

Change of Students' Interest in Psychiatry over the Years at School of Medicine, University of Belgrade, Serbia

Nadja P. Maric, MD, PhD,^{1,2} Dragan Stojiljkovic, MD,² Bojana Milekic, MD,² Marko Milanov, MD,² Jovana Bijelic, MD,² and Miroslava Jasovic-Gasic, MD, PhD^{1,2}

¹ Clinic for Psychiatry, Clinical Center Serbia, Belgrade, Serbia

² School of Medicine, University of Belgrade, Belgrade, Serbia

ABSTRACT

Introduction: The present study examines how, during the course of medical education, students in Serbia change their attitude and affinity towards choosing psychiatry as their future residency.

Method: Medical students (MS) in the 2nd year (sophomores, n=105), and in the 5th year (seniors, n=75) of the medical school participated in the survey. A 23-item questionnaire was administered to evaluate their attitude towards psychiatry and was compared to their attitude towards other medical specialties (internal medicine, surgery, pediatrics, gynecology, general medicine).

Results: Attitude towards psychiatric residency changed during the course of medical studies. The 5th year students exhibited lower attitude scores regarding psychiatry when compared to their junior colleagues and when weighted on their socio-demographic background and attitude towards other residencies. Positive attitude was evident in 15% sophomores and 16% seniors, while negative attitude was 25% in sophomores and 47% in seniors, markedly differing in their statement that they would never consider psychiatry as the choice residency ($\chi^2_{(3)}=11.9$; $p<.01$). Attitude toward psychiatry was not predictable from the socio-demographic parameters.

Discussion: The data from Serbia show increase in negative attitude towards psychiatry over the course of medical studies, although level of interested students is one of the highest in the world as reported in recent literature.

INTRODUCTION

In the western world, the number of psychiatry residents has been in steady decline over the last decades of the 20th century. In a recent U.K. survey medical students viewed psychiatry as the least desirable clinical specialty for their future career (1). As a result, there is a shortage of psychiatrists in many countries. For example, 12% of all available psychiatrist positions remain vacant in U.K. (2), whereas in U.S.A. that percent is 7.1% (3). This observation triggered research interest in many countries to identifying factors associated with this decrease in interest in psychiatry (4-8), often asking questions such as "How to win the hearts and minds of students in psychiatry?" (9).

Data suggest that the decrease in interest in psychiatry is evident both over the last decades, as well as over the course of studies in medical school (10, 11). A questionnaire, introduced by Feifel et al. in 1999, given to the first year medical students in California and Texas, showed that only 0.5 % of medical students chose psychiatry as their future residency, and only 7.2 % of students considered it a possible choice. The same authors noticed that during a single decade (1988-1998) the number of U.S. medical students matching to psychiatric residencies declined by 42.5% (12). In contrast, about 10% of medical students in their pre-clinical studies at the Hebrew University in Israel (2000-2002) expressed a strong interest in psychiatric residency, and 23% of them considered it a possible choice (13), representing one of the most affirmative attitudes towards psychiatry in the world. However, psychiatry was ranked the least attractive specialty by the same population of Hebrew

University students now in their clinical years (4th-6th year), with an average of only 14.9% of students choosing psychiatry as a possible career choice (14).

Similar research has never been conducted in former Yugoslavia or Serbia. In Serbia, medical education is concurrent to undergraduate education and lasts six years. Per traditional curriculum, psychiatry is taught in the fourth year of medical school as a single 30-week clinical course organized in 30 hours of theoretical lectures and 60 hours of alternating smaller group sessions at clinical sites. Students listen to lectures on neurobiology, diagnostic features, course of illness, epidemiology and treatment of the core psychiatric disorders, and are exposed to psychiatric clinical practice through the mental status exam and psychiatric interviewing. Clerkship assignments are available in both inpatient units and day hospital programs. The ratio of psychiatrists is 10 per 100,000 citizens in the general population.

The aim of this study is to explore the change of students' affinity for choosing psychiatry as their future residency by comparing the affinity of sophomores with that of seniors, as it relates to the two years prior and two years following the exposure to the psychiatry course and limited clinical practice in their medical education.

