

## Specialty Selection and Relative Job Satisfaction of Family Physicians and Medical Specialists in Austria

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**Aim** To estimate the relative job satisfaction of Austrian family physicians and other specialists with respect to whether or not they obtained training in the desired specialty.

**Methods** In this cross-sectional study, we re-examined the previous data on allocation of medical training posts in Austria. All board-certified physicians practicing in Vienna were surveyed with a 12-item questionnaire. We analyzed the association between respondents' desired and practiced medical specialty and their answer to the question of whether they thought they would have had greater job satisfaction in a different medical specialty. We also calculated their relative job satisfaction.

**Results** Of 8127 licensed physicians, 2736 (34%) completed the questionnaire in two mailings. Of physicians who completed the questionnaire, 50.3% (43.2% of men) did not obtain the training in their desired specialty and 65.1% stated that they had originally desired a different specialty. There was a significant difference in relative job satisfaction between specialists who got their desired medical specialty ( $n = 1005$ ) and those who did not ( $n = 697$ ) (0.95 vs 0.62 of maximum 1,  $P < 0.001$ ). No significant difference in relative job satisfaction was found between family physicians who had originally wanted to become specialists ( $n = 679$ ) and specialists who had originally wanted to become family physicians ( $n = 533$ ; 0.89 vs 0.81;  $P = 0.01$ ;  $\chi^2$  test).

**Conclusion** A high percentage of family physicians in Austria had originally wanted to become practitioners of a different specialty. Among physicians who did not receive training in their desired medical specialty, family physicians showed a significantly higher relative job satisfaction than specialists. Obtaining the desired medical specialty is a strong predictor of relative job satisfaction among specialists, but not among family physicians.

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> **Received:** December 2, 2007

> **Accepted:** March 25, 2008

> **Croat Med J. 2008;49:375-83**

> doi: 10.3325/cmj.2008.3.375

A number of framework conditions for the work of family physicians in Austria and in other European health systems (1,2) are still not well defined.

In Austria, it is not clear what services have to be provided in primary care and when patients should be referred to a specialist. Due to the non-remuneration for some services and procedures, the spectrum of care generally provided by family physicians is limited. Specialists can be consulted not only in hospital outpatient departments, but also in private offices under contract with the national health insurance board. Patients have a more or less free choice to consult a family physician, one or more self-employed specialists under contract with the national health insurance board, or specialists in hospital outpatient departments.

There are many self-employed specialists, especially in larger cities like Vienna (3). As family physicians in Austria often fail to play the role of gatekeepers, private practice specialists frequently see patients with complaints that, in a well-defined primary care system, would be treated by family physicians. This situation creates a competitive relationship between family physicians and private practice specialists.

Academic family medicine in Austria is still underdeveloped in comparison with other countries in Europe with more advanced health care systems (4). It is also not recognized as a medical specialty, which is reflected in the quality and duration of training and many other aspects. Even within the medical profession, there is sometimes little understanding for the competencies and skills of family physicians and the possible benefits of a well-defined primary care system (5,6). As has been widely discussed, the quality of vocational training for both family medicine and various specialties is often far from satisfactory (7-10).

The European Academy of Teachers in General Practice considers it essential that the

right career opportunities be given to right candidates (11). However, there is a question of whether the candidates who are particularly interested in and suitable for family medicine end up practicing that discipline. If residency programs were designed to impart the knowledge, skills, and attitudes needed to care for patients with chronic diseases, students and interns who were genuinely interested in providing high-quality ambulatory care would recognize the exciting opportunities offered within primary care (12). The graduates who are likely to acquire the competencies needed for family medicine (13) should be given a chance to become family physicians.

The aim of this study was to determine if family physicians had originally desired to work as family physicians and if the relative job satisfaction of family physicians and other medical specialists depended on whether they obtained their training in desired medical specialty.

