Original Research

Educational Process and Factors Related to Academic Achievement of Dental Students at Mazandaran University of Medical Sciences

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Abstract

Background and purpose: The problem of academic failure is one of the major issues in the educational system in most countries. This study aimed to investigate the educational status and factors related to educational status of dental students at Mazandaran University of Medical Sciences in a 4-year period.

Materials and methods: This descriptive cross-sectional study was performed on 88 dental graduates of School of Dentistry at Mazandaran University of Medical Sciences in a 4 –year period that were selected by the census method. Information were collected through a review of documentation in a form. The data were collected in a confidential manner by referring to the students' educational files and with the agreement of the College Education Deputy. Data analysis was performed using SPSS software version 24.

Results: The mean age of the subjects was 27.45 ± 1.46 years. 49 were female and the rest were male. Also, 76 were single and 63 were in the dormitory. There was a significant relationship between age ($r = -0.29$, $p = 0.005$), gender ($p = 0.010$), and residence ($p = 0.029$) with clinical course score, but There was no significant relationship between marital status and the duration of diploma to university admission with clinical course score.

Conclusion: Based on the results of this study, male students, the students older than their classmates, and those living in student dormitories were among the groups prone to academic failure.

Keywords: Academic failure, Educational status, Dentistry, Mazandaran**.**

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Introduction

The problem of academic failure in education is one of the major issues in the educational system in most countries (1) and the resources that are wasted in this way, whether in the form of human life or in the form of financial and material resources, constitute significant figures.

Therefore, improving the efficiency of educational systems to a large extent is to prevent wastage of resources and reduce academic failure (3, 2). Educational failure, that is, not passing the courses, dropout or expulsion of potential human and financial talents of society, leads to adverse effects on individual's family life and creates many social disorders (4-6). Given that, the per capita education in Iran is based on national income, educational failure can impose a great burden on society's economy (7). The low academic performance of students can lead to the production of inefficient professionals and ultimately lower quality services and lack of welfare of the people. Individually, the phenomenon of academic failure for students leads to problems, such as economic bankruptcy, poor communication with the environment and reduced self-esteem (8, 9). Students have their own demographic and personality traits that can be an important factor in their performance at the university. External factors ,such as marital status, second job and residence status (student dormitory, home, father's house) also affect students' performance during course study (1, 10-12).). Among them, there are some factors indicating the student's ability to successfully complete a university course, these factors are: grade point average (GPA) of diploma, the time interval between completing high school and university admission, basic science grade point average and score of comprehensive basic sciences exam (11). The study of the mentioned factors can show the status of educational process of students at the university. Haqanifar et al., who studied the academic course and related factors in a 10-year period in Babol Dental School, the rate of academic failure was higher in the first year of university, especially in male students, with insignificant difference in the educational process of students in the term of marital status and living place (13). While in the study of Habibzadeh et al., inactivity was identified as one of the most important factors in students' academic failure (2). Performing such studies clarifies the educational situation of different groups of students in the fields of medical sciences, including dentistry. The outcomes of such studies identify shortcomings and achieving solutions to improve and enhance the educational process in these fields. Since no study has been conducted on the educational course of dental students at Mazandaran Dental School, this study aims to investigate the educational course and factors related to the educational status of dental students at Mazandaran University of Medical Sciences in a 4-year academic period (2009- 2012)

Materials and methods

This cross-sectional descriptive study was performed on 88 graduates of the Faculty of Dentistry of Mazandaran University of Medical Sciences in a 4-year academic period by census method. This study was approved by the Research Ethics Committee of Mazandaran University of Medical

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Sciences with the ethics code of IR.MAZUMS.REC.1398.1621. Only 88 out of 120 dental doctorate graduates, meet the inclusion criteria and entered the study by census method. Inclusion criteria were: the students registered at Mazandaran Dental School from 2009 to 2012 through the national entrance exam, benefiting the quota of regions (1, 2 and 3). The exclusion criteria were: the students who passed two semesters at other universities of medical sciences, students with a background in oral health who entered the doctorate program in dentistry with procedures other than the national entrance exam, graduates at foreign universities registered at Mazandaran Dental School for a postgraduate course, students of other quotas, transfer students and the permanent guests students (13). Data of documents were collected in a form, including demographic characteristics such as, age, sex, year of entry, marital status (students married before entering university), residence status, time interval between completion of high school and admission to university, the grade point average (GPA) of diploma, GPA of basic science courses, score of comprehensive basic sciences exam, GPA of clinical science courses and the failed credits. The data were collected referring to the educational files of students with the agreement of the Vice Chancellor for Education (13). Data analysis was performed using SPSS software version 24. Data were described with mean, standard deviation, median, range of interquartile, range of changes and quarters. Normal distribution was assessed by Shapirvillek test. The comparison between qualitative variables was done by Chi-square test or Fisher's exact test. Comparing the mean scores between the sexes was done with independent t-test or Mann-Whitney text. The relationship between quantitative variables, such as diploma GPA with basic science score, etc. was determined by Pearson or Spearman correlation coefficient. The $p < 0.05$ was considered significant.

