Original Article

The relationship between the quality of learning experiences and academic motivation among dental students

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Article info

Article history:
Received 24 Dec. 2024
Accepted 21 Aug. 2025
Published 13 Jul. 2025

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How to cite this article:
Yazdanifard A, Hajihassani N, Sefidi F, Shafagh S. The relationship between the quality of learning experiences and academic motivation among dental students. J Med Edu Dev. 2025; 18(2):89-96.
http://dx.doi.org/10.61882/edcj.18.2.105

Abstract

Background & Objective: Motivation and the quality of learning experiences are key factors influencing students' academic success and various behavioral aspects. The purpose of this study was to investigate the relationship between the quality of learning experiences and academic motivation and its correlation among dental students.

Materials & Methods: The present cross-sectional study involved 147 dental students enrolled in dental school. Data collection utilized a demographic information questionnaire, the Neumann Learning Experience Questionnaire, and the modified version of the Harter Academic Motivation Scale. Questionnaires were sent either via email or in written form. Statistical analysis was performed using SPSS 24.

Results: Most participants were female students (54.4%) with a mean age of 22.5 ± 2.8 years. Students' academic motivation and the quality of their learning experiences were generally positive. A significant and positive correlation was found between the quality of learning experiences and its various components with academic motivation ($p < 0.05$). The correlations ranged from 0.31 to 0.46 for internal motivation and 0.12 to 0.20 for external motivation. There was a significant difference in academic motivation ($p < 0.02$) and the quality of learning experiences ($p < 0.01$) by marital status. There were also significant and inverse correlations between academic motivation ($r = -0.24$; $p < 0.01$) and the quality of learning experiences ($r = -0.39$; $p < 0.01$) within the academic semester. There was also a significant association between academic motivation and Grade Point Average (GPA) ($p < 0.01$).

Conclusion: Our findings indicate that marital status and the semester are associated with motivation and the quality of learning among dental students. To boost academic motivation, we recommend enhancing learning resources, fostering stronger faculty-student relationships, and increasing curriculum flexibility. Additionally, promoting a supportive academic environment and conducting large-scale studies across other settings would help validate these findings and identify broader trends.

Keywords: motivation, education, students, dentistry, learning

Introduction

Several factors are associated with students' educational performance, including Grade Point Average (GPA), family support, gender, and accommodation arrangements [1, 2]. One of the effective factors is the quality of learning experiences, which can be affected by sources, curriculum content, curriculum flexibility, and the quality of teacher-student relationships [3]. Improving the quality of learning experiences leads to long and short-term success in various fields, such as occupational success [4].

Another factor affecting learning is motivation, which is considered a prerequisite for learning [5]. Motivation includes intrinsic and extrinsic motivations. Intrinsic motivation is when a person performs an activity solely to enjoy the work process regardless of external rewards. On the other hand, extrinsic motivation involves engaging in activities to attain external rewards or avoid punishment and is driven by factors such as praise, grades, or financial incentives [6]. Ryan and Desi also view engagement in learning activities and the effort to

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[DOI: 10.61882/edcj.18.2.105]

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complete those activities as closely related to academic motivation [7]. From another point of view, academic motivation is an internal force for comprehensive assessment of performance and efforts to succeed in performance [7]. Overall, academic motivation is one of the most important factors in the growth and development of educational systems [8]. Academic motivation affects the quality of learning experiences and can be effective in academic success [9].

The academic performance of medical students is one of the most important and objective criteria for evaluating the effectiveness of educational systems [10]. By exploring the correlation between the quality of learning experiences and academic motivation, as well as identifying the factors that influence each aspect, we can effectively enhance the goals of educational systems [11]. Previous studies evaluated the associations between the quality of learning experiences and motivation in different countries and settings [12-14]. However, while there is a body of research on this topic in Iran, limited studies have focused on dental students in specific universities. Given the important role that dental education plays in the country's health system, the need for research focused on this specific student population remains. The present study aims to evaluate the associations between the quality of learning experiences, academic motivation, and their associates among dental students. This study addresses an existing knowledge gap by focusing on dental students, a population not extensively studied in previous research. Moreover, this study provides insights that can inform improvements in dental education practices and policies within Iran and beyond.

