

Original Article

## Freshmen versus Interns' Specialty Interests

Shima Parsa MD<sup>1</sup>, Azadeh Aghazadeh MD<sup>1</sup>, Ali-Akbar Nejatisafa MD<sup>1,2</sup>, Homayoun Amini MD<sup>1</sup>, Mohammad-Reza Mohammadi MD<sup>1,2</sup>, Babak Mostafazadeh MD<sup>1</sup>, Yasaman Moghaddam MD<sup>1</sup>

### Abstract

**Purpose:** The purpose of this study was to determine career preferences of medical students at the time of entering medical school compared with interns who were graduating; and to determine what factors influence the choice of a special discipline as a career.

**Method:** A cross-sectional, questionnaire-based survey study involving freshmen and interns at Tehran University of Medical Sciences was conducted in 2006 – 2007. Respondents anonymously completed a specialties questionnaire developed by Feifel et al. The questionnaire was translated into Persian (Farsi) and several items were modified based on the circumstances.

**Results:** The response rate was 91 (73%) among freshmen and 137 (77%) among interns. Forty-six freshman students (50%) and 71 interns (51.8%) indicated that they had not developed a strong decision about any particular field of medicine and needed more time. The preferred specialties among freshmen were surgery and internal medicine; whereas graduating students were more interested in "other specialties". There was no significant difference between pediatrics, gynecology, psychiatry, and general practice among the two groups. There was a significant difference in rating when it came to "anticipated income", "prestige" and "helping patients" of which interns were less interested compared to freshmen in these three areas.

**Conclusion:** Approximately one-half of the medical students were unclear about their future goals. The experience of medical school may play a role in diminishing students' interest in surgery and internal medicine as prospective careers.

**Keywords:** career choice, medical specialties, medical students

### Introduction

A number of recent studies have shown the determinants of medical students' specialty preferences. Putative predictors include: demographic variables,<sup>1-3</sup> specialty characteristics,<sup>2-4</sup> institutional characteristics,<sup>5,6</sup> medical school experiences and curricular characteristics,<sup>7-9</sup> lifestyle factors,<sup>2,3,8</sup> and financial is-

sues.<sup>3,10</sup>

Defining the factors that influence career choice at the time of entering medical school is important because it has been demonstrated that career preference at the start of medical school may be a significant predictor of students' eventual career choice.<sup>11-14</sup>

However, a scarcity of research exists on the stability of initial specialty interests during medical education. Medical students may modify their attitudes toward different specialties as they go through medical school.<sup>15,16</sup>

To differentiate determining factors that may be present prior to medical school from those that build up during medical school, it is essential to assess the attitudes of Iranian medical students who are naive of the medical school experience and compare them

**Authors' affiliations:** <sup>1</sup>Department of Psychiatry, Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, <sup>2</sup>Psychiatry and Psychology Research Center, Tehran University of Medical Sciences, Tehran, Iran.

**Corresponding author and reprints:** Homayoun Amini MD, Department of Psychiatry, Roozbeh Hospital, South Kargar Ave., Tehran 1333795914, Iran. Tel: +98-215-541-2222, Fax: +98-215-541-9113, E-mail: aminihoma@yahoo.com

Accepted for publication: 20 May 2010

with those who are completing medical school. The aims of this study were to determine the career preferences of medical students at the time of entering medical school compared with interns who are graduating; and to determine what factors influence choosing a special discipline as a career.

## Materials and Methods

A cross-sectional, questionnaire-based survey study involving freshmen and interns at Tehran University of Medical Sciences was conducted in 2006 – 2007. All 125 new medical students and 178 interns were invited to participate in the study. This study was conducted to assess the attitudes of medical students toward various medical specialties. Respondents anonymously completed a specialty questionnaire which was developed by Feifel et al.<sup>17</sup> In addition, several items and options were added to the North American questionnaire by Malhi et al.<sup>18</sup>; the questionnaire was translated into Persian (Farsi) and several items were modified based on the circumstances. The rating of some questions was reversed but the original instrument was preserved along with its structure.

To establish content validity, the questionnaire was translated into Persian and modified based on the opinions of five experts (four psychiatrists and a clinical psychologist) and was adjusted in terms of social and cultural circumstances. In order to verify the reliability, the questionnaire was distributed to 40 students and was administered again after two weeks. Cronbach's alpha was 0.612 to 0.948 for the different items.