METHOD

THE QUESTIONNAIRE

Adapted, modified and translated version of the questionnaire originally created by Feifel et al. (12) was used as a poll. The questionnaire consists of 23 items. The majority of answers were offered in 4-point Likert-type scales, three- and six-grade scale forms, and some were presented in open answer form. Students were questioned by means of an anonymous survey about their opinions of the following six residencies: family medicine, internal medicine, surgery, pediatrics, gynecology and psychiatry. The questionnaire included the following areas:

1. Social and demographic characteristics of students;
2. General factors influencing the choice of residency (lifestyle, societal recognition, salary, dynamic and challenging job, opportunity to help others, importance of having a "lobby" in the career field, interest in research, diagnostic/therapeutic procedures and quality of doctor-patient relationship);
3. Personal affinity toward the six offered residencies;
4. Opinions on miscellaneous aspects of professional

life, such as: lifestyle, salary, professional satisfaction, characteristics of the residency itself, professional and social recognition, intellectual challenge, probability of successful treatment, technological progress of diagnostic and therapeutic procedures, prospective, strong scientific foundation, comfort and networks within the medical field;

5. Students' perception of societal opinion on different specialists.

SAMPLING METHODS AND PROCEDURES

An unpublished pilot-study on a smaller sample of 4th year students was conducted to calculate the required sample size to obtain the power of $1-\beta=.80$ at $\alpha=.05$. Approximately 80 students per sample were found to be sufficient.

There were 413 students attending second year studies at the School of Medicine, Belgrade University (SM BU), in the academic year 2007/08. They were divided into five groups, based on surname alphabetical order, and then into four subgroups for the total of 20 subgroups. We randomly selected four groups to receive questionnaires during the physiology classes. The required number of participants to provide 80 valid subjects was 120, expecting a 70% response rate, as in the pilot-study.

Similarly, 415 students attended the 5th year of SM BU in the 2007/08 academic year. Like the sophomores, we divided them into five groups based on surname alphabetical order. The only available method of sampling seniors was to survey all students attending forensic medicine lectures during one week, thus acquiring a portion of students from each of the five alphabetical groups. Each day, another group attended the same lecture, so there was no overlap. The sampling design was non-probabilistic, accidental, and it yielded a sample which was not representative in strict statistical terms. Nevertheless, since no selection criteria other than presence in the forensic medicine amphitheater were used to sample the senior population, we did not expect the sample to be biased in any way.

The Departments of Physiology and Forensic Medicine gave their consent for conducting this survey at the beginning of teaching sessions. The survey was permitted by the Department of Psychiatry and the local Ethics Committee.

PARTICIPANTS AND MISSING DATA

Out of 122 sophomores (29.5% of the total), 119 participated in the survey (97.5%). One hundred and fourteen sophomores filled out their questionnaires. Seven cases

(6.1%) contained missing values for attitude ratings and two scores were identified as outliers, leaving 105 valid cases for further analysis.

Out of 90 senior students (21.7% of total number of seniors) who participated in the survey, 81 (90%) provided filled out questionnaire sheets, of which four (4.9%) were discarded due to missing data and two were omitted as outliers.

VARIABLES AND STATISTICAL PROCEDURES

1. The academic year of the student (2nd year vs. 5th year) is considered the independent variable in MANCOVA.
2. Social and demographic parameters such as gender, type of completed high school (grammar school vs. nursing high school), the population size of student's hometown (<10,000; 10,000-100,000; 100,000-500,000 and >500,000 inhabitants), religious affiliation (Orthodox Christian, Catholic Christian, Islamic, Other and Unaffiliated) and student's current average academic grade (6.0 - 10.0 scale) were measured to be used as covariates in MANCOVA. To avoid non-linear relationships, the size of student's hometown was dichotomized at the cut-off point of 100,000 inhabitants. Gender, type of high school and hometown size are considered reliable as students would have no reservation in reporting them. The reliability of reporting academic grade average, on the other hand, was questionable, partly due to the ever-changing nature of this variable (some students simply do not keep track and provided a guess), and more so because of the large number of missing values which would have had to be estimated or omitted (seven cases [6.5%] in the sophomore group and 12 cases [15.6%] in the senior group). MANCOVA with or without the academic grade average as a covariate showed no discrepancy, implying that this covariate added little specific adjustment. Religious affiliation was unsuitable to be used as covariate, having a split more extreme than 90/10. These two potential covariates were, therefore, omitted from the main MANCOVA, but described for each sample and compared.
3. Students' opinions on each of the six clinical residencies in terms of 14 aforementioned aspects of the profession (see Method; "Instrument") were given as ratings from 1 to 4 in range of Rating scores (or attitude scores) for each residency and calculated by summing individual ratings. A square-root-type transformation was applied to the rating scores to correct the skew and kurtosis. Transformed atti-