Materials & Methods

Design and setting(s)

This cross-sectional study was conducted over one year, from March 15, 2021, to December 15, 2021, among dental students at Qazvin University of Medical Sciences in Qazvin, Iran. In total, 231 students were eligible to participate in the study, and all were included. Ultimately, 147 participants completed the questionnaires and were included in the final analysis. The response rate in this study was 63.6%, as 147 out of 231 eligible dental students completed the questionnaire.

Participants and sampling

A convenience sampling method was employed in this study. Although students are typically accessible within faculties, this approach was chosen to facilitate recruitment, particularly for students who might not have direct access to official communication channels. Additionally, this method helped increase the response rate. This study was utilized to maximize participation, particularly among students who might not have direct contact with the researchers. The survey link was disseminated exclusively through official university channels.

Furthermore, data were collected from students with diverse study years to enhance generalizability. The data was collected by sending questionnaires via a link or in written form. Students were provided with a link to complete the survey voluntarily and anonymously. This approach was selected to improve response rates and streamline data collection.

Tools/Instruments

The study utilized three questionnaires: 1) a demographic information questionnaire that included sex, marital status, age, GPA, and academic year of the students; 2) a learning experiences questionnaire; and 3) an academic motivation scale. The learning experiences questionnaire was originally developed by Neumann et al. and later modified by Naami et al. [15, 16].

Data collection methods

The Neumann Learning Experiences Questionnaire consists of 12 items divided into four fields: resources (3 items), curriculum content (3 items), curriculum flexibility (3 items), and the quality of formal and informal relationships between students and professors (3 items). It uses a 5-point Likert scale ranging from 1 (very poor) to 5 (excellent). The internal consistency of the four fields, as measured by Cronbach's alpha, was 0.86, 0.79, 0.85, and 0.82, respectively, in Naami et al.'s study [15].

The present study also calculated Cronbach's alpha values for all four dimensions. The validity of this questionnaire was previously assessed by Neumann and colleagues through correlations with academic attachment, satisfaction with university experiences, and academic performance, yielding significant correlations ranging from 0.35 to 0.67 [16].

The Academic Motivation Scale was originally developed by Harter [17] and modified by Lepper, Corpus, and Lyengar [18]. The Persian version of this questionnaire was translated and validated by Bahrani [19]. The scale consists of 33 items, with 17 assessing intrinsic motivation and 16 assessing extrinsic motivation. Each item is rated on a 6-point Likert scale

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ranging from 0 ("never") to 5 ("almost always"), where higher scores indicate a better status. The reliability of this questionnaire, evaluated using Cronbach's alpha, was found to be 0.85 for intrinsic motivation and 0.69 for extrinsic motivation [17].

Its validity was examined by correlating it with academic performance, and the internal consistency coefficients for all items ranged between 0.30 and 0.78. In the present study, reliability was reassessed using Cronbach's alpha (0.85) and split-half reliability (0.77) [19].

The overall score for this questionnaire varies from 33 to 165. Scores were categorized into three main levels: Good: Scores above 99 were considered "good," reflecting a highly positive learning experience or motivation assessment. Moderate: Scores between 66 and 99 were classified as "moderate," indicating a generally positive evaluation but with room for improvement in certain aspects. Poor: Scores between 33 and 66 were categorized as "poor," indicating an unfavorable or dissatisfied assessment of the learning experience or motivation in these areas [20].

Data analysis

The data were analyzed using the SPSS version 24 (SPSS Inc., IL, USA).

The normality of the data was assessed using the Kolmogorov-Smirnov test, and graphical methods such as histograms and Q-Q plots were also employed to examine the distribution. The Analysis Of Variance (ANOVA) and independent sample t-test were applied. Correlations between variables were assessed using the Pearson correlation and reported with Pearson correlation coefficients (r). The data are provided as mean ± Standard Deviation (SD) or frequency and percentages. A p-value of less than 0.05 was considered statistically significant.

Results

The demographic characteristics of 147 students are listed in **Table 1**.

The assessment of the quality of learning experiences and their components showed that the highest mean score was for sources (3.05 ± 0.83), while the lowest was for learning flexibility (2.91 ± 0.87). In determining the level of academic motivation and its components, the mean score of the external motivation was higher than the internal motivation (3.14 ± 0.32 vs. 3.02 ± 0.48), and good and moderate levels of motivation were reported in 51% and 49% of students, respectively (**Table 2**).