The questionnaire explored the following five areas:

1) demographic backgrounds, 2) factors the students considered important in their choice of a specialty, 3) the degree to which students considered possible careers among various specialties (general practice, internal medicine, pediatrics, surgery, obstetrics/gynecology, and psychiatry), 4) the extent to which students found various specialties attractive enough to build a career on, and 5) students' estimates of the degree to which others respected the skills of physicians in various specialties.

Most items 2 to 5 were of a five-point Likert scale format. Attractiveness ratings ranged from 5 (very attractive) to 1 (extremely unattractive); therefore,

higher mean scores represented higher attractiveness.

The Statistical Package for Social Sciences Software (SPSS) was used for data analysis. Differences in means were analyzed using the independent sample *t*-test. Differences in proportions were analyzed using the Chi-square test. In analyses, the five-point attractiveness ratings for each specialty were treated as continuous data and analyzed with linear multivariate regression, Enter method to determine the association of choosing each specialty with the factors students regarded as important. A *P* value of less than 0.05 was considered statistically significant.

## Results

The response rate was 91 (73%) among freshmen and 137 (77%) among interns. The mean age of the freshmen and interns was 19.57 and 27.34 years, respectively; 48 (52.7%) freshman students and 88 (62.2%) interns were female.

### Choosing prospective career and specialty preferences

The degree to which freshman medical students considered various specialties as prospective career options are as follows: 46 freshman students (50%) indicated that they had not developed a strong decision and needed more time to choose their desired specialty; 16 (17.4%) chose surgery as their prospective career; 9 (9.8%) opted for internal medicine; 6 (6.5%) chose psychiatry; 5 (5.4%) chose pediatrics; 5 (5.4%) opted for gynecology; and only 1 (1.1%) chose general practice. Seventy-one interns (51.8%) indicated that they had not yet decided their specialty; 33 (24.1%) chose "other specialties"; 18 (13.1%) chose surgery; 5 (3.6%) chose psychiatry; 4 (2.9%) opted for internal medicine; 3 (2.2%) chose gynecology; and 3 (2.2%) chose pediatrics as their prospective careers and no one chose general practice (Figure 1). As illustrated in Table 1, the most favored specialties among freshman students were surgery and internal medicine; whereas graduating students were more interested in "other specialties". There was no significant difference in pediatrics, gynecology, psychiatry, and general practice between the two groups.

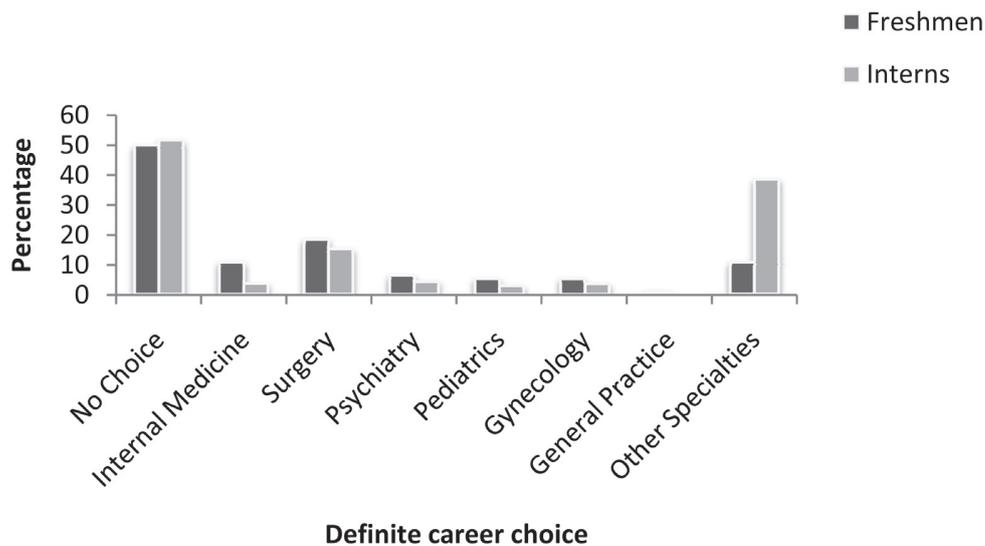


Figure 1. Definite career choice in freshman students and interns

Table 1. The degree to which students were considering possible careers among various medical specialties

