

# Undergraduate Students' Experience of Dental Education Programs across Saudi Arabia: An Exploratory Study

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## Abstract

**Background:** Students' satisfaction surveys are valuable tools for assessing and improving the quality of education being imparted. Limited data are available from Saudi Arabia regarding students experience at halfway through an undergraduate dental program.

**Objective:** To determine students' perception of their halfway experience on various attributes of the quality of dental education programs in public dental schools across Saudi Arabia.

**Methods:** This exploratory study included all students from four major public universities who had completed their third year of undergraduate dental education during the academic year 2022–23. A previously validated, self-administered, 23-item Students Experience Survey was modified and used to collect data regarding the following five factors: course characteristics, infrastructure and facilities, learning resources, instructor characteristics, and program efficacy.

**Results:** The questionnaire was administered to 296 students, of which 252 (85.1%) responded. Overall, 84% of the students had a positive experience regarding the quality of the dental education programs. Females reported significantly higher positive experiences than males (mean score: 4.36 vs. 4.21, respectively;  $P = 0.042$ ). Course characteristics ( $P = 0.041$ ), instructors' characteristics ( $P = 0.002$ ), and program efficacy ( $P = 0.009$ ) were significant predictors of students' overall experience.

**Conclusion:** This study found that the majority of students had a positive halfway experience with the quality of dental education programs offered in Saudi Arabia. The significant predictors of satisfaction identified in this study can be useful for policymakers to further improve satisfaction levels.

**Keywords:** Dental education, dental student, experience, Saudi Arabia, survey, undergraduate students

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## INTRODUCTION

Student satisfaction surveys are important tools for assessing the quality of education and enhancing its delivery, as students are the most important stakeholders in educational programs, including in dentistry.<sup>[1,2]</sup> In Saudi

Arabia, institutions and programs are accredited by the national accreditation body, National Center for Academic Accreditation and Assessment (NCAAA). Accordingly, all schools, including dental, are required to obtain students' evaluation of the program through surveys to be able

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to obtain and maintain NCAAA accreditation.<sup>[3]</sup> The extent to which students' experiences encounter their anticipations indicates their satisfaction.<sup>[2]</sup> Administering the student satisfaction surveys as halfway through an undergraduate program could provide timely information to policymakers regarding the quality of education, thereby allowing implementation of appropriate strategies for the remaining program duration by improving the teaching and learning aspects, such as quality of teaching, curriculum design, and students' achievement of learning outcomes.

Several studies from Saudi Arabia have used student satisfaction surveys to determine the program's quality, curriculum, teaching skills, and educational environment in dental schools, but several have included single universities, and thus have limited generalizability.<sup>[2,3,9]</sup> Therefore, to fill this gap in the literature, the current study was conducted across several dental schools in Saudi Arabia to determine (i) students' perception of their halfway experience about the quality of dental education programs, (ii) differences in perception based on gender and dental school, and (iii) predictors of the overall halfway experience.

## METHODS

### Study design, setting, and participants

This exploratory study was conducted during the 2022–23 academic year (in March 2023) and included dental students at the end of the third year of their undergraduate program offered at four public dental schools across Saudi Arabia; the chosen students were halfway through the dental program and had completed the preclinical stage and started their clinical practice. In Saudi Arabia, there are 12 public dental schools; the four public dental schools were chosen based on the main characteristics described in Table 1. The chosen public dental schools were from the following universities: Al Jouf University (JU), Imam Abdulrahman Bin Faisal University (IAU), King Abdulaziz University (KAU), and King Saud University (KSU). These four universities are also major public universities of the Central, Western, Northern, and Eastern Provinces of Saudi Arabia. The distribution of third-year students ( $N = 296$ ) in those schools was as follows: JU, 45; IAU, 55; KAU, 90; and KSU, 106. Considering the finite population size, confidence level (95%), and margin of error (5%), the sample size was estimated as 287.

Ethical approval for this study was obtained from the Institutional Review Board of Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia.

**Table 1: Main characteristics of the selected public dental schools**

- Having male and female students
- Having similar learning outcomes and course matrix distribution for the undergraduate dental programs offered
- Dental students have exposure to clinical practice at the beginning of the third year
- Dental schools with full national and institutional accreditation status
- Quality of the programs that meet the NCAAA standards (2018)
- Comparable infrastructure, as required by the Ministry of Education to conduct the undergraduate dental education programs offered at public universities

NCAAA – National Center for Academic Accreditation and Assessment

### Questionnaire and data collection

Data were collected using a modified version of the Student Experience Survey (SES), a validated self-administered questionnaire.<sup>[5,6]</sup> The questionnaire was in English and consisted of two sections. Section I elicited demographic information (7 items). Section II comprised five dimensions (factors), with 23 items and one overall item (overall halfway experience). The five dimensions were course characteristics (5 items), infrastructure and facilities (4 items), learning resources (4 items), instructor characteristics (6 items), and program efficacy (4 items). All items were scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree); higher scores indicated higher levels of satisfaction.

