



## Sex Differences in Promotion of Faculty Members in Shiraz University of Medical Sciences

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### **Abstract**

Despite the increase in the women's employment in universities, especially in medical fields in the recent decades, there is still some evidence indicating the lower number of academically higher rank females, especially in the full professor rank. Therefore, the present study aimed at investigating the gender differences in academic promotions in Shiraz University of Medical Sciences (SUMS). The present study aimed to compare the academic promotion of male and female academic staff in SUMS from 1992 to 2013. The statistical population of this study consisted of all the faculty members working in the faculties and research centers of SUMS. The data were collected through access to their files on the gender, age, school, department, the university where they were educated, and the maximum length of time passed before their promotion. The findings of the study revealed that during the study years about 300 faculty members had promoted to the associate professor rank and 104 members to full professorship rank. The mean of the years passed for promotion to associate professor and professor ranks was 9.97 years ( $M \pm SD = 92$ ) and 6.22 years ( $M \pm SD = 3.32$ ), respectively. The results showed that there was a statistically significant difference in the number of the promoted male and female staff ( $P < 0.01$ ). It was also shown that the length of time passed for promotion and age of promotion to associate professor and professor ranks in both groups of female and male were not significantly different. Finally, according to the results, the length of time for promotion to associate professor rank was significantly different among the clinical and basic sciences faculty members ( $p < 0.01$ ). The results revealed that gender and field of study were influential factors in the academic staff's promotion. Therefore, these differences can be due to gender discrimination or the time allocated to scientific activities of the members.

**Keywords:** *Gender Differences; Academic Promotion; Faculty Members*

## **Introduction**

Nowadays, job well-being, and especially work conditions play an important role in health care staff and doctors-patients well-being (3-1). In general, one of the factors related to the mental and physical health of individuals is their conditions and career progression (4). In this regard, the discrimination against female staff, through creating obstacles to their job promotion, may lead to stresses related to disorders such as burnout, depression or cardiovascular diseases or may create higher chances for the illnesses which consequently will endanger their mental and physical health. Today, in the twenty-first century, gender discrimination is still one of the important issues in the media and academic communities, which has attracted the researchers' attention (6).

As reported in the media and scientific discussions, it is discussed that not only women are less likely to be in the same position with men, but also fewer can step up to higher levels (7). Although over the past fifty years, a significant progress has been made in many countries around the world in reducing gender differences in access to higher education, employment, academic advancement, and improvement in medical care (8, 9). Since 1970 when only 8 percent of the graduates and professors at American College of Medicine were women, this figure has increased to about half of the graduates and 38 percent of the female faculty members (10).

Despite such improvements and increasing access of females to higher education, there are still major gender differences in the general faculty members' ranking, especially in full-time professorships in academic medicine and fewer women have been successful in promoting to a higher academic rank (10, 11). Even in pediatricians with the highest ratio of female residents and faculty members, few women are professors (12). The academic community in Iran has undergone many changes over the past few decades. One of the most important changes is higher education development, one of the implications of which is increase in the women' entry to the universities, in a way that 60% of university accepted students are women, and even the ratio of women in residency entrance exam is more than men (13).

Despite the increasing number of women in academic courses in Iran, only 27% of the faculty members and about 11% of the full professors are female (14). Specifically, in Shiraz University of Medical Sciences, although nearly 42% of the faculty members are woman, only 27% of the full professors are women (15).

Statistics show that in spite of the fact that the ratio of females employed as medical faculty members in primary academic ranks have increased more than twice (16, 17), and that the number of women as the first author in published medical journals has increased (17), the ratio of women in higher academic ranks in medical schools over the past few decades has not changed significantly (16, 17). For example, in 2013, only 21% of full professors, 15% of department heads and 16% of the deans were women (18). Therefore, we can say that the gender imbalance in the rank of full professors is so clear, and the limited research carried out in different countries confirms the issue (9, 19). Yasukawa's report in Japan also suggested that women cover only 2.5% of the deans and 2.6% of the professors at medical faculties (20). In addition to the differences observed in ranking and managerial positions (10, 11), some studies have shown that female doctors receive fewer salaries than men (21-23).