Specialty	Students	Freshmen (mean±SE)	Interns (mean±SE)	P value
Internal medicine		2.94±1.10	2.14±1.06	<0.001
Surgery		3.41±1.13	2.70±1.35	<0.001
Psychiatry		2.24±1.18	2.10±1.12	0.36
Pediatrics		2.27±1.15	1.99±1.04	0.70
Gynecology		1.80±1.17	1.89±1.17	0.58
General practice		1.55±0.85	1.53± 0.85	0.87
Other specialties		3.10±1.19	4.15±1.04	<0.001

**Factors that influence specialty preferences**

Students’ responses are summarized in Table 2. Although both groups marked all the factors as important, there was a significant difference in rating

with “anticipated income”, “prestige”, and “helping patients”. Interns had less interest in these three areas compared with freshman students.

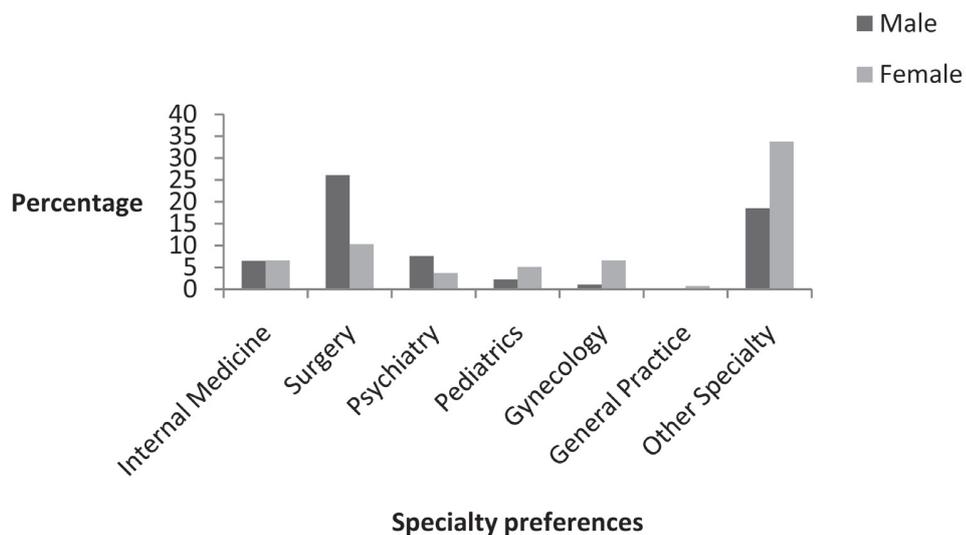
Table 2. Factors freshman students and interns considered important in their choice of a specialty

Factors	Students	Freshmen (mean±SE)	Interns (mean±SE)	P-Value
Financial reward		4.40±0.72	3.98±0.81	<0.001
Lifestyle		4.56±0.60	4.38±0.81	0.53
Interesting/challenging work		4.14±1.06	4.01±1.00	0.38
Prestige		4.32±0.81	3.71±0.93	<0.001
Ability to help people		4.45±0.66	4.04±0.96	<0.001
Intellectual challenge		4.41 ± 0.67	4.25 ± 0.92	0.16

**Table 3.** Association of career choice with regard to the importance of the aspects of each specialty and medical school experience

Career choice	Internal medicine		Surgery		Psychiatry		Pediatrics		Gynecology		General practice		Others	
	Beta	P-value	Beta	P-value	Beta	P-value	Beta	P-value	Beta	P-value	Beta	P-value	Beta	P-value
Medical school experience	-0.39	0.000*	-0.17	0.009*	0.01	0.891	-0.14	0.055	0.03	0.663	-0.12	0.098	0.37	0.000*
Gender	-0.02	0.768	-0.21	0.001*	-0.12	0.099	0.13	0.078	0.43	0.000*	0.09	0.213	0.16	0.050
Financial reward	-0.04	0.518	-0.26	0.000*	0.11	0.128	0.15	0.035*	0.001	0.992	0.14	0.053	0.12	0.126
Lifestyle	-0.10	0.169	0.19	0.006*	-0.02	0.823	-0.17	0.025*	0.26	0.000*	-0.14	0.070	0.04	0.588
Prestige	-0.03	0.639	0.11	0.120	0.01	0.863	-0.04	0.631	-0.08	0.278	-0.10	0.179	-0.06	0.481
Interesting/challenging work	-0.05	0.541	0.09	0.184	0.07	0.366	-0.18	0.016*	-0.15	0.043*	-0.03	0.667	0.02	0.798
Ability to help people	0.07	0.370	-0.04	0.569	-0.21	0.012*	0.05	0.508	0.08	0.303	0.12	0.148	-0.10	0.255
Based on scientific foundation	0.11	0.141	0.16	0.018*	0.21	0.012*	0.11	0.138	0.08	0.278	-0.24	0.003*	-0.22	0.008*