The questionnaire was disseminated to the target students ( $N = 296$ ) through QuestionPro, an online survey tool. The details of students were obtained from the authorities of the selected dental schools and the questionnaire link was sent to their emails. The questionnaire included a description explaining the study objectives and the expected time for completing the survey and assured the participants of data confidentiality and anonymity. The target students were also informed that their participation was voluntary, that they could withdraw from the study at any point, and that the gathered data would only be used for the purpose of the study. All students were required to provide an informed consent before responding to the questionnaire. Students were provided 2 weeks to complete the questionnaire, and frequent reminders were sent during this period. The questionnaire was required to be fully completed to allow submission. IP checks were done to ensure there were no duplicate responses.

Concerning the reliability and validity of the questionnaire, the overall Cronbach  $\alpha$  of SES is 0.907, indicating that the variables evaluating the notion of the questionnaire are "Excellent."<sup>[10]</sup> The Cronbach  $\alpha$  value of SES dimensions, namely, course characteristics, infrastructure and facilities, learning resources, instructor characteristics, and program

efficacy, were 0.800, 0.806, 0.811, 0.861, and 0.893, respectively. Moreover, a confirmatory factor analysis with the varimax rotation method pronounced 69.701% of the variance in students' experience with the quality of dental education programs offered at Saudi dental schools. In addition, the following performance rating scale was used to define the mean values of students' responses on each dimension:<sup>[11,12]</sup> >3.6, high quality; 2.6–3.6, acceptable; and <2.6, improvement required. Similarly, the cumulative percentage of those who selected either “Agree” or “Strongly agree” on all SES items were explicated as follows: >80%, High quality; 60%–80%, Acceptable; and <60%, Improvement required.

### Statistical analysis

The data were analyzed using SPSS version 20 at a 5% level of significance. Descriptive statistics were applied to describe the extent of students' perception of their halfway experience with various attributes of the quality of dental education programs. An independent *t* test was performed to compare the students' overall halfway experience with the quality of the dental education programs in terms of gender. A one-way ANOVA was done to examine the students' perception of the SES dimensions and their overall halfway experience with the quality of dental education programs in terms of dental schools. Multiple regression analysis assessed various factors predicting the students' overall halfway experience.

## RESULTS

Of the 296 students to whom the questionnaire was distributed, 252 (85.1%) completed the questionnaire. Most of the respondents were female (154; 61.1%), and all were Saudis. The university-wise distribution of the respondents is presented in Table 2.

The overall mean value of the five dimensions was >3.6, which indicated “High quality.” For the individual five dimensions, the mean value ranged from 3.49 to 4.46. The highest cumulative percentage score was for students perceiving their acquired knowledge and skills to be valuable for their future careers (92%). The lowest cumulative percentage score was reported for the support provided by library staff when assistance was required (61%). Of the 23 items, 13 were perceived as “High quality” (i.e., the cumulative percentage of >80%), and the other items were found as “Acceptable” (i.e., the cumulative percentage between 60% and 80%). Besides, the overall item presented a mean value of 4.30 (i.e., “High quality”), and 84% of students had a positive experience with their dental education program [Table 3].

**Table 2: Distribution of respondents**

Dental schools	Frequency of respondents		Total, n (%)
	Male	Female	
JU	16	19	35 (13.9)
IAU	18	32	50 (19.8)
KAU	29	45	74 (29.4)
KSU	35	58	93 (36.9)
Total			252

JU – Al Jouf University; IAU – Imam Abdulrahman Bin Faisal University; KAU – King Abdulaziz University; KSU – King Saud University

### Dental school-related variance in perception on the five dimensions

When dental school was considered as the source of variance, one-way ANOVA revealed a significant difference in the students' perception of their halfway experience with course characteristics ( $P = 0.002$ ), instructor characteristics ( $P = 0.006$ ), and program efficacy ( $P = 0.001$ ), but not with infrastructure and facilities and learning resources [Table 4].