Results

In this descriptive statistical study, the frequency, percentage, mean and standard deviation have been used to describe the obtained data. Also, to analyze the hypotheses, first, the assumptions of the required tests were examined. Therefore, to evaluate the normality of data distribution, the Shapiro – Wilk test and to evaluate the homogeneity, the Kolmogorov – Smirnov test and Shapiro – Wilk test, were used. In case of established variance in the groups, Levon's test was used, if the relevant hypotheses are made the independent t-test and Pearson correlation, and if the hypotheses are not confirmed the Mann-Whitney test was used for analysis. It should be added that, these calculations were done using Spearman correlation, using SPSS software version 24.

The mean age of the subjects in this study was 27.45 ± 1.46 years and the minimum and maximum ages were 24 and 30 years, respectively. According to the available data, 49 (55.7%) participants were female and 39 (3.44%) were male; 76 (4.86%) were single and 12 (6.13%) married; 63 (61.71%) out of 88 students lived in dormitories and 25 (4.28%) lived at homes. According to the available data, the highest frequency was related to the year of obtaining diploma in

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2009 with 23 (26.1%) subjects and the lowest frequency was related to 2006 with 2 (2.3%) subjects, (Table 1).

The table below shows the frequency of subjects surveyed based on the time distance from the diploma to entering the university by month. The available data, indicate the highest frequency with the interval of 14 months in 43 (48.9%) subjects and the lowest frequency with the interval of 62 months in the 1 (1.1%) subject, (Table 2).

The mean GPA of the subjects in this study is 18.37 ±1.15. The lowest and highest GPA of the subjects are 12.11 and 19.86, respectively. The mean GPA of the basic sciences of the subjects in this study is 15.48± 1.06. The lowest and highest GPA of basic sciences are 13.39 and 18.10, respectively. The mean GPA of clinical courses in this study is 16.56 ±0.84. The lowest and highest GPA of clinical courses are 14.66 and 18.29, respectively. The mean total score of basic sciences of the subjects in this study is 133 ±23.97. The lowest and highest total scores of basic sciences are 79 and 184, respectively. The average number of non-passed credits in this study is 5.07 ±7.36. The minimum and maximum number of non-passed credits are 0 and 36, respectively. We found that, 67 (76.1%) were not accepted for post graduate study and 21 (9.23%) were accepted for post graduate study.

Table 3 shows the relationship between the scores obtained in basic science, clinical and basic science exams with age. Based on the results, there was a significant and inverse relationship between age and the score of clinical courses (r = -0.229, p = 0.005). The score obtained in clinical courses decreased with age (Table 3).

The table below shows the relationship between educational status and gender. Based on the results, there was a significant relationship between gender and the score of clinical courses (p = 0.010). The average score of clinical courses in women was higher than in men (Table 4).

Table 5 shows the relationship between educational status and marital status. Based on the results, there was insignificant relationship between marriage and course scores (p = 0.010), (Table 5).

Table 6 shows the relationship between educational status and living place. Based on the results, there was a significant relationship between the score of the basic science examination and the living place (P = 0.029). Subjects who lived in the house scored a higher average.

Based on the obtained data, there was insignificant relationship between course scores and the time interval between getting diploma and university admission (Table 7).

Table 8 shows the study of the relationship between diploma GPA, basic science GPA, clinical course GPA and comprehensive basic sciences examination score. It shows that, the increase of each of the studied variables had a positive and significant relationship on the other variable. To the extent that, with increasing the diploma score, the GPA of basic sciences, clinical courses as well as the score of the comprehensive exam also increases.

Discussion

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The problem of academic failure is one of the major issues in the educational system in most countries (1) and the resources that are wasted in this way, whether in the form of human life or in the form of financial and material resources, is a significant figure.That is why, improving the efficiency of educational systems to a large extent is to prevent the waste of resources and reduce academic failure (3, 2). Studies on the educational status of students and also the factors affecting their academic failure will clarify the educational status of different groups of students in the fields of medical sciences, including dentistry. Since no study has been done on the educational course of dental students in Mazandaran Dental School, this study aims to investigate the educational course and factors related to the educational status of dental students at Mazandaran University of Medical Sciences in a 4-year period (from 2009 to 2012).