Thus, it can be argued that the increase in the number of women's entry into academic medical courses over the past decades has not been accompanied by equal opportunities for male and female professors in promotion, leadership roles, rights, and interaction with colleagues and supervisors (24). Although several studies have shown this inequality and discussed gender imbalances (7, 10, and 16), little effort has been made to overcome this problem and is even less than conservative predictions (25). In 1985, in the United States, 10 percent of all female professors received full-time professorship (25), which was improved to 12 percent in 2006 (26), while this ratio was 30 percent for men. Thus, if we consider the speed of growth, it will take 20 years to increase the ratio of female professors to 2%.

On this subject, some scholars have mentioned such factors as low productivity and family responsibilities, etc., to explain such differences and gender gaps (16, 27-29); nevertheless, some controlled investigations on some of the variables associated with productivity indicators (number of children, hours of work, productivity, etc.) still prove that women are less likely to be associate professors or professors (8-10, 13, 21). For instance, a recent study of gender differences in the scientific rank of 90,000 physicians as the academic staff at American College of Medicine shows that there is still a trace of gender differences in associate professorships and professorships even when we consider age and other variables (10). Hence, gender differences in rankings cannot be interpreted by productivity indexes (7), and the root of the differences observed can be in gender-related differences.

Vast research is needed to clarify the gender differences in advancement because, firstly, most of the researches on gender differences in academic medicine has used American national data and has focused on certain disciplines (24); secondly, despite the importance and effective role of ranking system in higher education, it has been obviously forgotten in the literature. Thirdly, the research on this subject is limited in Asia and the less developed countries. So far, research in Iran as an Asian and Islamic country on this issue is scanty. Therefore, this research studies the gender differences in faculty members ranking of Shiraz University of Medical Sciences during a twenty-year period.

### **Research Method**

This is a descriptive-analytic and cross-sectional study that has been carried out to investigate and compare the status of scientific promotion of all faculty members, including men and women, in Shiraz University of Medical Sciences from 1371 to 1392. The study research population is all faculty members of educational and research departments and research centers of Shiraz University of Medical Sciences. They are categorized into clinical and educational groups; the clinical departments included ENT, Radiotherapy, Radiology, Orthopedic surgery, Neurology, Pediatric Psychiatry, Internal Medicine, Obstetrics and Gynecology, Physical and Rehabilitation Medicine, Dermatology, Ophthalmology, Anesthesiology, Pathology, Social Medicine; also, Basic Science Educational Groups included Biochemistry, Pharmacology, Parasite and Mycology, Physiology, Medical Physics, Bacteria and Viruses, Anatomy, Biostatistics, Immunology, Nursing, Midwifery, Health, and Epidemics. Academic rankings were divided into assistant professors, associate professors and professors.

Accordingly, all university faculty members who had been promoted during the years from 1371 to 1392 were surveyed in a census manner. For this purpose, the data were collected and counted referring to the files of the faculty members who had been promoted during this period of time. For each faculty member, data such as gender, age, faculty, educational group, college, and minimum and maximum stationary time were extracted to upgrade the academic rank.

### **Ethical Considerations**

In order to collect the data, we firstly obtained a permission letter from the deputy of the university to access the scientific files of the faculty members of Shiraz University of Medical Sciences. To preserve the information, we assigned codes to individual names; then, the information was used based on the assigned codes, generally and without name in analysis.

**Table 1. Promotion of faculty members to associate professors and professors in Shiraz University of Medical Sciences during 1992-1993**

year	To Associated professor	To professor	year	To Associated professor	To professor	year	To Associated professor	To professor
1371	3	1	1378	7	2	1385	14	9
1372	4	0	1379	8	1	1386	36	14
1373	6	3	1380	11	3	1387	34	12
1374	5	0	1381	22	4	1388	16	4
1375	7	1	1382	14	4	1389	13	6
1376	9	1	1383	15	5	1390	19	11
1377	8	2	1384	17	7	1391	32	15

Table 1 shows the trend of academic promotion of faculty members to associated professors in Shiraz University of Medical Sciences during 1371-1391. According to the data, over 300 faculty members have been promoted to associate professorship rank and 104 faculty members were promoted to higher ranks. The maximum number of upgrades to associate professors rank was 36 in 1386 and the maximum number of upgrades to this rank was 15 in 1391.