\* Significant



**Figure 2.** Specialty preferences in terms of gender

Based on the ratings of the degree to which the students considered possible careers about the importance of the aspects of each specialty and medical school experience, we used linear multivariate regression, Enter method to determine whether these

career choices were associated with the attractive aspects of each specialty and the medical school experience (Table 3).

The medical school experience showed a significant negative association with the choices of internal med-

icine and surgery, and a significant positive association with “other specialties” as prospective careers. “Ability to help people” was not associated with any of the specialties, except for psychiatry, and “prestige” was not associated with choosing any specialty (Table 3).

Gender-based specialty preferences among medical students are shown in Figure 2. There was a significant negative correlation between female gender and surgery, and a positive correlation between female gender and gynecology. The most favored specialties among female students were obstetrics and gynecology followed by pediatrics, internal medicine and “other specialties”. In fact, they showed little interest in surgery.

## Discussion

Several interesting findings emerged. Approximately one-half of the medical students were unclear about their future career plans. Few medical students wanted to be general physicians. Some specialties were more attractive for female students. Freshmen were more interested in internal medicine and general surgery while interns were interested in other specialties.

Fifty percent of the freshmen and 51.8% of interns were unable to make a definite decision about a specific specialty. This situation is expectable to some extent for freshmen, as they may have limited information about medical specialties. This, however, may reflect a kind of career indecision in Iranian medical interns. Career indecision has been an important concern for practitioners, researchers, and educators.<sup>19</sup> Interpersonal and contextual factors, adherence to cultural values such as collectivism or individualism, in addition to family role and educational system can influence individuals' career behaviors.<sup>20-22</sup> The lack of vocational counseling systems in Iranian medical universities may also have a role in the phenomenon of career indecision among graduating medical students.

A lack of desire among medical students to choose general practice as a career was another important finding that should be considered. In other countries, namely Canada, the number of medical students choosing family medicine as a career option is declining.<sup>11</sup> The increased number of medical students not choosing general practice as their future career

accompanied with population growth and ageing in addition to the retirement of physicians can be translated into an increased demand for the services provided by general practitioners.<sup>23</sup>

Factors associated with choosing general practice include: medical school characteristics,<sup>11,24</sup> personal interactions,<sup>25,26</sup> lifestyle preferences, and personal fitness; workforce factors, which include expected income, prestige, job opportunities, longitudinal care, societal need and the availability of role models.<sup>7,27</sup> In recent years, medical education has experienced considerable changes at Tehran University of Medical Sciences. In most university hospitals, the residency and fellowship programs are overstressed while the general medicine programs are neglected. These changes may affect the perception and awareness of medical students about general practice.<sup>28</sup>

More female students preferred obstetrics and gynecology to males. Others<sup>29-31</sup> reported gender differences in specialty preferences. The inability of male students to continue their education in obstetrics-gynecology as a specialty according to the current law in Iran, and probably a kind of traditional female bias towards this specialty may explain the trend towards this career.

Freshmen preferred to choose internal medicine and surgery; however, this interest declined significantly among the interns. In other words, the experience of medical school may have played a role in diminishing student interest in surgery and internal medicine as prospective careers. Babbott and colleagues have surveyed medical students in some universities in the U.S. and found that the most favored specialties among freshmen were internal medicine, pediatrics, and family medicine. Nevertheless, this preference declined as they finished medical school and shifted to pathology, ophthalmology, and radiology; these findings were consistent with our survey.<sup>32</sup> This decline in interest in internal medicine and surgery is multi-factorial. Lifestyle issues, income and family considerations have become progressively more important to the new generation of students and may partly explain this decline.<sup>33</sup>

In comparison of factors that influence specialty preferences between the present study and Zarghami et al., a study that was performed approximately ten years ago, it seems that life style aspects were more important for participants in the present study

than general physicians that had participated in the Zarghami et al. study.<sup>31</sup> Apart from methodological differences between the two studies, this finding may be attributed to a cohort effect that may reflect a kind of attitude change in the new generation.