## Methods

We re-examined the data of our previous survey on allocation of medical training positions in Austria (14). All board-certified physicians (family physicians and specialists) in the register of the Viennese Medical Chamber were surveyed with a self-administered 12-item questionnaire (web extra material). After a field trial, the questionnaire was mailed to physicians together with a letter from the president of the Viennese Medical Chamber who explained the purpose of the study. The questionnaires were returned by facsimile or mail. There were 7 questions regarding the course of postgraduate medical education and 5 on demographic data. We analyzed the answers to the following questions: "Which specialty did you aspire to after finishing medical school?"; "In which specialty are you practicing now?"; "In addition to the specialty you are practicing

now, did you complete a training in any other specialty?"; "How many months did you spend in training over and above the prescribed training period for the specialty in which you are practicing now?"; and "Do you think you would have had greater job satisfaction if you practiced in a different medical specialty than the one in which you are practicing now?"

To reach physicians who did not reply to the questionnaire, we mailed it again to all physicians, with a note that it should be completed only by those who omitted to do it the first time. To identify physicians who had already answered the first mailing, a new question was added referring to the first mailing. A small number of non-respondents were then identified and interviewed face-to-face to estimate any possible respondent bias.

#### **Study population**

All board-certified physicians practicing in Vienna ( $n = 8127$ ) were included in the survey (family physicians and specialists, excluding dentists). According to the register of the Viennese Medical Chamber, 2811 were family physicians (34.6%). Of them, 1281 worked in their own offices, almost all run single-handedly; 1209 were hospital-employed; and 321 were retired, but licensed to practice at home. Of 9 provinces in Austria, the Vienna province is the most populated and has the greatest number of physicians, ie, 27% of 30 509 physicians in Austria.

#### **Outcome measures**

Physicians were asked whether they thought they would have had greater job satisfaction if they practiced in a different medical specialty. Relative job satisfaction was calculated for each group of physicians. It was measured by assigning the value 1 to the answer "no" and the value 0 to the answer "yes." From these data, the mean was calculated for each group of physicians. With respect to the allocation

system, our point of departure was that a good system should allow as many graduates as possible to obtain training in their desired medical specialty.

#### **Statistical analysis**

The data were analyzed using frequency tables, univariate tables, and contingency tables. When appropriate, the  $\chi^2$  and Mantel-Haenszel tests were used. Statistical significance was set at 0.05. Statistical analyses were performed with a computerized program based on an Oracle 9i database, (Oracle Corporation, Redwood Shores, CA, USA).

#### **Results**

The physicians returned 2736 questionnaires in response to two mailings (overall response rate, 34%). Of these, 166 questionnaires were invalid. Valid questionnaires were received from 547 (19.5%) family physicians in the first mailing and 277 (9.9%) in the second one.

#### **Socio-demographic data**

Female-to-male ratio of physicians was 1:1.48, but more questionnaires were returned by female physicians. However,  $\chi^2$  test showed no significant difference in the response rate between female and male physicians ( $P = 0.184$ ). There were 9.0% respondents aged <35 years, 66% aged 35-55 years, and 25% older than 55 years. Of those who did not obtain training in their desired medical specialty, 51.6% were in the age group 35-55 years and 45.6% in the age group >55 years. Twenty-five percent of the respondents had no children, 21% had one child, and 54% had more than one child. There were 90.7% respondents of Austrian nationality at birth.

#### **Relative job satisfaction**

There were no significant differences between the physicians who responded to the first and

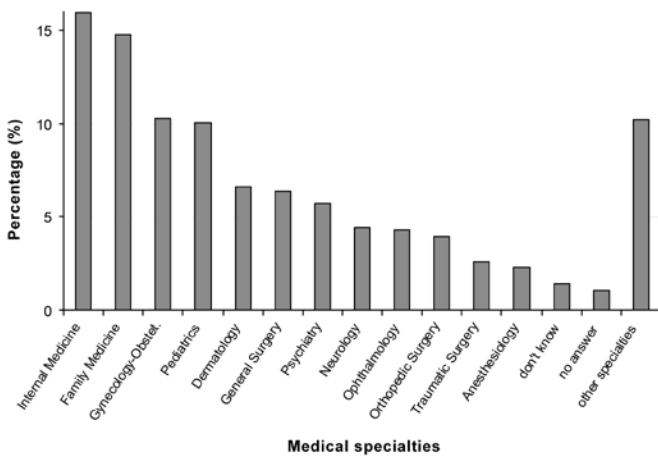


Figure 1. Popularity of specialties (%) according to respondents' desired medical specialties, Vienna, Austria.

