Study Motives and Career Choices of Iranian Medical and Dental Students

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Abstract- To compare the study motives and career choices of senior undergraduate medical and dental students in Iran. A cross-sectional questionnaire-based survey study involving final year medical and dental students from 4 dental and medical schools was conducted in 2010. The questionnaire was designed in three sections (Demographic details, motivational items and career choice items) and after confirming the validity and reliability of the questions, it was distributed among the students. Data were entered into SPSS; statistical analysis included logistic regression and multiple linear regression. The response rate was 62% (n=219) for medical and 64% (n=300) for dental students. The factor analysis identified six motivational items: "Social and professional status", "Health care and people", "Others' recommendation", "personal interest and nature of occupation", "Occupational experience" and "Personal life". Medical students were more influenced by "Playing a role in community health" and "Personal interest". "Work independence" and "Social factors" however were two major influential factors among dental students. There were significant differences in important influences by age (Social and professional status, Others' recommendation), Parents' education (Social and professional status, Health care and people, Personal life) and marital status (single >married: Occupational experience, married > single: Personal life). Engaging in postgraduate studies was the first career preference among 90.9% and 89.8% of dental and medical students respectively. Medical and dental students report a wide range of motivational factors in studying medicine/dentistry and future career plans which is affected by age, parents' education and marital status.

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Introduction

In recent decades, there has been great emphasis on the responsibility of health care professionals, including dentists and doctors, to protect and enhance the health of the general public. Social, political and economical changes may however, have impact on the healthcare workforce, and subsequently play a critical role on health care systems (1,2).

Numerous motivational factors have been described for medical and dental students throughout the literature. Some factors such as social standing and high professional status seem to be equally important to both groups of students in inspiring them to choose their major whereas other factors may outweigh the others in motivating students to choose dentistry over medicine or vice versa among different populations (3). For instance, the majority of dental students mentioned higher social status and income (3-5); ability to be self-employed (4,6); artistic nature of the career (4-7); helping people (1,4,5,7,8) and general interest in dentistry (7,9) as the most important factors influencing their choice of career. Medical students however noted other factors such as altruism, aptness, social prestige and challenging nature of the occupation as the key factors which derived them toward medicine (10,11).

On the other hand, social and epidemiologic studies have documented that demographic characteristics of a population is also an important determinant which influences the motivations and career expectations of medical and dental students. Age, gender, ethnicity and parents' educational background have been mentioned as factors which may affect the career choices to varying degrees among different populations (12,13). For

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example, business-oriented motives seem to be a greater concern to male students while female dental students were more concerned with people-oriented motives (14,15).

A number of recent studies have investigated the motivations underlying the career choices of dental and medical students independently (16-18) . However, to the best of our knowledge, no studies have been conducted to compare the study motives and career expectations among medical and dental students simultaneously.

The objective of the research presented in this paper is to investigate Iranian medical and dental students' perceived motivation for their professional career as well as career expectation in relation to their age, sex, marital status and parents' education.

Materials and Methods

A questionnaire was initially constructed to assess the study motives and career choices of final year medical and dental students in Tehran, Iran. Questions were initially designed according to previous studies (14,19). The validity of the questions was checked by five dental, five medical and two psychiatry faculty members. The questions were subsequently amended accordingly and piloted on 10% of the study population who were not included in the final analysis. Forty participants repeated the questionnaire after a lapse of 3 weeks to provide an estimate of test-retest reliability. The test-retest reliability of the questionnaire, as expressed by mean test-retest intra-class correlation coefficient was satisfactory for both parts of study motives (ICC=0.78) and career choices (ICC=0.71).

The internal consistency reliability of the questions was verified at Cronbach's alpha coefficient of 0.78. The ultimate questionnaire consisted of three sections. The first section addressed the students' demographic data including age, sex, marital status, parents' education and mode of entrance to the university. The second section included 17 items on motivational factors and the third section comprised of 12 items concerning future career choices. The average time needed to answer all of the questions was 10 minutes.