Table 1. Demographic and baseline characteristics of participants (n = 147)

Characteristic	n (%) or Mean ± SD
Gender	
Female **n (%)**	80 (54.4%)
Male **n (%)**	67 (45.6%)
Marital status	
Single **n (%)**	125 (85.0%)
Married	22 (15.0%)
Age (years) Mean ± SD	22.5 ± 2.8
Age group	
Under 21 **n (%)**	57 (38.8%)
21–24 **n (%)**	71 (48.3%)
Over 24 **n (%)**	19 (12.9%)
GPA (out of 20)	16.7 ± 1.1
Academic semester	
1st **n (%)**	6 (4.1%)
3rd **n (%)**	12 (8.2%)
4th **n (%)**	17 (11.6%)
5th **n (%)**	32 (21.8%)
6th **n (%)**	6 (4.1%)
7th **n (%)**	28 (19.0%)
9th **n (%)**	24 (16.2%)
11th **n (%)**	22 (15.0%)

Abbreviations: GPA, grade point average; SD, standard deviation; n, number of students; %, percentage of total participants.

Table 2. Mean scores of learning experiences and academic motivation (n = 147)

Component	Mean ± SD
Sources	3.05 ± 0.83
Learning flexibility	2.91 ± 0.87
Academic motivation - internal	3.02 ± 0.48
Academic motivation - external	3.14 ± 0.32

Abbreviations: SD, standard deviation; n, number of students.

There were mostly significant positive correlations between the quality of the learning experience and its components (i.e., sources, curriculum content, curriculum flexibility, and the quality of formal and informal relationships) and the academic motivation, as well as its components (i.e., internal and external motivations) ($p < 0.05$) Specifically, the correlations ranged from 0.31 to 0.46 for internal motivation and from 0.12 to 0.20 for external motivation (**Table 3**).

There was a significant association between academic motivation and the quality of learning experiences based on marital status. Married students had higher scores for academic motivation (3.31 ± 0.48 vs. 3.04 ± 0.26; $p < 0.02$) and quality of learning experiences (3.62 ± 0.76 vs. 2.83 ± 0.68; $p < 0.01$) compared to single students.

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Table 3. The correlations between the quality of learning experiences and its components and the academic motivation of dental students (n = 147)

Learning experience component	Academic motivation	Internal motivation	External motivation
Sources	0.31, p < 0.001	r = 0.33, p < 0.001	r = 0.12, p < 0.142
Curriculum content	0.46, p < 0.001	r = 0.47, p < 0.001	r = 0.20, p < 0.013
Curriculum flexibility	0.39, p < 0.001	r = 0.40, p < 0.001	r = 0.17, p < 0.039
Formal and informal relationships	0.36, p < 0.001	r = 0.35, p < 0.001	r = 0.19, p < 0.020
Overall quality of learning experiences	0.44, p < 0.001	r = 0.44, p < 0.001	r = 0.20, p < 0.013

Note: All correlations are statistically significant at p < 0.05.
Abbreviations: r, Pearson correlation coefficient; p, p-value (two-tailed); n, number of students

Additionally, a significant association was found between academic motivation and GPA (p < 0.004), with students having a GPA greater than 17 scoring the highest for academic motivation (3.04 ± 0.27) (**Table 4**). Furthermore, significant negative correlations were observed between the quality of learning experiences (r = -0.39; p < 0.01) and academic motivation (r = -0.24; p < 0.01) with an increase in the number of semesters (**Table 4**).

Table 4. The associations between the academic motivation and the quality of learning experiences with marital status, GPA, sex, and age among dental students

Variable	Group	Quality of learning experiences Mean ± SD	Sig.	Academic motivation Mean ± SD	Sig.
Marital status	Single	2.83 ± 0.68	t = -4.86	3.04 ± 0.26	t = -2.56
	Married	3.62 ± 0.76	p < 0.001	3.31 ± 0.48	p = 0.018
GPA (out of 20)	< 14	2.97 ± 0.55	F = 0.73	2.51 ± 0.14	F = 5.87
	14–17	3.00 ± 0.76		3.11 ± 0.33	
	> 17	2.83 ± 0.73	p = 0.485	3.04 ± 0.27	p = 0.004
Sex	Female	2.96 ± 0.78	t = 0.20	3.10 ± 0.35	t = 0.82
	Male	2.94 ± 0.70	p = 0.840	3.06 ± 0.28	p = 0.415
Age (years)	< 21	3.01 ± 0.72	F = 1.61	3.07 ± 0.32	F = 0.03
	21–24	2.85 ± 0.75		3.09 ± 0.34	
	> 24	3.16 ± 0.77	p = 0.203	3.08 ± 0.23	p = 0.970