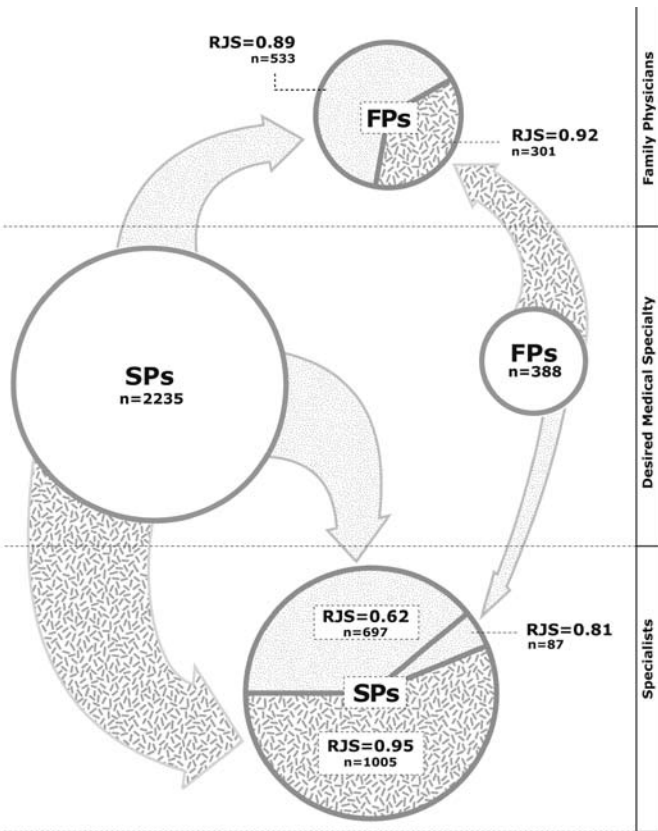


Figure 2. Dynamics of desired and practiced specialties. The size of the circles in the middle section relates to the number of graduates who wanted to become either specialists in a particular specialty (left) or family physicians (right). The upper circle represents the physicians who had become family physicians, either in accordance with their originally desired medical specialty (DMS) (right upward directed arrow) or not (left upward directed arrow). The lower circle represents the physicians who became specialists (big arrow left represents physicians who have attained their DMS, the arrow in the middle represents physicians who have not attained their DMS, and the arrow on the right represents specialists who had originally wanted to become FPs). RJS – relative job satisfaction; SPs – specialists.

second mailing in age and professional status (eg, self-employed/employed = 60/40%, except for the self-perceived reasons for not getting the desired medical specialty ( $\chi^2$ ;  $P < 0.001$ ), the specialty that was being practiced ( $P = 0.006$ ), and whether a second specialty training was received ( $P = 0.002$ ). Of 50 non-respondents who were personally interviewed, 26 (52%) stated that they were not able to obtain the training in their specialty of preference. Various reasons were given for not responding to either of the mailings, such as “I had no incentive to respond;” “I had no time to answer the questionnaire;” “I don’t remember having received the questionnaire;” or “The facsimile transmission of the questionnaire failed.”

Figure 1 shows the combined answers of female and male respondents to the question “Which specialty did you aspire to after finishing medical school?”. There were 15.9% of male and 13.6% of female physicians who originally wanted to become family physicians. Family medicine was the third most frequently desired medical specialty among female physicians, after pediatrics as the first (15.5%) and internal medicine as the second choice (14.6%), and the second among male physicians, after internal medicine as the first (16.9%) and before gynecology and obstetrics as the third most frequent choice (9.2%).

There were 50.3% of physicians (43.2%, of all male physicians and 58.6% of all female physicians) who did not get the desired specialty. Of 2235 respondents who wanted to become specialists, 1005 (45.0%) received the training in their desired medical specialty (Figure 2). Of 388 respondents who wanted to become family physicians, 301 (77.6%) received the desired training. Specialists who obtained the training in their desired medical specialty had significantly higher relative job satisfaction (0.95) than those who did not ( $n = 697$ ; 0.62) ( $\chi^2$  test,  $P < 0.001$ ). Family physicians who had origi-

nally aspired to family medicine also had high relative job satisfaction (0.92). However, the difference in relative job satisfaction between the latter group of family physicians and their peers who had originally wanted to become specialists (n=533) was not significant ( $\chi^2$ ,  $P=0.161$ ). The difference in relative job satisfaction between the family physicians who had originally desired a specialty other than family medicine (relative job satisfaction=0.89) and the specialists who had originally wanted to become family physicians (relative job satisfaction=0.81) was not significant. However, there was a significant difference between the two groups of physicians who wanted to become specialists but did not obtain their desired medical specialty ( $\chi^2$ ,  $P<0.001$ ); some of them became practitioners of a specialty other than family medicine (n=679, relative job satisfaction=0.62), while others became family physicians (n=533, relative job satisfaction=0.89). The difference in relative job satisfaction between the specialists who obtained their desired medical specialty and the family physicians whose desired medical specialty was family medicine was not significant.

