferences were aural (20%) followed by kinesthetic (15.2%). The purpose of this descriptive study was to provide further information about the learning styles of undergraduate dental students, from first to final years, in male campus at King Saud University using the Arabic version of the VARK questionnaire.

2. Subjects and methods

The current study was conducted at King Saud University, Saudi Arabia in 2012. The Arabic version of the VARK questionnaire was administered to dental undergraduate students in male campus from first, second, third, fourth and fifth years to determine their learning style preferences. The study was reviewed and approved by the Research Centre at College of Dentistry (CDRC), King Saud University.

Each year representative was contacted via email and asked to distribute a link for survey to their colleagues. Students can choose more than one option for identifying the preferences for multiple learning styles. The survey results from each student were collected anonymously on SurveyMonkey (www.surveymonkey.com).

The distributions of the VARK preferences were calculated according to the guidelines given in the VARK website.⁸ To determine the percentage of students for each VARK modality (V, A, R, and K) and for all possible combinations of modalities (e.g., VA, VRK, etc.), the number of students who preferred each learning style modality was divided by the total number of students.

3. Results

Among the 350 students, 269 students completed the questionnaire. This represents a response rate of 76.85%. The distribution of students was 17 (6.3%) first year students, 68 (25.3%) second year students, 42 (15.6%) third year students, 89 (33.1%) fourth year students, and 53 (19.7%) fifth year students.

Fig. 1 shows the prevalence of the different learning preferences. The dominant learning preference among dental students was VARK learning preference (22.7%), followed by A and K as single learning preferences (14.5% for each). This was followed by a combination of V, A, and K learning preference (8.6%).

On the basis of the present study, 58.4% and 41.6% of the students preferred multimodal learning and unimodal learning

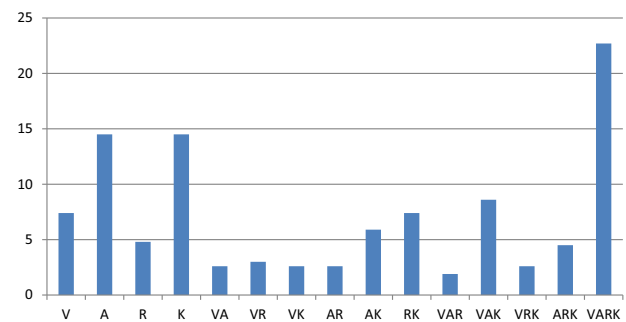


Figure 1 Prevalence of different learning styles.

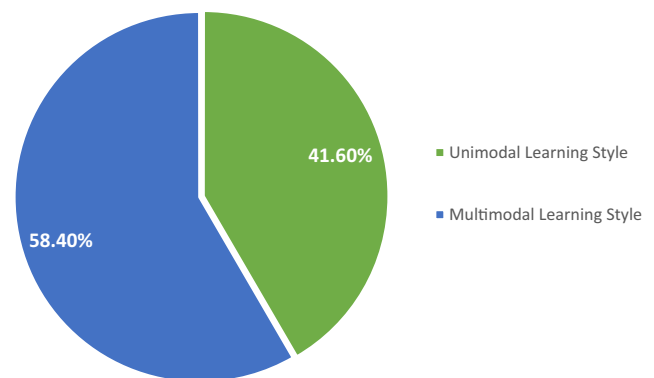


Figure 2 Distribution of unimodal and multimodal learning styles.

styles, respectively (Fig. 2). Of the students who preferred a multimodal learning style, 31.2%, 30.6% and 38.2% were bimodal, trimodal and quadmodal, respectively (Fig. 3). This indicates that quadmodal was the preferred style among multimodal students. Of the unimodal learners, 35.1% of the students preferred K, 35.1% of the students preferred A, 18.1% of the students preferred V, and 11.7% of the students preferred R (Fig. 4). Thus, the kinesthetic and aural learning preferences were dominant among unimodal students.

A further analysis showed that the dominant learning preferences of the bimodal students were AK preference (32%)

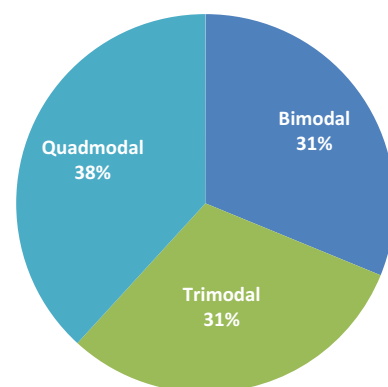


Figure 3 Distribution of multimodal learning styles.