Ratings of the aspects students were considering for their choice of specialty were higher among junior students in comparison with seniors particularly for “anticipated income”, “prestige”, and “helping patients”. Even though this decline may reflect a more realistic view of future situations, it may alternatively show the negative effects of exposure to clinical experience or discouragement by peers, previous graduates, and educators.

Given the results of the study, we would recommend that the educational system of Tehran University of Medical Sciences, professionals and undergraduate medical educators provide balanced, unbiased information to students in an effort to allow them to make more informed career decisions during both preclinical and clinical training.

This study had some limitations. Only one medical school participated in this study and the results, therefore, may not be representative of students in other Iranian medical schools. There may have been other important factors, which were attributed to specialty choices not included in this survey. The high rate of choosing an undetermined item, namely “other specialty” as a specialty choice was another limitation that should have been stated. This study was cross-sectional and covered only freshmen and graduating students of one year. There may be year-to-year fluctuations in the number and percent of medical students choosing different specialties, and attitude change may occur with time. Some observed differences among freshmen and interns may be attributed solely to the cohort effect. Further studies with a cohort design over a longer period of time, more students and the inclusion of graduates would clearly be beneficial.

### Acknowledgment

*This study was supported by a grant from Tehran University of Medical Sciences, Tehran, Iran.*

### References

1. Pamies RJ, Lawrence LE, Helm EG, Strayhorn G. The effects of certain student and institutional characteristics on minority medical student specialty choice. *J Natl Med Assoc.* 1994; **86**: 136 – 140.
2. Barshes NR, Vavra AK, Miller A, Brunnicardi FC, Goss JA, Sweeney JF. General surgery as a career: a contemporary review of factors central to medical student specialty choice. *J Am Coll Surg.* 2004; **199**: 792 – 799.
3. Newton DA, Grayson MS, Whitley TW. What predicts medical student career choice? *J Gen Intern Med.* 1998; **13**: 200 – 203.
4. Kassebaum DG, Szenas PL. Factors influencing the specialty choices of 1993 medical school graduates. *Acad Med.* 1994; **69**: 164 – 170.
5. Sierles FS, Dinwiddie SH, Patroi D, Atre-Vaidya N, Schrifft MJ, Woodard JL. Factors affecting medical student career choice of psychiatry from 1999 to 2001. *Acad Psychiatry.* 2003; **27**: 260 – 268.
6. Weissman SH, Haynes RA, Killian CD, Robnowitz C. A model to determine the influence of medical school on students' career choices: psychiatry, a case study. *Acad Med.* 1994; **69**: 58 – 59.
7. Rosenthal MP, Diamond JJ, Rabinowitz HK, Bauer LC, Jones RL, Kears GW, et al. Influence of income, hours worked, and loan repayment on medical students' decision to pursue a primary care career. *JAMA.* 1994; **271**: 914 – 917.
8. Cochran A, Melby S, Neumayer LA. An internet-based survey of factors influencing medical student selection of a general surgery career. *Am J Surg.* 2005; **189**: 742 – 746.
9. Sanfey HA, Saalwachter-Schulman A, Nyhof-Young JM, Eidelson B, Mann BD. Influences on medical student career choice: gender or generation? *Arch Surg.* 2006; **141**: 1086 – 1094.
10. Ruhnke G. Physician supply and the shifting paradigm of medical student choice. *JAMA.* 1997; **277**: 70 – 71.
11. Senf JH, Campos-Outcalt D, Watkins AJ, Bastacky S, Killian C. A systematic analysis of how medical school characteristics relate to graduates' choices of primary care specialties. *Acad Med.* 1997; **72**: 524 – 533.
12. Carline JD, Greer T. Comparing physicians' specialty interests upon entering medical school with their eventual practice specialties. *Acad Med.* 1991; **66**: 44 – 46.
13. Zeldow PB, Preston RC, Daugherty SR. The decision to enter a medical specialty: timing and stability. *Med Educ.* 1992; **26**: 327 – 332.
14. Pathman D. Medical education and physicians' career choices: are we taking credit beyond our due? *Acad Med.* 1996; **71**: 963 – 968.