Based on numerous factors such as departmental facilities, number of publications and faculty: student ratio, medical and dental schools in Iran are ranked into three categories. We intended to obtain information from students of all three categories. Thus, the study population consisted of 350 medical and 470 dental students from Shahid Beheshti University of Medical Sciences, Tehran University of Medical Sciences, Azad University; Medical and Dental division and Shahed Dental and Medical school) representing students from all three categories. For the dental group, final year students were accessed at the national entrance exam for residency program in Summer 2010 whereas for the medical group, questionnaires were taken to the associated hospitals (Boo-Ali, Javaheri, Amir-al-momenin and Mostafa Khomeini Hospitals) and distributed among medical interns in Autumn 2010. Both dental and medical students were briefed about the aims of the study and were asked to fill out the questionnaires voluntarily and anonymously.

The students were asked to rank the study motives' set of questions on a five point Likert scale from 1(unimportant) to 5(very important) and the career choices' set of questions from 1 (strongly disagree) to 5 (strongly agree). Data were submitted to SPSS version 13 for statistical analysis. A factor analysis of the questions was used to determine the principal latent determinants of the study motives and carrier choices'.

Logistic regression is used to adjust the effect of covariates (i.e. age, gender, marital status and parents' education) in comparing the effect of field of study on study motives and career choices' questions. Bonferroni adjustment was used for multiple comparisons in each dimension. A factor analysis of the questions was performed to determine the principal factors that drove the influences for final year students and aggregate scores were derived for each principal determinant in order to assess the relationship between demographic variables and the motivational factors among both majors by means of linear regression.

Results

A response rate of 62% (n=219) for medical and 64% (n=300) for dental students were achieved. The mean age of dental and medical students were 29.98 (SD=5.88) and 24.91 (SD=2.69) respectively; which was significantly different (P<0.0001). Female population exceeded males in both medical (53.7%) and dental (60.4%) group. Medical students had significantly higher educated parents (Parents with an academic degree were defined as highly educated) compared to dental students. The percentage of married dental students however was significantly higher than medical students (Table 1). To identify major motivational factors, we used principal component analysis, and the factors were rotated by varimax rotation. The natural interpretation of the factors in conjunction with eigenvalues >1 and the screen test determined whether a factor should be retained.

Table 1. Demographic characteristics of medical and dental students.

Demographic variables	Medical (N=219)	Dental (N= 300)	*P*-value
Age range (mean±SD)	24.91±2.69	29.98±5.88	<0.0001
Femal/male (%)	117 (53.7%)/ 101 (46.3%)	180 (60.4%)/ 118 (39.6%)	0.126
Married/Single (number (%))	45 (20.6%)/ 173 (79.4%)	136 (45.8%)/ 161 (54.2%)	<0.0001
Father with academic degree (%)	164 (74.9%)	169 (56.7%)	<0.0001
Mother with academic degree (%)	132 (60.8%)	106 (35.6%)	<0.0001

We derived 6 factors and labeled them on the basis of our interpretation of the data and of the earlier literature. The six principal factors explained 64.05% of the total variability contained in the questionnaire.

The first factor, explaining 13.1% of the variability, was related to Social and professional status of the job. The second factor, which we will refer to as the healthcare-people factor, explained 12% of the variability. The third factor was the influence of Others' recommendation and advices and explained 10.4% of the total variability. The fourth factor which explained 10.3% of the variability, referred to personal interest and nature of occupation. The fifth and sixth factors, each of which explained 9.3% and 9.1% of the variability, referred to influences from occupational experience and personal life.

The questions that have the higher loadings in each of the six motive dimensions were identified: as social and professional status (Q6,Q7,Q8,Q13), health care and people (Q9,Q10,Q11), Others' recommendation (Q2,Q3,Q18), personal interest and nature of occupation (Q4,Q5), occupational experience (Q16,Q17), personal life (Q12,Q14).

Having adjusted the effect of covariates and multiple comparison tests in each dimension, table 2 compares the percent of medical and dental students determining the "important" and "very important" motivational factors with respect to their subject area by the factors relating to the six dimensions of career.

Medical students were insignificantly more influenced by "Playing a role in community health promotion" (83.4%). Moreover, "personal interest" was a stronger motivational factor among medical students.

Table 2. Percentage of "important" and "very important" motivational factors in Medical Vs. Dental students.

