

## Serious Gender Imbalance in Medical and Dentistry Majors: How to Prevent a Crisis

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### Abstract

**Background and Purpose:** Decreased males' motivation for entering universities has caused a low male/female ratio in different university majors. In 2005-2006 academic year, enrollment of female students in Rafsanjan University of Medical Sciences reached 83.14%. This tremendous gender imbalance may lead to the development of a mono-sex system for health service providers and will affect the social health system. As females constitute the majority of students in all medical sciences majors, in this study academic achievement of girls is compared to that of the boys.

**Methods:** This cross-sectional study was performed on 114 medical and 50 dentistry students who were enrolled at Rafsanjan University of Medical Sciences in the spring of 2003. Grade-point average (GPA) was used as a marker for academic achievement. The scores were classified into 3 groups; A (17-20), B (14-16.99) and C (less than 13.99). Data were analyzed by Chi-square test.

**Results:** This study indicated that not only girls constitute the majority of students in the Medicine and Dentistry majors, but also the academic achievement of girls was significantly higher than that of the boys. Among medical students only 2.7% of the boys had A scores, while 18.2% of the girls had A scores. Furthermore, among dentistry students, none of the male students had A scores while 8% of the girls had an A score.

**Conclusion:** It seems that the observed differences, are not related to academic intelligence. These differences may have originated from the decreased motivation in male students for studying efficiently after the enrollment.

**Key words:** ACADEMIC ACHIEVEMENT, FEMALE TO MALE RATIO, MEDICAL AND DENTISTRY STUDENTS, RAFSANJAN

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### Introduction

A tremendous change has occurred in the gender pattern of the world of academic medicine over the past three decades (1). In Iran and many other countries, the number of female medical students has been steadily increasing (2-5). Understanding the historical, economic and social trends are necessary for understanding the status

of women in medicine and management. While in many past cultures working as physicians was a suitable job for women, after about 1500 in Europe, women physicians became much less evident. In the 19th century, women began to reenter medicine in the United States (6). In recent years equal numbers of male and female students have been graduated from medical schools in western countries (7). Decreased males' motivation for entering universities has caused a low male/female ratio in different university majors. Enrollment of female students

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in Rafsanjan University of Medical Sciences for the 2005-2006 academic year reached a record high of 83.14% compared to 77%, 77.65% and 79.38% for the 2002-2003, 2003-2004, and 2004-2005 academic year respectively. This dramatic increase in the number of women entering the medical profession may lead to the development of a gender shift in the physician workforce. On the other hand, studies performed in some developed countries, showed no difference in academic achievement between male and female students (7). As females constitute the majority of students in all medical sciences majors in Rafsanjan University of Medical Sciences, in this study academic achievement of girls is compared to that of the boys.

### Materials and Methods

This cross-sectional study was performed on 114 medical and 50 dentistry students who were enrolled at Rafsanjan University of Medical Sciences in the spring of 2003. Non-randomized sampling was used in this study. Grade-point average (GPA) was used as a marker for academic achievement. All students (different medical sciences majors) whose scores were available in the educational network of the university participated in this study. The scores were classified into 3 groups; A (17-20), B (14-16.99) and C (less than 13.99). As not being a local student might be related to the frequency of psychological and socio-economical problems in both male and female students, this factor was included in the analysis. Students who were residing within the borders of Rafsanjan city were considered as locals. Data were analyzed by Chi-square test.

### Results

Among medical students, 59 students (51.8%) were locals and 55 students (48.2%) were non-locals. Furthermore, among these students, 37 students (32.5%) were male and 77 students (67.5%) were females. Among dentistry students, 6 students (12.8%) were locals and 44

students (87.2%) were non-locals. Also among these students, 25 students (50%) were male and 25 students (50%) were females. Among medical students, 13.2% of students had A GPAs, 66.7% had B, and 20.2% had C or lower GPAs. Among dentistry students, 3.8% of students had A GPAs, 71.7% had B, and 24.5% had C or lower GPAs. Tables 1 and 2 shows the absolute and relative frequencies of medical and dentistry students categorized by gender and by being local or non-local.

Data presented in Table-1 indicate that among medical students only 2.7% of boys had "A" GPAs; while this percentage was 18.2% in female students. Furthermore, 64.9% and 32.4% of male students had "B" GPAs and "C" or less GPAs respectively; while these percentages were 67.5% and 14.3% in female students. This difference was statistically significant (P-Value < 0.05).

Among dentistry students, none of male students had "A" GPAs; while 8% of female students had "A" GPAs. Furthermore, 64% and 36% of male students had "B" GPAs and "C" or less GPAs respectively; while these percentages were 88% and 4% in female students. This difference was statistically significant (P-Value < 0.01).

Data presented in Table 2 indicate that there is no difference in academic achievement of students between local and non-local students. Both medical and dentistry students did not show any difference according their being a local or non-local student.

Among medical students 15.3% of local students had "A" GPAs; while this percentage was 10.9% in non-local students. Furthermore, 64.4% and 20.3% of local students had "B" GPAs and "c" or less GPAs respectively; while these percentages were 66.7% and 20.2% in non-local students. This difference was not statistically significant.