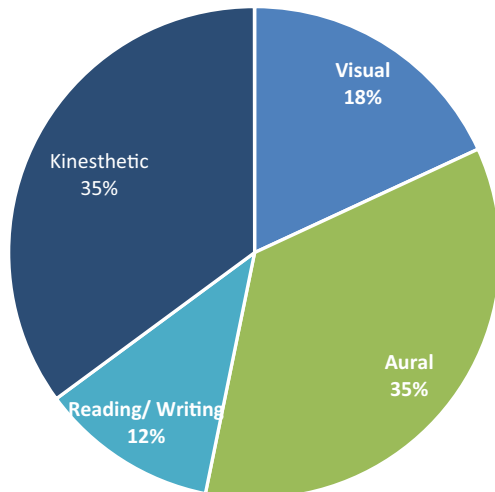


Figure 4 Distribution of unimodal learning styles.

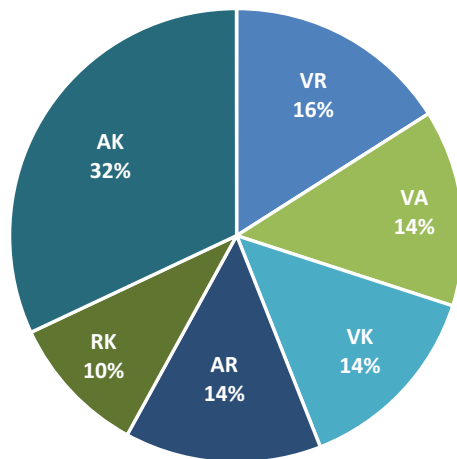


Figure 5 Distribution of bimodal learning styles.

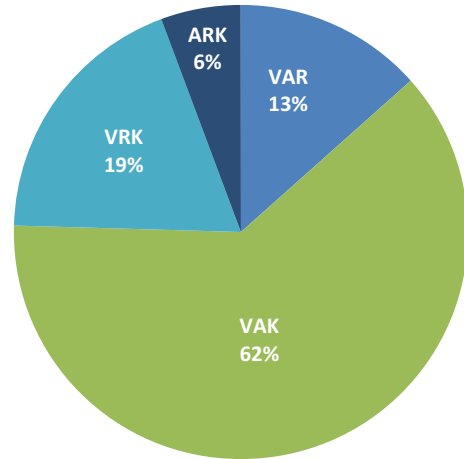


Figure 6 Distribution of trimodal learning styles.

followed by VR (16%), AR, VA, VK (14% for each) and VK (10%) preferences (Fig. 5). Of the students who preferred a trimodal learning style, 49% of the students were VAK, 25.5% of the students were ARK, 14.9% of the students were VRK, and 10.6% of the students were VAR (Fig. 6).

Regarding students' preference among each year separately, the prevalence of multimodal learning style was higher than that of unimodal learning style in each year (Fig. 7). The prevalence of bimodal learning style from first to fifth years was 11.8%, 13.2%, 26.2%, 16.9%, 22.6%, respectively. While the prevalence of trimodal learning style from first to fifth years was 5.9%, 20.6%, 23.8%, 15.7%, 17%, respectively. The prevalence of quadmodal learning style from first to fifth years were 41.2%, 22.1%, 19%, 20.2%, and 22.6%, respectively. The quadmodal style was the highest prevalent among multimodal students in each year except in third year in which the bimodal was the most frequent learning style. Fig. 8 shows that the dominant learning preference among dental students in each year was also VARK learning preference, followed by A and K as single learning preferences.

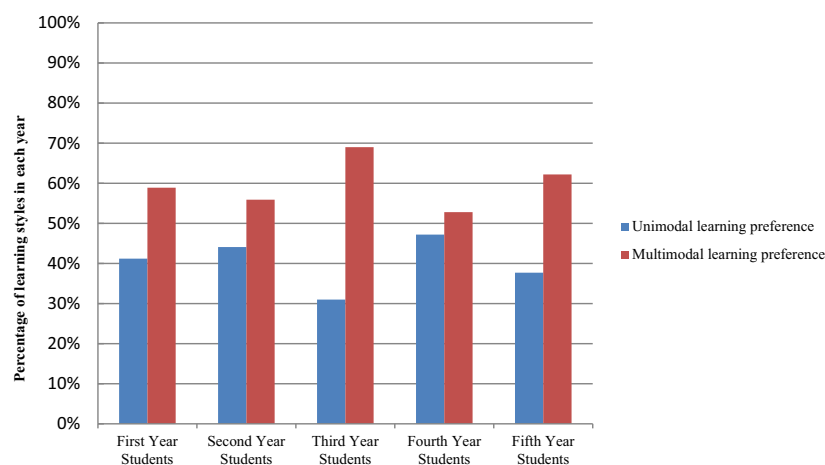


Figure 7 Distribution of unimodal and multimodal learning styles among first, second, third, fourth, and fifth year students.