Questionnaire items relating to the 6 dimensions	Dental students number (%)	Medical students number (%)	*P*-value
Dimension 1: Social and professional status			
Q6. Income	243 (84.7)	127 (64.5)	<0.0001
Q7. Work independence	263 (93.6)	165 (81.3)	0.004
Q8. Social status	259 (93.5)	182 (89.7)	0.152
Q13. Social and matrimonial considerations	153 (58.8)	81 (40.1)	<0.0001
Dimension 2: Health care and people			
Q9. Helping people to improve their health	245 (88.1)	169 (84.9)	1
Q10. Playing a role in community health promotion	224 (81.2)	166 (83.4)	0.276
Q11. Interest in research	174 (64)	122 (61)	1
Dimension 3: Others' recommendation			
Q2. Parents' recommendation	198 (71)	134 (63.2)	0.03
Q3.Friends' advice	130 (48.9)	57 (27.8)	<0.0001
Q18. Career advisors	81 (36)	56 (30.6)	0.03
Dimension 4: personal interest and nature of occupation			
Q4. Personal interest	247 (86.7)	182 (87.1)	0.664
Q5. Combination of practical and theoretical skills	244 (87.1)	152 (76.4)	0.026
Dimension 5: Occupational experience			
Q16. Personal experience	126 (48.6)	53 (27)	0.002
Q17. Influence of parents (as a doctor or dentist)	132 (53)	76 (42)	0.036
Dimension 6: Personal life			
Q12. Devoting more time to self and family	159 (60)	76 (38.6)	0.002
Q14. Occupational stress	117 (45)	62 (31.5)	0.05

Table 3. Multiple linear regression models for the six principal latent factors that drive the influences for final year students.

Dependent variable	Independent Variables	B	P value	(95%) CI
Dimension I: Social and professional status	Constant	17.85	<0.0001	(15.664; 20.031)
	Field of study (Dentistry vs. Medical)	2.03	<0.0001	(1.415; 2.637)
	Gender (female vs. Male)	-0.035	0.233	(-0.917; 0.224)
	Age (each year increment)	-0.121	0.001*	(-0.192; -0.050)
	Marital (married vs. single)	-0.290	0.351	(-0.901;0 .321)
	Parents' Education (At least one parent with an academic education vs. none)	-0.99	0.001*	(-1.584; -0.409)
Dimension II: Health care and people	Constant	11.57	<0.0001	(9.743; 13.394)
	Field of study (Dentistry vs. Medical)	-0.13	0.622	(-0.659; 0.394)
	Gender (Female vs. Male)	0.48	0.055	(-0.010; 0.964)
	Age (each year increment)	0.005	0.865	(-0.053; 0.064)
	Marital(married vs. single)	0.36	0.179	(-0.164; 0.878)
	Parents' Education[2]	-0.69	0.007*	(-1.192; -0.193)
Dimension III: Others' recommendation	Constant	10.25	<0.0001	(7.698; 12.802)
	Field of study (Dentistry vs. Medical)	1.64	<0.0001	(0.914; 2.359)
	Gender (Female vs. Male)	0.22	0.522	(-0.449;0 .884)
	Age (each year increment)	-0.14	0.001*	(-0.221; -0.054)
	Marital (married vs. single)	-0.005	0.989	(-0.731; 0.721)
	Parents' Education	-0.4	0.256	(-1.088; 0.290)
Dimension IV: personal interest and nature of occupation	Constant	8.156	<0.0001	(6.969; 9.344)
	Field of study (Dentistry vs. Medical)	0.25	0.154	(-0.095; 0.602)
	Gender (Female vs. Male)	0.228	0.164	(-0.093;0.550)
	Age (each year increment)	-0.009	0.630	(-0.047;0.029)
	Marital (married vs. single)	0.123	0.496	(-0.232; 0.478)
	Parents' Education[2]	-0.204	0.229	(-0.538; 0.129)
Dimension V: Occupational experience	Constant	5.17	<0.0001	(3.141; 7.197)
	Field of study (Dentistry vs. Medical)	0.98	0.001*	(0.407; 1.549)
	Gender (Female vs. Male)	-0.224	0.407	(-0.755; 0.307)
	Age (each year increment)	0.015	0.656	(-0.050; 0.079)
	Marital (married vs. single)	-0.87	0.003*	(-1.433; -0.303)
	Parents' Education[2]	0.49	0.077	(-0.053; 1.043)
Dimension VI: Personal life	Constant	5.68	<0.0001	(4.243; 7.111)
	Field of study (Dentistry vs. Medical)	0.69	0.001*	(.288; 1.103)
	Gender (Female vs. Male)	0.19	0.325	(-0.189; 0.569)
	Age (each year increment)	-0.03	0.190	(-0.076; 0.015)
	Marital (married vs. single)	0.42	0.047*	(0.006; 0.825)
	Parents' Education	-0.39	0.052	(-0.776; 0.003)

Dental students were significantly more likely to be motivated by factors relating to social and professional status, others' recommendation and personal life.