tude scores were analyzed as dependent variables in MANCOVA. Students were also asked to report their personal affinity toward each of the six residencies. Consistency between reported "affinity" and "attitude score" was assessed regarding each residency through Cronbach's alpha statistic, where values above .7 indicate a good internal reliability of the questionnaire.

4. The importance of having an active "lobby" (students' private network of individuals willing and able to help promote his/her career in the given specialty, often referred to as "connections" in our society) for the clinical specialty of choice was measured on a three-point scale as reported by students and analyzed using Mann-Whitney's U-test.
5. Three aspects of medicine (research, diagnostics/therapy and doctor-patient relationship) were ranked according to their importance to a student and analyzed with Mann-Whitney's U-test.
6. The analyses were performed using SPSS for Windows 16.0.1 and G*Power 3.0.8.

RESULTS

The study samples consisted of 105 sophomore and 75 senior students' survey sheets, after discarding those with missing data and outliers. The assumptions of normality, linearity, homogeneity of variance-covariance matrices and absence of multicollinearity were all met.

Socio-demographic data for the two groups are presented in Table 1.

Students in both samples enrolled in Medical School at the age of 19. Sophomores were 20 and seniors approximately 24 years old at the time of the survey. The academic grade averages were not significantly different between the groups ($t_{(151)} = -1.854$, $p = .066$), though the effect size indicated a small effect of difference and relative lack of power ($d = .29$, $1 - \beta = .43$). Both samples showed similar degrees of female predominance, namely 7:3. In terms of religious affiliation, students of both samples declared themselves predominantly as Orthodox Christian. There were significantly more grammar school graduates in the senior ($\chi^2_{(1)} = 10.105$, $p = .001$) than in the sophomore group (in Serbia, only grammar school and nursing secondary school graduates are eligible to study medicine).

Students were asked how much they relied on their lobbies for entering their desired clinical specialty. Fifty-four percent of sophomores answered "not at all" compared to 38% of seniors. A similar percentage of students in both

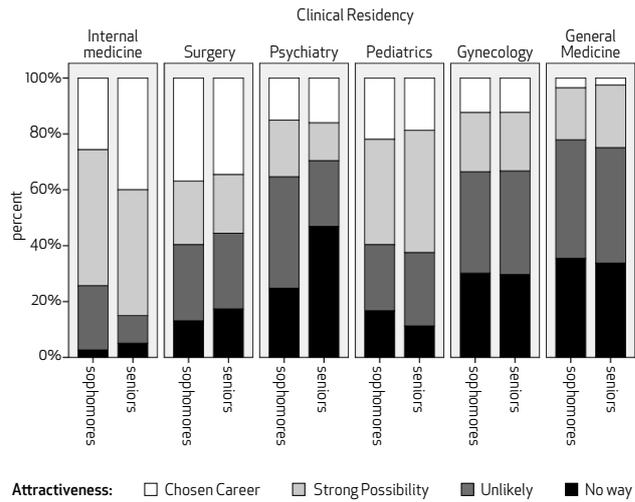
Table 1. Descriptive data on the samples and populations