Based on the results of this study, there was a significant and inverse relationship between age and the clinical courses score. In other words, with the increase of age, the scores of their clinical courses also decreased significantly. Khazaei et al., found that young people were more successful in the comprehensive exam than the other age groups (14). The success of more young students in this examination was similar to the report of Rudbari and Fallah (15, 16). Mashouf et al., Showed that, in general, younger students had better average scores in specialized and general courses compared to older students (14). The results of all these studies are in line with our findings. Various factors, such as the age related mental distractions and other issues can cause younger students to be more motivated and empowered to study and subsequently gain higher grades, though Ramezani et al., showed statistically insignificant difference between students' motivation of education and age (17), but more studies are needed to be done in this regard.

We found a significant relationship between gender and the clinical courses score that is, the average of clinical courses score was higher in women. Hazawai et al., have shown that the number of the students who failed was higher in male students at Hamadan University of Medical Sciences (18). The obtained data showed that in general, female students compared to male students had better average of scores in specialized and general courses (14). In the study of Haghanifar et al., The mean (GPA) of basic science courses and comprehensive dental exam was significantly higher in female students (13). The data of Moghaddamnia et al., on medical students registered in 1996 confirm our findings (19). Given that, female students were successful in achieving higher grades, it is necessary to somehow strengthen the motivation of fresh male students and solve the barriers against achieving higher grades, through effective counseling and supervision. At the same time, considering that, the study of the educational process is a complex and multifactorial issue, it is necessary to design studies that simultaneously examine the performance of faculty members at each level.

Findings also showed insignificant relationship between marriage and course scores. Haghanifar et al., observed insignificant difference in the educational process of students according to marital

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status (13). Ramezani et al., found statistically insignificant relationship between students' academic motivation and marital status (17), which is in line with the results of our study indicating no relationship between marital status and educational status of students. Mushaf noticed that, in general, single students had better average scores in specialized and general courses compared to married students (20). Aghajani et al., have shown that, single students are more successful in their studies, inconsistent with the results of our study (19). The dissimilarly of the data with our findings could be explained by the differences in the study subject, demographic characteristics, sample size the inclusion and exclusion criteria. Further studies are recommended to examine the exact effect of marital status on educational conditions. Because the results of different studies in this regard are completely contradictory and on the other hand, marital status is a very complex situation that could have positive and negative impacts on students' educational status. According to the results of this study, there was a significant relationship between the score of the basic science exam and the living place, so that, subjects who lived at home had a higher average score. Habibzadeh et al., stated, distance from family as one of the most important factors in students' academic failure (21). In the study of Khazaei et al., The difference between the mean GPA of the total basic sciences course of the native participants was significantly higher than that of the non-native individuals (14). The results of these studies are in line with our data indicating that, native students have a better educational status than the non - native students living in student dormitories. Due to the existing problems of living in the dormitory, it is expected that students living in the dormitory will suffer from academic failure due to lack of favorable conditions for studying, proper sleep, proper nutrition and also mental problems. The dormitory affairs officials should pay special attention to this issue.

Haghanifar et al., noticed insignificant difference in the educational process of students according to their living place (13). Ramezani et al., found insignificant relationship between students' academic motivation and residence status (17). Dastrange found insignificant relationship between the impacts of student residence on academic achievement (22). In other studies, it has been found that the average of educational variables of students living in dormitories are not significantly different from others (16, 23, 24), which is not in line with the results of our study. The contradiction between the results of these studies and our findings could be explained by the differences in the study subjects, demographic characteristics, sample size the inclusion and exclusion criteria.

The obtained data shows insignificant relationship between course grades and the time interval between getting diploma and university admission. In Haqqanifar's study examining the time interval between diplomas to university admission, the mean GPA of basic science courses and basic science exam scores were significantly higher in students who entered the university immediately after getting diploma. But in cross-sectional clinical courses, a reverse trend was observed; that is, those who had a

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longer time interval from the diploma to the university admission, scored higher scores, with insignificant difference, which requires further study (13). Dastranj et al., found that students who entered university immediately after getting diploma were more likely to experience academic success (22). The difference of the data with our findings could be explained by the differences in the study subject, demographic characteristics, sample size the inclusion and exclusion criteria.