There were 65.1% of family physicians who stated that they had originally aspired to a different specialty. Figure 3 shows the percentages of answers to the question “Do you think you would have had greater job satisfaction in a different medical specialty than in the one you are now practicing?”

Of all 1293 physicians who did not receive training in their desired medical specialty (50.3%), 117 (9%) had changed their mind concerning their desired medical specialties during the course of their training and 540 physicians (21% of the physicians surveyed) completed the training in an additional specialty. Of these, 92 physicians (17% of all physicians with an additional specialty) completed the training in an additional clinical or non-clinical specialty and 448 physicians (83%) fin-

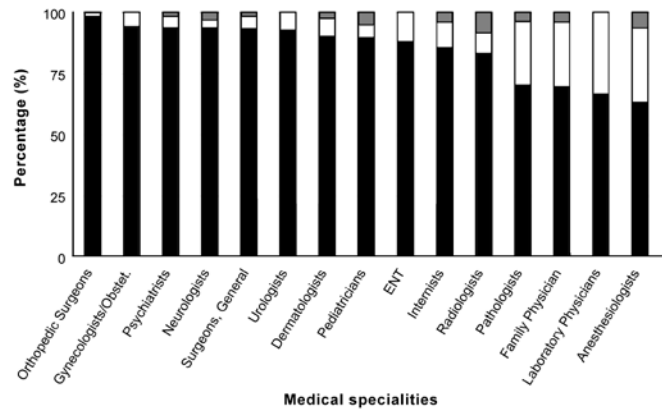


Figure 3. Percentages of physicians' answers per specialty to the question “Do you think that you would have had a greater job satisfaction in a different medical specialty than in the one currently practiced? Closed bars – satisfaction with the specialty; open bars – greater satisfaction with the specialty; gray bars – no answer.

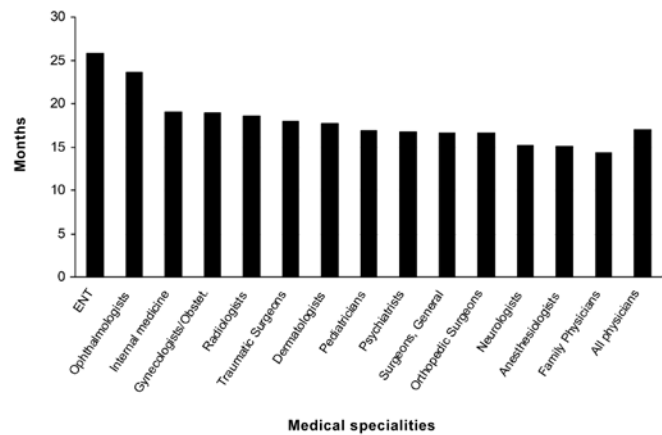


Figure 4. Average number of additional months spent in training per specialty practiced (only specialties for which the response rate was at least 2% are shown).

ished the training for family medicine. In addition to the training period for the practiced specialty, physicians reported an average of 17 months (family physicians, 14 months) spent on their official training positions (Figure 4). Even if we exclude the additional months spent by those physicians who had completed training in an additional specialty, we still have an average of 11 months spent on a training position Austrian legislation which stipulates vocational training.

**Discussion**

Our study showed that many family physicians thought that they would have had great-

er job satisfaction in a different specialty and that a high percentage of family physicians had originally aspired to become specialists. The percentage of family physicians who had wanted to become practitioners of a different specialty was considerably higher than that in the overall group and was surpassed only by ENT specialists. More than 4 of 5 physicians whose desired medical specialty was family medicine specialized in that field (14). It must be kept in mind that the number of physicians whose desired medical specialty was family medicine differs from the number of physicians whose desired medical specialty was family medicine and who specialized in it.