In the "social and professional status" factor, dental students were significantly more likely to mention motivators such as high income (P<0.0001), working independency (P=0.003), Social and matrimonial considerations (P<0.0001) than medical students.

According to the "Others' recommendation" factor, dental students were significantly more likely to mention motivators such as family advising (P=0.02), others' advices (P<0.0001) and career advising consultants (P=0.03) than medical students.

Table 3 demonstrates the multiple linear regressions for the six motivational dimensions in terms of the major and demographic variables. Students with lower educated parents seemed to have been more significantly

motivated with dimensions 1 and 2. "Social and professional status" and "Others' recommendation" were two dimensions which was markedly noted as important factors to inspire younger students (*P*=0.001). Dimensions 5 and 6 were significantly affected by students' marital status. Unmarried students were markedly motivated by "occupational experience" (*P*=0.003) whereas "personal life" considerations seemed to be more significantly noted by married students (*P*=0.047). Female students were marginally more motivated by health care and people dimension (*P*=0.055). By controlling the effect of other covariates by multinomial regression it was found that dental students compared with medical students were more significantly motivated with social and professional factor (*P*<0.0001), "others recommendation" (*P*<0.0001) , "occupational experience" (*P*<0.0001) and 'personal life" dimension (*P*<0.0001).

Table 4 summarizes the percent of medical and dental students "strongly agreeing" or "agreeing" the preferable future career in 4 potential areas of performance.

The first career preferences among both medical and dental students were "Private practice" and seeking "Postgraduate studies".

Medical students were significantly more interested in being employed in the public sector as a physician (*P*=0.004) and working in the country's health system as a doctor (*P*=0.02). By contrast, dental students expressed significantly more desire in following an academic career as a university professor (*P*=0.006), getting engaged in economic and commercial activities related to their field (*P*<0.0001), and being employed in executive jobs in the ministry of health services (*P*=0.015).

Discussion

Study motives

This study evaluated the motivations and career choices among final year undergraduate medical and dental students with respect to their sex, marital status and parents' education. For this purpose, a primary questionnaire was created which included a variety of motivations from different studies and career choices for medical and dental students (10,14,19).

The questionnaire was then standardized to address the study population. However, since our data were obtained with a self-administered questionnaire, these results should be interpreted with some caution. Furthermore, this study evaluated the study motives of final year students. Previous reports have demonstrated that senior students provide more realistic answers regarding their motivation in choosing their major (14).

Table 4. Percentage of "important" and "very important" preferable job questions in Medical vs. Dental students by the factors relating to the four dimensions of job choices.

Career choice items	Dental students number (%)	Medical students number (%)	*P*-value
Dimension 1: Shared business and governmental occupation			
Q2:Contract to work in clinics	111 (47.8)	76 (40.2)	1
Q4:Being employed in the public sector as a dentist/ physician	91 (39.6)	98 (52.4)	0.004
Q5:Being employed in non-governmental organizations as a dentist/ physician	103 (45.2)	105 (59)	0.06
Q6:Working in the country's health network system as a dentist/ physician	86 (37.9)	77 (44.3)	0.02
Dimension 2: executive positions and research			
Q7:Administrative role for the Department of Social Medicine or Oral Health	110 (50.2)	62 (37.6)	0.30
Q8:Working in the field of dental/medical research	148 (64.9)	95 (55.2)	0.15
Q12: An executive position in the ministry of health	85 (39.9)	47 (27.3)	0.015
Dimension 3: Advanced academic occupation			
Q9:Pursue a medical/dental specialty	219 (90.9)	168 (89.8)	1
Q10:Pursue an academic position	189 (80.8)	128 (67.7)	0.006
Dimension 4: Private practice			
Q1:Work in private practice	222 (90.6)	163 (86.2)	0.91
Q3:Partnership with colleagues and establish a dental / medical clinic	159 (68.2)	140 (74.1)	1
Q11:Interested in economic and commercial activities related to discipline	125 (55.1)	66 (36.9)	<0.0001

A considerable number of studies have previously evaluated inspirational factors which led to studying medicine or dentistry separately; however, to the best of our knowledge, the present research was the first to compare study motives and career choices among medical and dental students simultaneously (17,20-22).