Among dentistry students none of local students had "A" GPAs; while this percentage was 4.5% in non-local students. Furthermore, 83.3% and 16.7% of local students had "B" GPAs and "c" or less GPAs respectively; while these percentages were 75% and 20.5% in non-local

students. This difference was not statistically significant. This study indicated that not only girls constitute the majority of students in the Medicine and Dentistry majors, but also the academic achievement of girls was significantly higher than that of the boys. As mentioned before, among medical students only 2.7% of the boys had A scores, while 18.2% of the girls had A scores. Furthermore, among dentistry students, none of the male students had A scores while 8% of the girls had an A score.

students of Rafsanjan University of Medical Sciences were men. With male students enrollment decreasing, the disadvantages of this serious gender shift should be studied. Female medical students/physicians may face major problems (3,8-10) such as:

1. Pregnancy and motherhood (high rates of long time leaves such as maternity leaves)
2. Family commitment and high rate of part-time jobs
3. High drop-out levels

**Table 1.** Absolute and relative frequencies of medical and dentistry students categorized by gender.

Gender Major	Male Students			Female Students			Total		
	A (GPA)	B (GPA)	C (GPA) or less	A (GPA)	B (GPA)	C (GPA) or less	A (GPA)	B (GPA)	C (GPA) or less
Medicine	1 (2.7%)	24 (64.9%)	12 (32.4%)	14 (18.2%)	52 (67.5%)	11 (14.3%)	15 (13.2%)	76 (66.7%)	23 (20.2%)
Df=2, P-Value<0.05									
Dentistry	0	16 (64%)	9 (36%)	2 (8%)	22 (88%)	1 (4%)	2 (4%)	38 (76%)	10 (20%)
Df=2, P-Value<0.01									

Relative frequencies are indicated in parantheses

**Table 2.** Absolute and relative frequencies of medical and dentistry students categorized by being a local or non-local student

Gender Major	Male Students			Female Students			Total		
	A (GPA)	B (GPA)	C (GPA) or less	A (GPA)	B (GPA)	C (GPA) or less	A (GPA)	B (GPA)	C (GPA) or less
Medicine	9 (15.3%)	38 (64.4%)	12 (20.3%)	6 (10.9%)	38 (69.1%)	11 (20%)	15 (13.2%)	76 (66.7%)	23 (20.2%)
Df=2, Not Significant									
Dentistry	0	5 (83.3%)	1 (16.7%)	2 (4.5%)	33 (75%)	9 (20.5%)	2 (4%)	38 (76%)	10 (20%)
Df=2, Not Significant									

## Discussion

The number of female students entering medical schools in Iran and many other developing and developed countries is increasing rapidly (2-5). In 2005, only 16.86% of first year medical

4. High stress levels
  5. Tending to specialize in certain gender-typical disciplines such as paediatrics.
  6. Financial pressure
- In 1996, 54% of UK university medical and dentistry students were women. In 2002, this

percentage increased to 61 % (3). UK medical schools have been encouraged to look at ways of attracting male students who are being heavily outnumbered by women. These ways may include admission of students from disadvantaged socioeconomic groups and ethnic minorities (3, 5). A similar gender shift can be observed in the US medical schools. In 1976, nearly 25% of the students entered US medical schools were women; while in 2001 women composed more than 45% of the first year medical school students (1).

Experts believe that better A-level results and more convincing extramural skills in women, is a good explanation for the higher number of women in medical schools. Furthermore, female students are usually more conscientious than male students are (7). Another reason may be that Iranian male medical students have compulsory military service after graduation and they cannot make their choice of specialty before finishing their military service. It has been also reported that 18-year-old male students were usually attracted to more lucrative careers than medicine. Furthermore, evidence indicate that female and male physicians are interested in different aspects of medicine (7). In Iran, the desire to work outside the home, and achieving financial independence among women has been shown to be associated with tremendous increase in female students entering universities (11).

The results of this study showed a significant higher academic achievement in female students. Other investigators showed that factors such as gender (12-13), age (14), academic achievement in the earliest grades, parents' education (15) and even family financial status (16) were associated with the academic performance of medical students. On the other hand, some investigators reported that female medical students are as successful as their male colleagues (17). The results of this study contradict the findings of another study performed in Austria. Frischenschlager et al. (12) reported that being male was among factors relevant in predicting academic success. In another study that was performed to investigate

the role of gender on student performance in an obstetrics and gynecology clerkship, it was indicated that female students performed better than their male colleagues on the written examination, the overall Objective Standardized Clinical Examination and its interpersonal skills subsection, and the final clerkship score (13). In a more recent study, Highman and Steer (18) assessed the clinical experience of male and female students in Obstetrics and Gynaecology. They showed that male students had significantly less clinical experience in Obstetrics and Gynaecology, except in relation to scrubbing for caesarean. Male students also performed less well in examinations. On the other hand it has been shown that women graduated from medical schools planned their career more purposefully (7).

Moving to advanced ranks of medicine, a gender difference exists among residents concerning interest in academic medicine. Leonard and Ellsbury (19) showed that third-year female residents had lower interest in academic careers than third-year male residents. They reported that lower interest in leadership and academic careers among female residents may be due to higher role stress among women in training. Roberts et al. (20) performed the first large scale study of medical students' physical and mental health. They reported that women appeared more sensitive to the connection between health and academic vulnerability. Foster-Williams et al. (21) also studied sources of stress among the medical students. Their results showed that there was no statistically significant difference between stress levels by gender.

### Conclusion

Gender imbalance in medical students may lead to serious problems in health care providing system. More research is needed to find ways of attracting male medical students who are being tremendously outnumbered by women. Our results showed that female medical students were more successful than their male colleagues. It seems that the observed differences, are not related to academic intelligence. These

differences may have originated from the decreased motivation in male students for studying efficiently after the enrollment.

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