Family physicians whose desired medical specialty was family medicine displayed quite a high relative job satisfaction, surpassed only by those specialists who attained their desired medical specialty (non-significant difference). However, those physicians who had aspired to one specialty but specialized in another (excluding family medicine) had the lowest relative job satisfaction. How can we explain the phenomenon that relative job satisfaction of the "second-choice" family physicians was significantly higher than that of the "second-choice" specialists? One possible answer could be that family medicine as a "second-choice option" provides, in general, better opportunities or greater professional satisfaction than many "second-choice" specialties.

We found that the relative job satisfaction of physicians who had originally wanted to become family physicians but ended up as specialists is high, compared with the relative job satisfaction of physicians who ended up as specialists in a specialty other than the one to which they aspired. We believe that medical students or graduates interested in family medicine were more likely to adjust to a new career. This is supported by the findings by Merrill et al (15-17) that summary scores on attitudinal inventories measuring authori-

tarianism, Machiavellianism, reliance on high technology, negative orientation to patients with psychological problems, and intolerance of ambiguity were lower for senior students entering primary care.

The relative job satisfaction of physicians who attained their desired medical specialty was high in comparison with the relative job satisfaction of the physicians who did not attain their desired medical specialty. Our data indicate that the attainment of one's desired medical specialty is a strong predictor of relative job satisfaction for specialists, but not for family physicians.

When we considered the physicians who obtained their desired medical specialty, as shown in our previous study (14), the percentage of physicians who had desired major specialties (eg, internal medicine and surgical specialties) was higher than the percentage of practitioners who had desired family medicine. Accordingly, there was generally a high relative job satisfaction in these specialties. We can thus conclude that there is an unfavorable selection of graduates for training in family medicine in Austria.

Although family medicine is one of the most favored medical disciplines in Austria, there is no competition for training in family medicine once the specialty training has started. This is because, in most government- or community-based hospitals, it is common for medical trainees to start their graduate education with a three-year period of training as generalists, irrespective of whether or not they want to become family physicians.

It is known that physicians with a lower job satisfaction show a higher tendency to develop depressive and anxiety disorders or burn-out syndrome (18,19). A German study found that physicians showed distinct psychosocial strain patterns (20). According to our data, specialist physicians thought that they would have had a greater job satisfaction in a differ-

ent medical specialty. This lower relative job satisfaction could be seen as an additional psychosocial stress factor. Our study did not measure health of surveyed physicians or health outcomes of their patients. Consequently, we cannot judge whether a lower relative job satisfaction has indirect effects on physicians' health or the professional performance of physicians in our population. However, it has been shown that patients with pain or depressive symptoms treated by primary care physicians with a higher job satisfaction are more satisfied with the quality of care than those treated by physicians with a lower job satisfaction (21). In view of the importance of the role played by family physicians in the health system, the high burden of burnout in family physicians (22) and lower relative job satisfaction of the large group of family physicians who had originally aspired to be specialists, we can assume that the unsatisfactory specialty allocation procedures could have negative implications for patient-rated quality of care.

This is the first study assessing relative job satisfaction of Austrian physicians depending on whether they received the training in their desired specialty. However, a bias resulting from the fact that only 34% of physicians responded to our survey and that the response rate per specialty varied between 43.4% (ophthalmologists) and 27.2% (traumatic surgeons) cannot be excluded. To maximize the response rates and minimize the potential non-responder bias, it is usual to send out a number of reminders. However, according to the law of diminishing returns, the third mailing of a survey increases the number of returns by only a small proportion at the cost of upsetting the individuals who have made a conscious decision not to participate in the survey (23). The replies to our two mailings were not significantly different in respect of the main criteria. Also, the sample for our study was selected from a relatively homogenous popu-

lation. Furthermore, the random sample of non-respondents who were directly contacted showed no significant difference with regard to the attainment of the desired medical specialty. We, therefore, believe our data to be valid.