Notes: Statistical tests used include the independent t-test for comparisons between two groups and one-way ANOVA (F-test) for comparisons between more than two groups. A p-value of < 0.05 was considered statistically significant.
Abbreviations: SD, standard deviation; GPA, grade point average; F, analysis of variance test; Sig, statistical significance; p, probability-value; t, independent t test.

Discussion

This study was conducted to determine the relationship between the quality of learning experiences and academic motivation among dental students. The findings showed that they mostly had good motivation. Marriage was associated with improved motivation and better learning experiences, while a higher GPA correlated with increased academic motivation. Conversely, as students progressed through their academic semesters, their motivation and quality of learning experiences tended to decline. Our findings showed that the participants had moderate or good status in terms of academic motivation.

These findings align with the results of Ghomi et al. [12] among students in faculties of health, nursing and midwifery, medicine, paramedical studies, dentistry, and traditional medicine, as well as with those of Naseh et al. [21] among medical students and Zaregar et al. among health school students [22]. However, it is important to acknowledge that some

international studies have reported different patterns of academic motivation among dental students. For instance, Khanagar et al. in Saudi Arabia found that many students exhibited moderate academic motivation, varying influences from demographic factors such as parental education level and academic year.

However, the study did not find a statistically significant relationship between academic motivation and self-esteem, suggesting that additional contextual factors might shape students' motivation in different settings [23].

Moreover, a study by Orsini et al. explored the quality of motivation and its impact on student's academic outcomes in dental schools,

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[DOI: 10.61882/edcj.18.2.105]

emphasizing that self-determined motivation (autonomous motivation) had a stronger positive association with vitality, self-esteem, and deep study strategies, contrasting with controlled motivation and motivation [24]. This highlights a critical distinction in the types of motivation and their influence on academic success.

In our study, the higher GPA observed in the sample may account for the moderate to good levels of academic motivation, as previous research has demonstrated a correlation between higher GPA and increased academic motivation. Furthermore, dental students tend to be motivated by factors such as status, security, and the nature of a dental career, which includes benefits like regular working hours, self-employment, independence, and financial gain [25]. Additionally, the score for extrinsic motivation was higher than that for intrinsic motivation. This aligns with the definition of extrinsic motivation, which is often driven by specific goals such as future career success or adequate income, reflecting findings from the study by Naseh and colleagues [21]. However, in line with the international literature, our results indicate a higher score for extrinsic motivation than intrinsic motivation. This trend was similarly observed in studies from China, where academic motivation varied based on the curriculum structure and specific student interests [26].

Regarding the quality of learning experiences, our findings were almost similar to the prior evidence [12, 27-29]. In our study, among the four components of the quality of learning experiences, the score for sources—such as the library and website—was the highest. This may be attributed to the reliance on these resources to complete various assignments and tasks at this stage. Our findings align with Ghomi et al. and Gholizadeh et al. [12, 29], showing a significant and positive relationship between the quality of learning experiences and academic motivation. This is reasonable, considering the factors that influence the quality of learning experiences, which have a relatively weak but still motivating impact on students' academic motivation. However, unlike our study, Ghomi et al. [12] found that only one component—the teacher-student relationship—did not have a significant and positive correlation with academic motivation. In contrast, all components in our study demonstrated significant and positive correlations. The weak relationship in our study may be attributed to various factors, such as individual student characteristics, educational competencies, and even cultural and environmental differences, which could have played a role in moderating the influence of learning experiences on academic motivation.

Consistent with the findings of studies by Ghomi et al. [12] and Zaregar et al. [22], we found no significant correlations between sex and academic motivations. However, the study by Naseh et al. indicated that girls had significantly higher academic motivation levels than boys [21]. Unlike previous generations, this difference could be attributed to girls' aspirations for employment, financial independence, and a desire to engage more actively in society through education. In another study involving dental and dental hygiene students in Japan, female students placed greater importance on making a societal impact through work in a fulfilling environment rather than solely focusing on financial gain, while male students aimed to balance professional fulfillment and income [30].