**Table 2: Frequency and average waiting time for academic promotion and age of promoted faculty members**

	Number	Average	SD	The least	The most
Associated Professorship Waiting Time(year)	300	9.97	4.92	2.92	29.83
Professorship Waiting Time(year)	104	6.22	3.32	4.00	26.58
Associated Professorship Age(year)	300	44.83	5.89	33.55	64.64
Professorship Age(year)	104	49.74	6.09	38.98	70

As shown in Table 2, the mean and standard deviation of the associate professorship waiting time were 9.97 and 4.92, and for professorship, they were 6.22 and 3.32. The mean and standard deviation of the age of associate professors were 44.83 and 5.89, and for the professors they were 49.74 and 6.9.

**Table 3. The relationship between gender and academic promotion**

Gender Academic rank	men		Women		p-value / ( $\chi^2$ )
	frequency	percent	Frequency	percent	
To assistant professor	6	60	4	40	0.001(14.92)
To associate professor	126	54.9	68	45.1	
To professor	89	85.6	15	14.4	

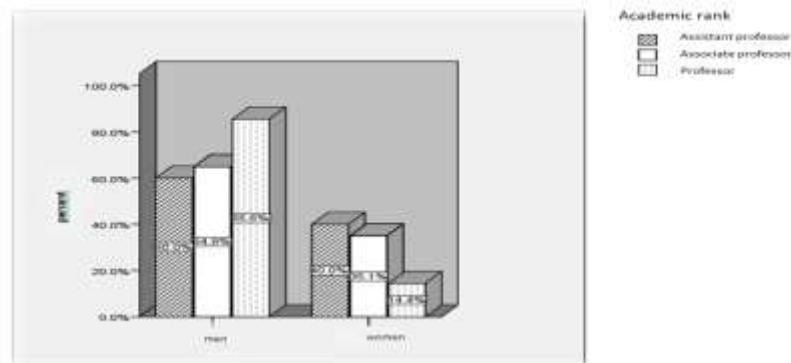
**Diagram 1. Distribution chart of promoted faculty members based on gender and academic rank**

Table 3 presents the distribution of promoted faculty members from 1371-1391 in regard to gender and academic degree at Shiraz University of Medical Sciences. The result of chi-square test showed the relationship between gender and academic promotion was significant ( $X^2=14.92$ ,  $P < 0.001$ ).

**Table 4. Comparison of the faculty members waiting time for promotion based on gender**

Gender variable	men	women	T	p-value
	Mean $\pm$ SD	Mean $\pm$ SD		
Associated professorship waiting time(year)	9.91 $\pm$ 4.78	10.14 $\pm$ 5.29	-0.36	0.72
Professorship waiting time(year)	6.46 $\pm$ 3.52	4.76 $\pm$ 0.82	1.85	0.07
Associated professorship Age(year)	44.71 $\pm$ 5.95	45.14 $\pm$ 5.78	-0.57	0.57
Professorship age(year)	50.02 $\pm$ 6.25	48.06 $\pm$ 4.93	1.16	0.25

The descriptive results show that women have to wait longer than men to be promoted to associated professorship; on the other hand, men wait longer for professorship. Independent t-test results show that there is no significant differences between male and female faculty members regarding to the waiting time and age in promotion to associate professorship or professorship.

**Table 5. The relationship between educational group and academic promotion**

educational group	clinical		Basic		p-value/( $\chi^2$ )
	frequency	percent	frequency	percent	
To assistant professor	1	10	9	90	0.001(19.08)
To associate professor	144	74.2	50	25.8	
To professor	70	67.3	34	32.7	

Diagram 2. Distribution chart of promoted faculty members based on educational group and academic rank

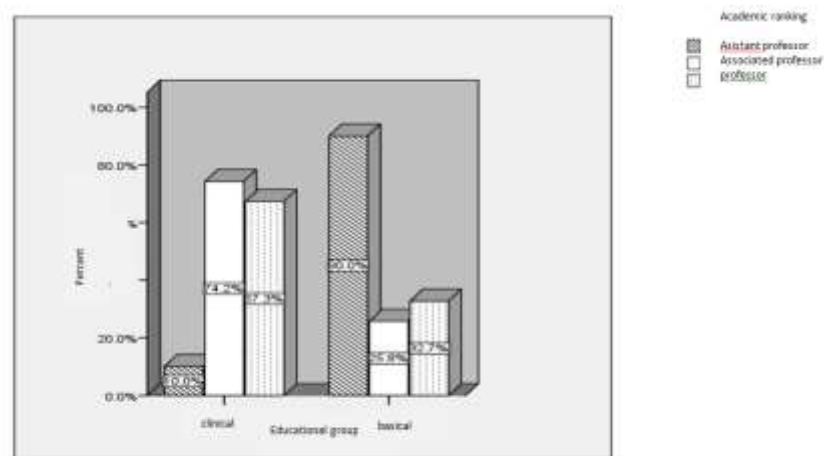


Table 5 shows the frequency of the faculty members in Shiraz University of Medical Sciences during 1992-1391, according to the educational group and academic ranks. The chi-square test was performed and the relationship was found between educational group and the frequency of promotion rate ( $X^2=19.08$ ,  $P < 0.001$ ).