### Gender- and dental school-related differences

There was a significant gender difference in the dental students' overall halfway experience, with female students (mean: 4.36) having a more positive experience with the quality of dental education programs than males (mean: 4.21) [Table 5]. In terms of dental school, KSU had the highest overall mean score (4.35), followed by KAU (4.27), IAU (4.26), and JU (4.23). There was a significant difference in the student's overall halfway experience concerning their dental schools ( $P < 0.05$ ) [Table 6].

### Predictors of the overall halfway experience

The regression model observed in the multiple regression analysis was significant ( $P < 0.05$ ). Course characteristics ( $P = 0.041$ ), instructors' characteristics ( $P = 0.002$ ), and program efficacy ( $P = 0.009$ ) were the SES dimensions that were significant predictors of students' overall halfway experience with the quality of dental education programs offered at the chosen dental schools [Table 7].

## DISCUSSION

In this study, third-year dental students from four public universities across Saudi Arabia graded all SES dimensions as “High quality”. In addition, the overall halfway experience with the quality of dental education programs was rated as “High quality.” The cumulative percentage of 10 items under the five dimensions of SES was categorized as “Acceptable,” and the remaining 13 items were graded as “High quality.” In contrast, a previous study conducted on the overall experience of 7<sup>th</sup> semester students with their dental program offered at a single public university in Saudi Arabia using SES found that the mean score of 10

**Table 3: Characteristics of the overall and five dimensions of students hallway experience**

Items	Mean±SD	Cumulative (%)
Course characteristics (3.90±0.975)		
It was easy to find information about my university and its colleges before I enrolled here for the first time	3.80±1.270	74
When I first started at my college/university, the orientation week for new students was helpful to me	3.79±1.370	69
The procedures for enrolling in courses are simple and well-organized	3.81±1.186	83
My course is well-structured and appropriately delivered to attain all the learning outcomes	3.95±0.952	81
My courses and assignments boost me to explore new ideas and express my own opinions	3.94±1.128	80
Infrastructure and facilities (3.92±0.811)		
Classrooms (including lecture rooms, laboratories, etc.) are attractive and comfortable	3.69±1.108	82
Student computing facilities are adequate for my needs	3.70±1.072	72
There are adequate facilities for extracurricular events (including recreational and sporting activities)	3.50±1.024	63
Adequate facilities are available at my college/university for religious observances	4.39±0.893	75
Learning resources (3.76±0.847)		
The library is open at convenient times	3.68±1.062	80
I am satisfied with the quality and extent of library resources available to me	3.71±1.030	84
I am satisfied with the library facilities (i.e., study facilities, AV aids, photocopying facilities, etc.) prevailing in my college/university	3.69±1.074	81
The library staff is supportive to me when I require assistance	3.49±1.301	61
Instructor characteristics (4.15±0.868)		
My instructors are fair in treating their students	4.12±1.048	85
The instructors conducted the course consistent with the course outline	4.14±1.043	83
The class atmosphere was welcoming and friendly	3.73±1.227	64
Most faculty with whom I work at my college/university are truly concerned about my progress	4.13±1.024	78
There is enough opportunity at college/university to obtain advice on my studies and future career	4.08±1.046	73
I am satisfied with the teaching skills of my instructors	4.07±1.017	81
Program efficacy (4.05±0.777)		
My program is stimulating my interest in further learning	3.94±1.050	84
My program is increasing my ability to investigate and solve new and unusual problems	3.72±0.899	81
The knowledge and skills that I am learning will be valuable for my future career	4.46±0.693	92
I am learning to work effectively in group activities	3.51±0.976	62
Overall experience		
Overall, I am enjoying my life as a student at my college/university	4.30±0.765	84

SD – Standard deviation

**Table 4: Variation in students' perception of their halfway experience on students experience survey dimensions concerning their dental schools**

Source of variance	Dimensions	Sum of squares	Mean square	P
Dental schools	Course characteristics	9.002	3.001	0.002*
	Infrastructure and facilities	9.647	3.216	0.301
	Learning resources	24.337	5.389	0.065
	Instructor characteristics	9.331	3.110	0.006*
	Program efficacy	8.752	2.853	0.001*

\*Significant at 0.05 level. SES – Students experience survey

of 20 items was graded as “Acceptable”, and the remaining as “Improvement required;” no items were rated as “High quality.” The cumulative percentage of all 20 SES items were rated as “Improvement required.”<sup>[5]</sup> In another Saudi Arabia-based study that evaluated the final-year students' opinions about the quality of dental program across various dental schools using the Program Evaluation Survey, faculty-, institutional-, and program-related aspects were rated as “High quality.” Overall, the students were highly satisfied with the program offered at their dental schools, with 21 items being reported as “Acceptable,” which was also the cumulative percentage value.<sup>[11]</sup> However, this observation concerning the cumulative percentage varied from the present study due to the difference in the population type covered and their perceptions.