The results showed that married students had higher mean values of academic motivation and the quality of learning experiences. Although Kashfi et al.'s study did not find a significant relationship between marital status and academic motivation, the discrepancy may be attributed to differences in the academic fields of the students in these studies [31].

The evaluation of the correlation between the quality of learning experiences and academic motivation with academic semesters revealed a decrease in the mean scores of both variables as the academic semester increased. This decline may be due to some students entering the job market as they progress through their semesters, leading to fatigue from balancing academic and work pressures, which may cause GPAs to drop. This finding aligns with the study by Zaregar et al. on the relationship between academic motivation and academic semesters [22].

No significant relationship was observed between age and academic motivation in the study of the relationship between age and academic motivation, which was consistent with the results of some prior studies [31, 32]. However, this contrasts with the findings of Naseh et al., who concluded that the association was significant and inverse. This difference may be attributed to younger students' greater enthusiasm and motivation to engage in their studies [21].

We found no significant associations between age and the quality of learning experiences, consistent with several previous studies conducted in Iran [12, 27]. Additionally, no significant associations were observed between GPA and the quality of learning experiences. This lack of correlation may be attributed to all students

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[DOI: 10.61882/edcj.18.2.105]

benefiting equally from the five components of the quality of learning experiences. The greatest effect on the GPA was the student's motivation, similar to the study by Roshan Milan et al. [32]. Academic motivation generally leads learners to comprehensively evaluate their performance [22]. Since educational motivation is regarded as a key factor influencing students' activities, any effort to enhance motivation among students will be both effective and important. So, according to the mentioned materials, the need to improve students' quality of learning experiences should be placed at the top of educational affairs by educational institutions. Further studies are suggested with students of different fields and in different cities.

Further studies are suggested with students from different fields and in different cities. We categorized academic motivation into intrinsic and extrinsic motivations; however, several other domains, such as coping, environment, and self-efficacy, should also be considered for evaluation [33]. The strength of our study lies in using validated and reliable questionnaires to assess learning experiences and academic motivation, along with a robust data collection method through an online survey, enhanced the reliability and efficiency of the data-gathering process. Furthermore, convenience sampling helped increase the response rate, especially among students with limited access to official channels. However, the study also has several limitations. The cross-sectional design restricts the ability to establish causal relationships, and the reliance on self-reported data may introduce biases such as social desirability. Moreover, the study's generalizability is limited to dental students at a single university, and the response rate of 63.6% suggests potential non-response bias.

Conclusion

In summary, marriage was positively associated with enhanced motivation and learning experiences, while a higher GPA was also linked to increased academic motivation. Conversely, motivation and learning experiences declined as students progressed through their academic semesters. Although more than half of the participants demonstrated good motivation, applying various motivational theories and prioritizing student well-being is still recommended to enhance academic motivation further. Additionally, further large-scale multicenter observational studies should be conducted with students from other fields to identify the factors associated with motivation and learning experiences, aiming to improve performance and prevent burnout or other mental disorders. In addition, improving learning resources, faculty-student relationships, and increasing curriculum flexibility are recommended to increase academic motivation.

Ethical considerations

Written consent was obligatory for participation by the Declaration of Helsinki. The study was approved by the ethical committee of Qazvin University of Medical Sciences, Qazvin, Iran, with an ethical code of IR.QUMS.REC.1400.302.

Artificial intelligence utilization for article writing

No generative AI was used.

Acknowledgment

We highly appreciate the dentistry students who participated in this study.

Conflict of interest statement

The authors report no actual or potential conflict of interest.

Author contributions

NH and SS designed the study, while FS and AY analyzed the data and conducted the statistical analyses. NH, FS, SS, and AY drafted the initial manuscript. All authors critically edited and revised the manuscript's draft. Each author reviewed the drafted manuscript for critical content and approved the final version.

Funding

None.

Data availability statement

The data supporting this study's findings are available on request from the corresponding author. However, due to privacy or ethical restrictions, the data are not publicly available.

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[DOI: 10.61882/edcj.18.2.105]