This study findings showed that with increasing the diploma score, the GPA of basic sciences and clinical courses score also increases, as well as the score of the comprehensive exam. But with insignificant relationship between the GPA of the diploma and passing the post graduate exam.

Our obtained data indicate that, male students, students older than their classmates and students living in dormitories are among the groups at risk of academic failure. It is suggested that student affairs authorities pay special attention to improving living conditions in dormitories. It is also suggested the presence of psychologists in student dormitories to lessen the negative impacts of distance from family in non-native students. Also further studies suggested on the impact of different dimensions of marital status on educational conditions. Also, conducting a study that examines and compares the educational status of students by their field of study could also help the authorities to more accurately identify students at risk of academic failure. The limitation of this study could be attributed to the difficulty and costly on the study the factors related to the impact of married life on students' educational status.

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Table 1- Frequency of the study subjects based on the year of getting diploma

%	Number	Year
3/2	2	85
3/19	17	86
2/18	16	87
1/26	23	88
7/22	20	89
4/11	10	90
100	88	Total

Table 2: Frequency of the study subjects based on the time distance of getting diploma to the university admission

%	**Number**	**Time(month)**
9/48	43	14
9/40	36	26
1/9	8	38
1/1	1	62
100	88	**Total**

Table 3 - Summary of the findings on the relationship between the scores obtained in basic science, clinical and basic science exams with age

	Course scores

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Basic science exams (from 200)	Clinical courses (from 20)	Basic science courses (from 20)	
r=07/0 p=478/0	r=-29/0 p=005/0	r=-08/0 p=440/0	**Year**

Table 4 - Summary of the findings on the relationship between educational status and gender

Significance	Statistics	Gender		Course scores
		Female(n=49) Mean ± Sd	Female(n=49) Mean ± Sd	
469/0	728/0	75/15 ± 98/0	91/15 ± 12/1	**Basic science courses (from 20)**
010/0	64/2	30/16 ± 81/0	77/16 ± 83/0	**Clinical courses (from 20)**
546/0	-60/0	74/134 ± 56/22	61/131 ± 18/25	**Basic science exams (from 200)**

Table 5 - Summary of the relationship between educational status and marriage

Significance	Statistics [a a]	Marital status		Course scores
		Single(n=76) Mean ± Sd	Married(n=12) Mean ± Sd	
299/0	04/1	79/15 ± 08/1	14/16 ± 88/0	**Basic science courses (from 20)**
310/0	02/1	52/16 ± 86/0	79/16 ± 71/0	**Clinical courses (from 20)**
768/0	29/0	69/132 ± 02/24	91/134 ± 62/24	**Basic science exams (from 200)**

Table 6- Summary of the findings on the relationship between educational status and living place

Significance	Statistics [a]	Residence

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		dormitory (63=n) Mean ± Sd	Home (25=n) Mean ± Sd	**Course scores**
389/0	86/0	78/15 ± 07/1	99/15 ± 01/1	**Basic science courses (from 20**
601/0	52/0	53/16 ± 81/0	64/16 ± 94/0	**Clinical courses (from 20)**
029/0	22/2	49/129 ± 32/23	76/23 ± 84/141	**Basic science exams (from 200)**

Table 7- Summary of the findings on the relationship between educational status and the time interval between obtaining diploma and university admission

Significance	**Statistics**	**Interval between diploma and university admission**		**Course scores**
		More than two years (n=45) Mean ± Sd	Less than two years (n=43) Mean ± Sd	
544/0	60/0	77/15 ± 98/0	91/15 ± 13/1	**Basic science courses (from 20**
412/0	82/0	49/16 ± 84/0	64/16 ± 85/0	**Clinical courses (from 20)**
202/0	28/1	80/129 ± 42/23	34/136 ± 36/24	**Basic science exams (from 200)**

Table 8- Summary of the relation between the GPA of diploma, GPA of basic sciences, GPA of clinical courses and score of comprehensive test of basic sciences

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Comprehensive test score	GPA of clinical courses	GPA of basic sciences	Diploma GPA	
-	-	-	-	**Diploma grade point average**
-	-	-	r=384/0 p<001/0	**GPA of basic sciences**
-	-	r=654/0 p<001/0	r=552/0 p<001/0	**GPA of clinical courses**
-	r=566/0 p<001/0	r=699/0 p<001/0	r=303/0 p=004/0	**Comprehensive test score**

We found insignificant relationship between the GPA of the diploma and acceptance in the post graduate exam (p = 0.860).

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