This study revealed that dental school-related differences in course characteristics were a significant variable influencing the students' perception of their halfway experience. This may be due to each dental school having differences in the visibility of its information for beginners and the extent of conducting orientation programs for new students, factors that are useful for students to have a better comprehension of dental curriculum-related demands and create an informal association with the instructors and their peers.<sup>[13]</sup> Another factor that can affect students' perception of course characteristics is workload due to assignments and its feedback.<sup>[14]</sup>

Instructors' characteristics was another factor influencing students' overall halfway experience. It is known that the quality of students' experience in education is associated with the motivation and talents of their faculty members.<sup>[4]</sup> Therefore, the inimitable qualities and attributes of instructors can result in differences in student experiences despite the use of standardized teaching and learning strategies and assessment methods. A previous study from Saudi Arabia found that the second to sixth-year students perceived their dental instructor's performance qualities to be significantly more important than personality qualities for active learning.<sup>[4]</sup> Another study found that

Saudi dental students perceived the characteristics of ethics, honesty, and integrity as well as the provision of learning materials and giving respect and care as the most critical attributes of active instructors in dental education.<sup>[15]</sup> Interestingly, a recent study in a Spanish university found that fourth- and fifth-year dental students had a neutral perception of their professors' performance, indicating the co-existence of positive and negative facets in the teaching-learning process.<sup>[16]</sup>

Program efficacy across dental schools significantly influenced students' perception of their halfway experience across the included dental schools. Adhering to the NCAAA standards, Saudi dental schools focus on their program learning outcomes in line with the national qualifications' framework, academic standards, and labor market needs. Despite this, the differences noted in the current study are likely because of disparity in the self-confidence and self-efficacy gained from the program, as they were halfway through their dental program, and the dental curriculum and course delivery differing in nature across the selected dental schools. In contrast, a study from single universities in Denmark and Netherlands with standardized dental programs found no difference in the self-efficacy of final-year students based on university.<sup>[17]</sup> This disparity in the findings with the present

study may be due to differences in the study year of the participants. A previous study from one of the dental schools included in this study, namely IAU, found that among all-year dental students found low level of satisfaction regarding the dental curriculum enhancing their problem-solving skills and critical thinking, and providing evidence-based learning, thereby indicating the areas of improvement.<sup>[8]</sup> Accordingly, dental schools must prepare their graduates with adequate knowledge and skills to practice proficiently, empathetically, and individually, devoid of supervision. Notably, there may be a variation among the schools in achieving this necessity about the anticipations of governing forms and encounters within the teaching background.<sup>[18]</sup>

The current study found that two factors, namely, infrastructure and facilities and learning resources within dental schools, were not significant predictors of differences in students' perception of their halfway experience. This is likely due to achieved uniformity in both these areas through rules and regulations of the Ministry of Education (MoE), Saudi Arabia, and the NCAAA accreditation requiring that the learning resources, facilities, and equipment in a dental school must adequately meet the needs of the program and its courses. Finally, the MoE provides access to electronic journals, publications, and e-books in various scientific areas through its Saudi Arabian Digital Library to students, instructors, and researchers of universities in Saudi Arabia.<sup>[19]</sup>

This study also found that female dental students had a significantly more positive experience than males. This may be due to gender-specific discrepancy in students overall experience, as gender is a crucial component with a biasing effect on the student's scores.<sup>[20,21]</sup> Gender-stereotyped attitudes can impact the conduct and evaluation of oneself and others.<sup>[22]</sup> Furthermore, unconscious stereotypes and judgments may influence females' experience during dental education and while applying for jobs and submitting articles for publication.<sup>[23]</sup> Notably, although Saudi universities enroll students of both genders, they have different campuses.<sup>[3]</sup> In line with this outcome, a recent study in Saudi Arabia measured second-, third-, and

**Table 5: Gender differences in students overall halfway experience with the quality of the dental education programs**

Variable	Gender	n (%)	Mean±SD	P
Student's overall experience	Male	98 (38.9)	4.21±0.790	0.042*
	Female	154 (61.1)	4.36±0.747	

\*Significant at 0.05 level. SD – Standard deviation

**Table 6: Variation in student's overall halfway experience with the quality of the dental education programs concerning their dental schools**