15. Sierles FS, Taylor MA. Decline of U.S. medical student career choice of psychiatry and what to do about it. *Am J Psychiatry*. 1995; **152**: 1416 – 1426.
16. Lee EK, Kaltreider N, Crouch J. Pilot study of current factors influencing the choice of psychiatry as a specialty. *Am J Psychiatry*. 1995; **152**: 1066 – 1069.
17. Feifel D, Moutier CY, Swerdlow NR. Attitudes toward psychiatry as a prospective career among students entering medical school. *Am J Psychiatry*. 1999; **156**: 1397 – 1402.
18. Malhi GS, Parker GB, Parker K, Carr VJ, Kirkby KC, Yellowlees P, et al. Attitudes toward psychiatry among students entering medical school. *Acta Psychiatr Scand*. 2003; **107**: 424 – 429.
19. Gaffner D, Hazler R. Factors related to indecisiveness and career indecision in undecided college students. *J Coll Stud Dev*. 2002; **43**: 317 – 326.
20. Corkin D, Arbona C, Coleman N, Ramirez R. Dimensions of career indecision among Puerto Rican college students. *J Coll Stud Dev*. 2008; **49**: 81 – 94.
21. Kinnier R, Brigman L, Noble F. Career indecision and family enmeshment. *J Couns Dev*. 1990; **68**: 309 – 312.
22. Nedjat S, Emami-Razavi H, Rashidian A, Yazdani S, Majdzadeh S. Factors associated with choosing medical school among students of Tehran Faculty of Medicine and their awareness about future of their career: a qualitative-quantitative approach. *Steps Dev Med Edu*. 2006; **3**: 1 – 10.
23. Sullivan M. Why are fewer medical students choosing family medicine as a career choice? Canada: Atlantic Regional Training Center; 2006. Available from: URL: <http://www.artc-hsr.ca/Document%20linked20%tothesis20%summary20%Melissa%20Sullivan.pdf>. 2010/09/30.
24. Meurer LN. Influence of medical school curriculum on primary care specialty choice: analysis and synthesis of the literature. *Acad Med*. 1995; **70**: 388 – 397.
25. Connelly MT, Sullivan AM, Peters AS, Clark-Chiarelli N, Zotov N, Martin N, et al. Variation in predictors of primary care career choice by year and stage of training. *J Gen Intern Med*. 2003; **18**: 159 – 169.
26. Steiner E, Stoken JM. Overcoming barriers to generalism in medicine: the residents' perspective. *Acad Med*. 1995; **70(suppl 1)**: S89 – S94.
27. Bland CJ, Meurer LN, Maldonado G. Determinants of primary care specialty choice: a non-statistical meta-analysis of the literature. *Acad Med*. 1995; **70**: 620 – 641.
28. Emami Razavi SH, Meshkani Z, Mirzazadeh A. A qualitative study of challenges in undergraduate medical education program of Tehran University of Medical Sciences. Fourth Asia Pacific Medical Education Conference (APMEC); Singapore National University of Singapore; 2007: 11 – 18.
29. Khader Y, Al-Zoubi D, Amarin Z, Alkafagei A, Khasawneh M, Burgan S, et al. Factors affecting medical students in formulating their specialty preferences in Jordan. *BMC medical Education*. 2008; **8**: 32.
30. Maiorova T, Stevens F, Scherpbier A, van der Zee J. The impact of clerkships on students' specialty preferences: what do undergraduates learn for their profession? *Med Educ*. 2008; **42**: 554 – 562.
31. Zarghami M, Ghafari-Saravi V, Khalilian A, Sefid Chian A. Factors influence speciality choice among graduated medical students. *J Babol Univ Med Sci*. 2003; **2**: 18 – 23.
32. Babbott D, Baldwin DC Jr., Killian CD, Weaver SO. Trends in evolution of specialty choice. Comparison of US medical school graduates in 1983 and 1987. *JAMA*. 1989; **261**: 2367 – 2373.
33. Azizzadeh A, McCollum CH, Miller CC 3rd, Holliday KM, Shilstone HC, Lucci A Jr. Factors influencing career choice among medical students interested in surgery. *Curr Surg*. 2003; **60**: 210 – 213.