| | | Sophomores | | Seniors | |
|---|--------------------------|------------|------|---------|------|
| | | Count | % | Count | % |
| N (sample) | | 105 | 25.4 | 75 | 18.1 |
| N (population) | | 413 | | 415 | |
| Gender (sample) | Male | 27 | 25.7 | 23 | 30.7 |
| | Female | 78 | 74.3 | 52 | 69.3 |
| Gender (population) | Male | 104 | 25.2 | 125 | 30.1 |
| | Female | 309 | 74.8 | 290 | 69.9 |
| Religious affiliation | Orthodox Christian | 100 | 96.2 | 64 | 85.3 |
| | Catholic Christian | 0 | .0 | 0 | .0 |
| | Islamic | 0 | .0 | 5 | 6.7 |
| | Other | 0 | .0 | 0 | .0 |
| | Atheist | 4 | 3.8 | 6 | 8.0 |
| | Missing | 1 | 1.0 | 0 | .0 |
| | Total valid | 104 | | 75 | |
| Size of students' hometown (by number of inhabitants) | Less than 10,000 | 38 | 36.2 | 19 | 25.3 |
| | 10,000 to 100,000 | 13 | 12.4 | 8 | 10.7 |
| | 100,000 to 500,000 | 33 | 31.4 | 43 | 57.3 |
| | More than 500,000 | 21 | 20.0 | 5 | 6.7 |
| | Valid total | 105 | | 75 | |
| Pre-finished secondary school | Grammar-school | 64 | 61.0 | 63 | 84.0 |
| | Nursing secondary school | 41 | 39.0 | 12 | 16.0 |
| | Valid total | 105 | | 75 | |
| | | Mean | SD | Mean | SD |
| Age at entering the Medical School | | 18.87 | .52 | 18.87 | .55 |
| Age at the time of the survey | | 20.09 | .65 | 24.35 | 1.39 |
| Academic marks average | | 8.11 | .86 | 8.34 | .70 |

samples answered “to a small extent” (30% and 31%, respectively). Interestingly, while only 15% of sophomores said that they relied on their lobby “to a large extent,” 31% of seniors did so ($U=3062$, $Z=2.609$, $p=.009$).

Seniors attributed more importance than sophomores to psychiatric diagnostics and therapy. Namely, 42% of sophomores thought that diagnostics and therapy were the most important aspects of medicine, while 59% of seniors thought so ($U=2477$, $Z=2.456$, $p=.014$). The opposite was seen concerning the importance of research since 24% of sophomores and 13% of seniors gave their prime choice to medical research ($U=2565$, $Z=2.005$, $p=.045$). The two groups shared similar views on the relative importance of the quality of the doctor-patient relationship. Thirty-five percent of sophomores and 29% of seniors thought it the most important ($U=2880$, $Z=.654$, $p=.513$).

Figure 1. Comparison of attractiveness of the six given clinical residencies between sophomore and senior students



Fifteen percent of sophomores and 16% of seniors stated that psychiatry was their career choice. On the other hand, while 25% of sophomores felt a strong aversion toward psychiatry, 47% of seniors declared that there was “no way” they would specialize in it (Figure 1). Distributions across the two groups of students were statistically different ($\chi^2_{(3)}=11.9$; $p<.01$).

Table 2 presents raw attitude scores by median and interquartile range, whereas transformed scores are given as means and standard deviations. Mean differences with their 95% confidence intervals are also presented.

The average Cronbach’s alpha of .716 across the six given residencies (ranging from .596 to .794) indicates a good level of internal consistency between personal affinity toward a particular residency and the attitude score regarding that same residency.

1. Do attitudes toward the offered six clinical residencies (internal medicine, surgery, psychiatry, pediatrics, gynecology, general medicine) differ between pre-clinical and clinical medical students, after controlling for socio-demographic parameters?

The combined dependent variables were significantly related to the main effect (academic year, i.e., sophomores vs. seniors) ($F_{(6,170)}=4.074$, $p=.002$) after adjustment for covariates (gender, type of high school and hometown size). The size of effect according to Cohen was medium to large, having obtained the partial $\eta^2=.13$ with 95% confidence interval ranging from .03 to .19 (15). Therefore, we concluded that student attitudes toward different residencies changed during the course of their medical studies.