Variable	Source of variance Dental schools	Mean±SD	Sum of squares	Mean square	P
Student's overall experience	JU	4.23±0.789	7.03	2.304	0.031*
	IAU	4.26±0.828			
	KAU	4.27±0.764			
	KSU	4.35±0.732			

\*Significant at 0.05 level. SD – Standard deviation; JU – Al Jouf University; IAU – Imam Abdulrahman Bin Faisal University; KAU – King Abdulaziz University; KSU – King Saud University

**Table 7: Factors predicting student's overall halfway experience with the quality of dental education programs**

Dimensions	Unstandardized coefficients		Standardized coefficients	t	P	Collinearity statistics	
	β	SE	β			Tolerance	VIF
Constant	2.954	0.311		9.487	0.000*		
Course characteristics	0.135	0.055	0.194	2.026	0.041*	0.315	3.220
Infrastructure and facilities	0.227	0.089	0.248	2.551	0.095	0.349	2.867
Learning resources	0.142	0.068	0.208	2.084	0.062	0.331	3.023
Instructor characteristics	0.334	0.125	0.316	4.460	0.002*	0.425	2.011
Program efficacy	0.283	0.097	0.291	3.013	0.009*	0.361	2.305

\*Significant at 0.05 level. SE – Standard error; VIF – Variance inflation factor

fourth-year dental students' perception of the educational environment. It revealed that female dental students had higher mean DREEM scores than their counterparts. Such observations in females were associated with instructors, teaching strategies, and their social lives in dental schools.<sup>[24]</sup> Contrarily, previous studies in Saudi Arabia stated that there was no significant difference in the mean domain and total DREEM values among dental students concerning their gender.<sup>[7,25,26]</sup> These studies were single institution based and included all-year or second- to sixth-year dental students; however, this study only included third-year students of four dental schools in Saudi Arabia.

The current study noted a significant difference in the students' overall halfway experience with the quality of dental education programs concerning their dental schools. This observation might be because dental schools may differ in course delivery, students' self-efficacy, and instructors' traits. Further, different dental schools may have different faculty and student compositions, influencing students' perceptions.<sup>[27]</sup> Notably, the current study has only focused on the dental students' halfway experience of their program, which might also influence the outcomes. A recent study from Syria also found that students' perception of the quality of the learning environment significantly varied across their public dental schools.<sup>[28]</sup> However, it included all-year students of the dental program and measured their perceptions using the DREEM inventory.

Course characteristics, instructors' characteristics, and program efficacy were also significant predictors of students' overall halfway experience with the quality of dental education programs offered at Saudi dental schools. In accord with this finding, Xie *et al.*<sup>[29]</sup> observed that course materials, learning assessments, course production, and course activities significantly affect the students' online learning satisfaction. Further, instructors' characteristics, such as teaching and clinical skills, student–faculty interaction, and curriculum presentation, were crucial factors determining the students' perception of the active learning experience at a dental school.<sup>[30]</sup> A previous study revealed that e-learning self-efficacy significantly affected Saudi students' satisfaction with the e-learning experience.<sup>[31]</sup>

### Limitations

This study is restricted to the public schools of Saudi Arabia to understand the students' perception of their halfway experience with the quality of undergraduate dental programs. However, future research can also include private dental schools to provide a wider representation and allow a comparison between the public and private dental

schools. Further, the association between SES dimensions and dental students' overall halfway experience can also be assessed. The study also has the inherent limitations of an online survey, and future studies using qualitative interviews may provide additional information.

### CONCLUSION

This study found that the overall halfway experience of dental education at the four dental schools was positive (“High quality”). All the five SES dimensions studied were rated to be of “High quality.” In addition, a significant difference was found in the students' perception of their halfway experience with the course characteristics, instructors' characteristics, and program efficacy with regards to their dental schools. Overall, these three dimensions were also predictors of students' halfway experience of their dental program. Finally, female dental students had a significantly more positive experience than their male counterparts.

### Ethical considerations

The study was approved by the Institutional Review Board (Ref. no.: IRB-2023-02-128) of Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia. All study participants provided digital consent before participating in the study. The study adhered to the principles of the Declaration of Helsinki, 2013.

### Peer review

This article was peer-reviewed by three independent and anonymous reviewers.

### Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### Author contributions

A.A.K. was solely involved in the Conceptualization, Methodology, Data analysis, and Writing of the manuscript. The author has read and agreed to the published version of the manuscript.

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### Conflicts of interest

There are no conflicts of interest.

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