**Table 5. Comparison of the faculty members waiting time for promotion based on educational groups**

educational groups / variable	Clinical	Basic	T	p-value
	Mean $\pm$ SD	Mean $\pm$ SD		
Associated Professorship Waiting Time(year)	11.09 $\pm$ 5.01	7.17 $\pm$ 3.26	6.74	0.01
Professorship Waiting Time (year)	6.39 $\pm$ 2.95	5.84 $\pm$ 4.01	0.80	0.42
Associated Professorship Age (year)	44.69 $\pm$ 5.75	45.18 $\pm$ 6.29	-0.65	0.52
Professorship Age(year)	50.17 $\pm$ 5.92	48.85 $\pm$ 6.45	1.04	0.30

Independent t-test results showed that only associate professorship waiting time was different between the clinical and basic sciences groups ( $p < 0.01$ ). In other words, the results indicated that the mean waiting time for promotion to associate professorship rank in clinical teachers (11.09) was significantly higher than the mean waiting time for basic sciences teachers (7.17).

**Table 6: comparing the waiting time for promotion of the faculty members based on their place of study**

place of study /variable	Domestic universities	Foreign universities	T	p-value
	Mean $\pm$ SD	Mean $\pm$ SD		
Associated Professorship Waiting Time(year)	10.26 $\pm$ 4.82	8.61 $\pm$ 5.19	2.22	0.03
Professorship Waiting Time(year)	5.66 $\pm$ 1.84	7.73 $\pm$ 5.44	-2.91	0.01
Associated Professorship Age(year)	44.44 $\pm$ 5.83	46.67 $\pm$ 5.93	-2.49	0.01
Professorship Age(year)	48.77 $\pm$ 6.00	52.38 $\pm$ 5.65	-2.76	0.01

Independent t-test results showed the average waiting time for promotion to the rank of associate professor for those who studied in the domestic universities was longer than that of those studied in foreign universities ( $p < 0.01$ ). While the average waiting time for promotion to the professorship rank, the mean age of the associate professorship and professorship among those who were educated abroad were longer and higher, respectively ( $p < 0.01$ ).

### **Discussion and Conclusion**

This study was carried out to investigate the status of faculty members' academic promotion in Shiraz University of Medical Sciences during 20 years (1371-91). The authors aimed to discover gender differences in the field of professors' academic promotion, as well as the relationship between the promotion of faculty members based on other variables, such as the study group and place of study. Descriptive results showed that the average waiting time for promotion to the rank of associate professorship was 9.97 and that for professorship was 22.6.

The results showed that there was a significant relationship between gender and academic promotion; in other words, the two groups were significantly different in terms of frequency of those who were promoted, and men had a higher degree of promotion, especially at professorship level. Other results showed that the waiting time and age of promotion to associate professorship and professorship in both groups of male and female were not significantly different.

The result of the study showed differences as to the gender and promotion and the fact that the number of men was more than women was consistent with previous research findings (9-11, 16, 17, 20, 24, 30, and 31).

Elimination of gender differences in promotion from associate professorship to professorship may require a set of distinct strategies (10). However, if there are gender differences in promotion, this

heterogeneity at different levels of the university hierarchy may have roots and reasons. Researchers have provided various explanations for gender differences in academic ranking. One of the most important factors pertinent to gender differences in the academic ranking is the number of publications and their research efficiency which is related to scientific rank directly (7, 8, 16, 27, 28). Blumenthal et al. (2017) concluded that women had fewer publications than men and that's why about twice as many were male full professors (8). Carr et al. also reported that female faculty members with a child had fewer publications than male members (25), but numerous studies have shown that even after their reproductive age, women are still less likely than men to be promoted to professorship (9, 10, 16, 24).