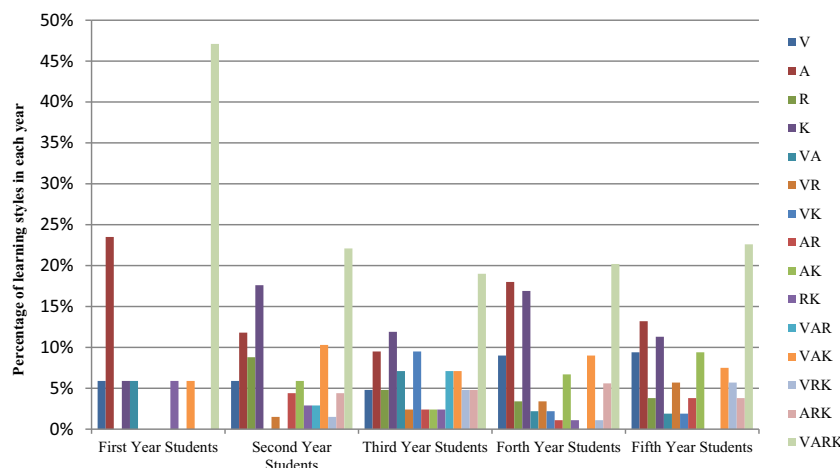


Figure 8 Prevalence of different learning styles among first, second, third, fourth, and fifth year students.

4. Discussion

The current study revealed that the learning preference does not differ between undergraduate male students from first to final years at College of Dentistry, King Saud University. This is in line with the findings of Samarakoon et al.⁹ who reported that no differences in learning preferences were observed in undergraduate students from first year to final year at University of Colombo. Regarding the learning styles of the total sample in this study, the results showed that 58.4% and 41.6% of the students preferred a multimodal learning and unimodal learning styles, respectively. Al-Saud⁷ investigated the learning style preferences of a group of first-year dental students at King Saud University. She reported similar results with the multimodal preference being the predominant style (59%). These findings are compatible with data reported for the learners included in the VARK website database which indicates that the ratio of unimodal to multimodal preference has been stated as 42:58.¹⁰ Additionally, the high prevalence of multimodal preference was also reported for students from American dental schools in the studies by Murphy et al.¹⁰ and El Tantawi,¹¹ of whom 56% and 73.7% have multimodal learning preferences, respectively. On the other hand, the majority of the Pakistani dental students prefer single learning style.^{12,13} The results of the present study showed that dental students have strong kinesthetic and aural learning preferences which are similar to findings among first-year Saudi dental students reported by Al-Saud.⁷ In addition, this finding is in agreement with the results obtained by El Tantawi,¹¹ Siddiqi et al.,¹² and Haq et al.¹³ By contrast, Murphy et al.¹⁰ found that kinesthetic and aural preferences were less frequent compared to read/write and visual preferences. Differences in the prevalence of learning preferences between these studies may be explained by the differences in age, gender, culture, and academic level of the students participated in these studies.

On the basis of the present study, the needs of most dental students would be satisfied through preclinical laboratory simulation or clinical instruction, case studies, listening to lectures, and exploring material through discussions and verbal explanations, which applied to a great extent in the last 3 years of educational curriculum at King Saud University and most

of dental schools. However, Hughes et al.¹⁴ pointed out that teaching methods matching a wide range of learning styles appear to be more effective than attempting to tailor the course content to the individual student. Further, Suskie¹⁵ suggested that educators should alter their teaching methods to give students an opportunity to learn in an environment more conducive to their preferences. On the other hand, the VARK learning profile allows student to acknowledge his/her learning preference and relate it with his/her learning process and difficulties.³ Dobson¹⁶ mentioned that students who understand their own learning style preferences can organize course information into the style that they most prefer.

There are several methods available to measure learning styles. One of the most frequently used methods is VARK questionnaire developed by Neil Fleming.³ It is characterized by simplicity and availability online in different languages. Satisfactory levels of reliability and validity of the VARK have been reported.¹⁷ However, VARK is not a complete learning style inventory but rather provides basic sensory learning preferences.¹² Fleming and Mills³ stated that “our attention turned away from inventories. We sought, instead, a simple technique that would promote reflection on sensory modality and would be characterized by its brevity, simplicity, and ability to encourage students to describe their behaviour in a manner they could identify with and accept”.³ Further, Suskie¹⁵ recommended that VARK or other learning style tests should not be used as the sole source of information for improving learning process.

5. Conclusion

Students' learning preferences remain unchanged over the five years of undergraduate study at College of Dentistry, King Saud University. 58.4% and 41.6% of the students preferred multimodal learning and unimodal learning styles, respectively. The students showed strong kinesthetic and aural preferences. However, faculty should understand the diversity of students' learning styles and use a wide range of teaching methods to improve the quality of the learning experience and to match varied learning styles. In addition, students should utilize the VARK questionnaire to understand their learning behaviours and relate it with their learning difficulties.

6. Recommendation

Although the objectives of the present study were achieved, further work is needed on a large representative sample, considering both genders and other confounding factors such as socioeconomic status, from different dental colleges across Saudi Arabia to represent the population of dental students.

Conflict of interest

The authors have no conflict of interest to declare.

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