Table 2. Attitude scores toward the six given medical residencies in sophomore and senior group

| Residency | SOPHOMORES (N=105) | | | | | SENIORS (N=75) | | | | | Difference of means of the transformed attitude scores | | |
|-------------------|-------------------------------|-----------------------------------|----|-----------------------------|------|-------------------------------|-----------------------------------|----|-----------------------------|------|--|-------------------------------|-------|
| | Untransformed attitude scores | | | Transformed attitude scores | | Untransformed attitude scores | | | Transformed attitude scores | | Mean Difference (seniors minus sophomores) | 95% CI of the Mean Difference | |
| | Median | Interquartile range (percentiles) | | Mean | SD | Median | Interquartile range (percentiles) | | Mean | SD | | | |
| Internal medicine | 47 | 42 | 51 | 3.80 | 1.03 | 50 | 45 | 53 | 4.29 | 1.03 | 0.49 | 0.18 | 0.79 |
| Surgery | 48 | 45 | 51 | 4.04 | 0.82 | 48 | 44 | 50 | 4.00 | 0.86 | -0.04 | -0.29 | 0.21 |
| Psychiatry | 38 | 32 | 43 | 2.66 | 0.93 | 34 | 27 | 40 | 2.19 | 0.90 | -0.47 | -0.74 | -0.19 |
| Pediatrics | 43 | 40 | 48 | 3.36 | 0.95 | 45 | 38 | 49 | 3.56 | 1.05 | 0.20 | -0.09 | 0.50 |
| Gynecology | 42 | 38 | 47 | 3.26 | 1.01 | 42 | 37 | 47 | 3.28 | 1.04 | 0.02 | -0.29 | 0.32 |
| General medicine | 36 | 30 | 40 | 2.41 | 0.91 | 37 | 29 | 42 | 2.48 | 0.94 | 0.06 | -0.21 | 0.34 |

2. Upon completion of the 30-week course, does psychiatric residency become more or less attractive to medical students when accounting for the variance shared with both socio-demographic factors and other residencies?

The two groups had significantly different attitude toward psychiatry (Roy-Bargman step-down analysis ($F_{(1,170)}=9.721$, $p=.002$): the seniors had lower attitude scores regarding psychiatry in comparison to sophomores, when weighted on their socio-demographic background and attitude toward other residencies. The unique explained variance was 5.4% ($\eta^2=.05$ with 95%CI from .01 to .13), i.e., small to medium effect.

3. How do socio-demographic parameters (gender, size of student's hometown and completed secondary school) influence students' attitudes toward internal medicine, surgery, psychiatry, pediatrics, gynecology and general medicine in pre-clinical vs. clinical phase of the studies?

The influence of background variables on students' attitudes was assessed using the sequential multiple regression on separate groups. The priority in the sequence of entry of the predictors was given to the more general ones, i.e., gender > size of hometown > type of high school. Upon entering, the predictors were tested for significance of model improvement by contrasting the zero-level model, and then either retained in the model, or excluded, accordingly. The direction of the association and the strength of the variable to serve as a predictor were measured by standardized coefficients (β_i) and adjusted R^2 . Positive β_i indicated a positive association while R^2 equals to the percent of variance explained by the predictor.

In the sophomore group, attitude toward surgery, psychiatry and gynecology could not be predicted from the socio-demographic parameters. However, completing nursing high school was associated with a more positive attitude to internal medicine ($t=2.450$, $p=.016$, $\beta_i=.235$, $R^2=.046$), pediatrics ($t=2.827$, $p=.006$, $\beta_i=.268$, $R^2=.063$) and general medicine ($t=2.452$, $p=.016$, $\beta_i=.235$, $R^2=.046$). Gender and hometown size did not show any associations with the preferences. In the senior group, completing grammar school was associated with a more positive attitude toward internal medicine ($t=-2.338$, $p=.006$, $\beta_i=-.264$, $R^2=.057$). Preference for surgery and pediatrics was stronger in students originating from larger cities ($t=2.665$, $p=.010$, $\beta_i=.297$, $R^2=.076$) and ($t=2.824$, $p=.006$, $\beta_i=.314$, $R^2=.086$), respectively. Gynecology and general medicine were seen as more attractive to female students ($t=2.555$, $p=.013$, $\beta_i=.286$, $R^2=.069$) and ($t=2.187$, $p=.032$, $\beta_i=.248$, $R^2=.049$), respectively. The attitude toward psychiatry was not influenced by the background factors among seniors.