Hence, the following researches focused on gender differences in academic environments and family (8). We divided the differences into internal-individual factors and external-organizational factors. Internal factors are those that originate from individuals, their families and their personal lives, and external factors are those related to the organization and society. Internal factors include family and family commitments (17, 28, 29, 32), and that women have major responsibilities for housework and childcare issues, which require more time (32). This is why female physicians are more likely to experience the conflict between home and work than their male counterparts (33); also, due to family issues, they have less commitment to their profession (9). In Iran, housework and child-care are still considered as one of the main responsibilities of women; that is why women have to allocate part of their working time to other personal responsibilities. Therefore, in medical field women cannot progress as much as men do. Family responsibilities lead to less time allocated to scientific activities, which then causes less effectiveness of their research (9, 34). Another explanation could be childbirth and maternity, which make women to leave work (9); somehow one of the most productive periods for women is labor and related issues. Other innate factors can be the lower self-confidence of women than men in medical contexts; some studies have shown that female residents and students underestimate their abilities more than males (35, 36). The differences in career choices and preferences between women and men can lead to other issues (37-39). Women may devote more time to teaching, counseling and clinical activities than research (16, 29, 40). They often enter clinical pathways, which are upgraded more slowly than research pathways (10). Several factors can be found in relation to external-organizational group that make research efficiency and promotion difficult for women. Some studies have shown that women in medical science require more effort than men to identify effective models and find mentorship (16, 25, 35). Effective mentors play a great role in development and improvement of their mentees and they can be as their model roles; however, the lack of effective mentors and role models for women in medical science can affect their productivity. Other studies have also shown gender differences in access to essential resources for more publications such as networks, teams (41, 42), organization supports (28, 43), resource allocation, and findings (21, 42). Also, apparent gender discrimination in the workplace, unconscious gender bias (44, 45), emergence of manifestations of sexism in the medical environment (46), and low acceptance by senior colleagues (16, 29) can be considered as other effective external factors. These challenges may have adverse effects on research interests, and ultimately explain why, after modifying of research productivity, women are still less likely than males to become professor (7). In addition, there are factors which do not affect the difference in productivity directly, but they may cause differences in job promotion. For instance, one of the conditions for promotion of the faculty members in Shiraz University of Medical Sciences is citations to their studies. In this regard, some studies have shown that there are gender differences in number of professors' citation, so based on documented patterns women are less cited than men systematically, even after controlling factors such as the quality of publications, theoretical view, methodology and organizational affiliation, (47). Besides, teaching quality assessment scores are one of the other conditions to be promoted. Thus, another factor that may affect the women's status is gender bias in student assessment. The results of some studies at Madison's academy in Iran showed that students gave better scores to male professors (48). Also, students tend to underestimate female professors' credibility; they use the term "professor" for male academic staff even if they are just graduated students, while describing female professors as teachers (49). Some also believe that students who receive lower scores from female faculty members tends to enquire more than when they receive

lower scores from male ones (50). Other results showed that there was a significant relationship between the educational group and the academic promotion; in other words, the results of t-test showed that the average waiting time for promotion to the rank of associate professors in clinical group (11.09) was longer than that for associate professor rank in basic sciences (13.7); this difference was significant. Faculty members in basic sciences groups are promoted to the rank of professorship faster than those in clinical groups; this may be attributed to the selection of different jobs. Faculty members in clinical groups have to spend more time in hospitals, which make them less likely than the ones in basic sciences groups to carry out researches efficiently. In Japan, for example, it was found that surgeons in academic hospitals work an average of 1.98 hours per week. Working for nearly 100 hours a week does not actually allow them to do lots of researches (9).

The other results indicated that the average waiting time for promotion to associate professorship of those studying in the country was longer than the average of those studying abroad, while as to that for promotion to professorship, the mean age of the associate professorship and professorship among those who were educated abroad were higher.

### **Limitations**

There were few obstacles in this research. First, we examined only the data for a university that limits the generalizability of the findings. Secondly, considering the design of the study, we were not able to assess the contribution of productivity, the number of children and career choices, and other factors contributing to the gender gap in the promotion of faculties. Our focus was on gender differences in scientific rankings and we did not examine other areas such as leadership roles. Therefore, we need more data in this field to examine the gender gaps in a variety of fields (rank, leadership, etc.) under careful controls. We suggest that future investigations should address the mentioned issues. Despite these limitations, this is the first study in Iran that examines gender differences in academic rankings, and is a primary step that provides a historical perspective on the situation.

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