Another limitation of our study is that it did not examine the motives behind the choice of specialty, which could be purely professional, but could also include factors such as expected income, prestige, interest in primary care vs hospital-based practice, or other reasons (24). We relied on participants remembering correctly what had been their desired medical specialty after graduation. Also, in our experience, there is a tendency among physicians to declare that the specialty they practiced was the one to which they had originally aspired. The reason for this is that they probably believe that the failure to have received the training in preferred specialty could be interpreted by others as a weakness. The true percentage of those who did not receive the desired specialty training could, therefore, be even higher. Although the final questionnaire was tested and validated in a pilot run, questions may have been misunderstood. Our measure of a relative job satisfaction was specially designed to serve the purposes of our study, but has not been formally validated. However, we believe that there is a strong correlation between the relative job satisfaction in our study and what is commonly meant by job satisfaction (25). The replies to our two mailings showed no significant differences in respect of the main criteria. The only significant difference between the two mailings was observed in the answers on the self-perceived reasons why the desired specialty was not attained and which specialty was being practiced.

This study did not take into account the sex ratios of applicants for different specialties. A study on sex bias in graduate admissions at the University of California, Berkeley

USA, showed a clear bias against female applicants (26). In Berkeley, the number of available positions per year for each graduate study was known (26), but in our retrospective study on the Austrian system of allocation of training positions, it was not possible to determine the number of training positions per year per specialty (14). The reason for this was that the number of positions changes depending on various conditions, eg, non-allocation, or physicians finishing their training or taking parental leave.

There remains the question of whether or not the Austrian graduate education system furthers the acquisition of the competencies required in family medicine. Our point of departure is that graduates who want to become practitioners in a particular specialty should be able to do so and not end up in family medicine simply because they fail to obtain the training in their desired medical specialty. The Accreditation Council for Graduate Medical Education in the US and the World Organization of General Practitioners/Family Physicians have defined the competencies that a family physician should master (27). In view of the effort necessary to acquire these competencies, we must assume that only fully motivated and committed trainees can hope to make the grade. Apart from promoting an unfavorable selection of trainees for family medicine, the Austrian procedure of allocating training posts leads to a situation in which many graduates who, although in principle suitable for family medicine, would prefer to become specialists and are, therefore, not fully committed to acquiring the competencies required in primary care.

#### Acknowledgments

The authors thank Professor Dr Philip Lupton, MA (Cantab) for reviewing the final English version of this paper and Dr Marco Hoffmann for his helpful remarks on the data evaluation. This study was supported by the Viennese Chamber of Physicians in the collection of data.

#### References

- Boerma W, Dubois C. Mapping primary care across Europe. In: Saltman RB, Rico A, Boerma W, editors. Primary care in the driver's seat? Organizational reform in European primary care. Berkshire: Open University Press McGraw-Hill; 2006. p. 22-49.
- Rese A, Balabanova D, Danishevski K, McKee M, Sheaff R. Implementing general practice in Russia: getting beyond the first steps. *BMJ*. 2005;331:204-7. [Medline:16037457](#) [doi:10.1136/bmj.331.7510.204](#)
- Austrian Health Institute. Quality of health care in Austria [in German]. Vienna: ÖBIG; 2000.
- Spiegel W, Carelli F, Maier M. Unconventional therapies and general practice: implications for academic medicine. *Eur J Gen Pract*. 2007;13:3-4. [Medline:17366286](#) [doi:10.1080/13814780701237683](#)
- Starfield B, Shi L, Grover A, Macinko J. The effects of specialist supply on populations' health: assessing the evidence. *Health Aff (Millwood)*. 2005;(Suppl Web Exclusives):W5-97-W5-107. [Medline:15769797](#)
- Saltman RB, Rico A, Boerma W, editors. Primary care in the driver's seat? Organizational reform in European primary care. In: European Observatory on Health Systems and Policies Series. Figueras J, McKee M, Mossialos E, Saltman RB (series eds.). Berkshire: Open University Press McGraw-Hill; 2006.
- Psarrakis C. The ancillary resident [in German]. *Osterr Arzteztg*. 2001;(22):27.
- Birner P. Visitation of hospital departments for postgraduate medical education by the Viennese Medical Chamber [in German]. *Österreichische Krankenhauszeitung* 2005;46:10-11.
- Pesendorfer T. Qualification trap "medical graduate" –opportunities or risks for Austria's health system [in German]? *St. Pölten: NÖ Patienten- und Pflegeanwaltschaft*; 2004.
- Fried A. Every man for himself and the devil take the hindmost [in German]. *Österreichische Krankenhauszeitung*. 2005;46:5-7.
- European Academy of Teachers in General Practice. EURACT statement on selection of trainers and teaching practices for specific training in general practice. Tartu: EURACT; 2002. Available from: <http://www.euract.org/page03b.html>. Accessed: February 13, 2008.
- Whitcomb ME, Cohen JJ. The future of primary care medicine. *N Engl J Med*. 2004;351:710-2. [Medline:15306674](#) [doi:10.1056/NEJMs045003](#)
- Delzell JE Jr, Ringdahl EN, Kruse RL. The ACGME core competencies: a national survey of family medicine program directors. *Fam Med*. 2005;37:576-80. [Medline:16145636](#)
- Spiegel W, Haoula D, Schneider B, Maier M. Allocation of training posts to applicants for postgraduate medical education in Austria: survey and analysis. *Acad Med*. 2004;79:703-10. [Medline:15234925](#) [doi:10.1097/00001888-200407000-00019](#)
- Merrill JM, Camacho Z, Laux LF, Thornby JI, Vallbona C. Machiavellianism in medical students. *Am J Med Sci*. 1993;305:285-8. [Medline:8484386](#) [doi:10.1097/00000441-199305000-00003](#)
- Merrill JM, Laux LF, Lorimor R, Thornby JI, Vallbona C. Authoritarianism's role in medicine. *Am J Med Sci*. 1995;310:87-90. [Medline:7668310](#)