Our analysis revealed that medical and dental students' interest in pursuing either major as a career are organized around six principle factors. Dental students seemed to have significantly stronger motivations in all aspects except "Healthcare and people" (Q9,Q10,Q11) in which the difference was not significant between medical and dental students. "Personal interest" was a notable item which was insignificantly stronger among medical students (87.1%). These findings were partly in agreement with those of Mukhtar's *et al.* (2009), Mulnar's *et al.* (2008) and Puljak's *et al.* (2007) who reported altruistic motivations and personal interest as the major factors to drive students toward medicine (10,17,23). In the present evaluation dimensions 1 and 3 i.e. "Social and professional status " and "Others' recommendation" were significantly affected by age rendering that these factors seem to have stronger impact on students' choice of career. Linear regression models further revealed that dimension 5 i.e. "Occupational experience" was strongly more influential among unmarried students and dimension 6 i.e. "Personal life" was influential among married students in their choice of career. In a survey in Canada, married students and those who received social support from parents were shown to have less occupational stress which partially explains the significant correlation between "married" status and "Influence of parents" (Q 17) and "Occupational stress" (Q14) (24).

Most of the motivational items evaluated in our survey and the results retrieved were more or less in concordance with the previous reports (3,25,26). However, one of the notable items which were significantly more important in motivating students toward dentistry was “matrimonial considerations” (Q 13). To the best of our knowledge, this item has not been considered in previous studies. The factor analysis demonstrated that this item seems to be in line with other inspirational factors such as “Social status”, “income” and “work independence” (Table 2). This may also explain the greater percentage of married dental students compared to their medical counterparts (Table 1).

Career choices

A vast majority of senior medical (89.8%) and dental (90.9%) students in the present study sought advanced education in dental or medical specialties upon graduation followed by getting engaged in sole private practice as the second future plan priority. This was consistent with Khami’s and Gallagher’s reports regarding dental students. Karibe *et al.,* however presented that 64% of Japanese and 47% of Swedish dental students planned to work as general dentists and only 37% and 17 %of Swedish and Japanese students preferred specialization in dentistry respectively (12).

The fact that medical student have a marked trend toward postgraduate medical specialties have been repeatedly documented throughout the literature (27-29). Parsa *et al,*. listed a number of factors associated with choosing general practice which included: medical school characteristics, personal interactions, lifestyle preferences, and personal aptness; workforce factors, which include expected income, prestige, job opportunities, longitudinal care, societal need and the availability of role models (30).

A survey of general surgery residents revealed a powerful effect of demographic factors such as gender and marital status on their career planning. Single residents were significantly more likely to plan for fellowship programs (31). The findings of the present survey reported that female students were more determined to pursue postgraduate studies and become engaged in an academic career regardless of the major.

A pilot study on Harvard postgraduate applicants revealed that gender and relationship status significantly influenced their choice of pursuing postgraduate education in different fields of dentistry. In this respect, parents’ influence was ranked the least important (32). A recent study in Canada has also revealed greater interest toward specialty medicine against family medicine among medical students (28).

In a survey in Australia, although a substantial proportion of final year medical students indicated that they were interested in clinical teaching, only 13 percent of them were actually interested in pursuing an academic career (33).

Declining interest in academic dentistry is a major concern among many societies (34). Dental faculty members often complain of low salary, heavy workload and full time working hours and thus have less desire in getting an academic position (35). Considering the fact that one of the major motivations in choosing dentistry is independent working hours, most dentists would prefer to reduce their working hours and devote more time to self and family (36). A considerable percentage of dental students in the present study however, showed significantly greater interest in pursuing an academic

career compared to their medical counterparts (Table 4). A previous study in Isfahan had also documented marked interest in research activities among dental students (37).

Medical students of our survey expressed the least interest in getting engaged in executive positions in the national health system whereas dental students' least desire among the future potential career was to serve as a state dentist (Table 4). In general, both medical and dental students were more likely derived toward private practice upon graduation or pursuing an academic career after specializing in either field. This finding was in line with previous reports (13,19,38). In conclusion, this survey revealed that dental and medical students are motivated by a variety of factors some of which were significantly affected by gender, marital status and parents' academic background. In terms of future career choices, medical and dental students are generally more tended toward private and academic careers compared to governmental occupations.

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