- 17 Merrill JM, Lorimor RJ, Thornby JI, Vallbona C. Reliance on high technology among senior medical students. *Am J Med Sci*. 1998;315:35-9. [Medline:9427573](#) [doi:10.1097/0000441-199801000-00007](#)
- 18 Williams ES, Skinner AC. Outcomes of physician job satisfaction: a narrative review, implications, and directions for future research. *Health Care Manage Rev*. 2003;28:119-39. [Medline:12744449](#)
- 19 Esteva M, Larraz C, Soler J, Yaman H. Burn-out in Spanish general practitioners [in Spanish]. *Aten Primaria*. 2005;35:108-9. [Medline:15727755](#) [doi:10.1157/13071919](#)
- 20 Von Voltmer E, Kieschke U, Spahn C. Work-related behavior and experience of physicians in the third to eighth year of their professional life [in German]. *Z Psychosom Med Psychother*. 2007;53:244-57. [Medline:17883932](#)
- 21 Grembowski D, Paschane D, Diehr P, Katon W, Martin D, Patrick DL. Managed care, physician job satisfaction, and the quality of primary care. *J Gen Intern Med*. 2005;20:271-7. [Medline:15836532](#) [doi:10.1111/j.1525-1497.2005.32127.x](#)
- 22 Goehring C, Bouvier Gallacchi M, Kunzi B, Bovier P. Psychosocial and professional characteristics of burnout in Swiss primary care practitioners: a cross-sectional survey. *Swiss Med Wkly*. 2005;135:101-8. [Medline:15832226](#)
- 23 Elliott AM, Hannaford PC, Simpson JA, Warskyj M, Ferry S, Owen-Smith V. Should postal epidemiological studies stop doing third mailings? *Eur J Gen Pract*. 2001;7:104-10.
- 24 Vaglum P, Wiers-Jenssen J, Ekeberg O. Motivation for medical school: the relationship to gender and specialty preferences in a nationwide sample. *Med Educ*. 1999;33:236-42. [Medline:10336753](#) [doi:10.1046/j.1365-2923.1999.00293.x](#)
- 25 Lloyd S, Streiner D, Hahn E, Shannon S. Development of the emergency physician job satisfaction measurement instrument. *Am J Emerg Med*. 1994;12:1-10. [Medline:8285952](#) [doi:10.1016/0735-6757\(94\)90187-2](#)
- 26 Bickel PJ, Hammel EA, O'Connell JW. Sex bias in graduate admissions: data from Berkeley. *Science*. 1975;187:398-404. [Medline:17835295](#) [doi:10.1126/science.187.4175.398](#)
- 27 Delzell JE Jr, Ringdahl EN, Kruse RL. The ACGME core competencies: a national survey of family medicine program directors. *Fam Med*. 2005;37:576-80. [Medline:16145636](#)