DISCUSSION

Medical students at the University of Belgrade, Serbia, show a stronger affinity towards psychiatry (~15%) when compared to their peers in other countries such as United Kingdom (16, 17), United States (18, 19), France (20), Germany (21), Australia (22, 23) and Denmark (24). Nevertheless, there is a decrease in interest in psychiatry among medical students after they have completed the psychiatric clerkship. The observed change is not due to a decrease in the number of interested students over the course of medical education, but to

an increase in the number of students who show a negative attitude toward psychiatry (typical answer: “I would never choose psychiatry for my future residency”), view psychiatry unfavorably, and lack confidence and respect for both psychiatrists and the field.

In both groups, attitude toward psychiatry was not predicted from the socio-demographic parameters: gender, size of student’s hometown or type of completed high school. However, some studies suggest that female students have a significantly more positive attitude towards psychiatry as a subject (25) and that their positive attitude about treatment of mental illness predicts less stigmatizing attitudes towards mentally ill (26). Interestingly, it seems that Serbian psychiatry is a good illustration of the aforementioned findings. Our own recent survey points out that about 80% of young psychiatrist in the country are females (27), and this trend is likely to continue: gender ratio in School of Medicine in Belgrade, as evident from our samples, is persistently asymmetric, in both seniors and sophomores.

Inevitably, the question is raised as to what factors, over the course of medical education, contribute to the worsening of psychiatry’s image in the eyes of medical students?

In our survey focused on sophomores, we discovered that their aversion to psychiatry was based mostly on their prejudices towards psychiatric patients, and the idea that this field is extremely emotionally challenging with high exposure to stress and frequent unpleasant situations. And indeed, during psychiatry classes, students may easily find justification for such thinking. Psychiatry classes are organized in a manner that too frequently exposes them to interactions with severely ill and hospitalized patients. Students have little if any contact with more common out-patients. Therefore, their insight into patients’ treatment and rehabilitation is quite poor. Such experience and insight acquired during medical school provide the foundation for thinking of psychiatry as a field with a low probability of successful treatment.

On the other hand, there is no doubt that psychiatry gained its great popularity in the last century due to the “couch” therapy, conversational therapy and the “aura of wisdom” ascribed to psychiatrists over time. Some of the studies show that psychotherapy-oriented classes increase popularity of the subject (28-30). However, modern psychiatry is changing its character, so today we have many different approaches such as biological, behavioral, socio-psychological, “eclectic,” etc. This variety of approaches inevitably decreases perceived coherence of the field, as well as the ability of students to understand it after a fairly

short course of only 90 hours.

Nevertheless, an important and encouraging fact arising from our study is that medical students interested in psychiatry and the human psyche at the beginning of medical school maintain their interest over the years of their education.

Still, only 4.4% of the total medical school graduates actually apply for residency in psychiatry (2006 data, Department of Post-Graduate Studies at the School of Medicine, University of Belgrade). These data raise another question: Are students’ preferences during medical school predictors of eventual career choice? According to Cameron and Persad, who evaluated residents’ decisions to enter psychiatry, 14% of students make their decision before entering medical school, 28% as medical students and 58% after graduation (31). On the contrary, recent data by Manasis and colleagues, although limited by the small sample size of residents, suggest that positive clerkship experience and participation in psychiatry electives may be modifiable programmatic factors that could enhance recruitment to psychiatry (32).

Since our study included only medical students from the University of Belgrade, and not other smaller universities, we can not make more general conclusion regarding the whole country. Additionally, our survey took place during the transitional and reforming period of our medical school curriculum where sophomores’ program followed the requirements of the Bologna Declaration (a process of unifying European higher education by making academic degrees and quality assurance standards compatible throughout Europe, started in Serbia in 2005), whereas the seniors’ classes still followed the old curriculum. The difference in curriculum may have affected comparability of these two groups. Although most of the general parameters for sophomores and seniors were similar, we are aware of the fact that the unpaired sample in our cross-sectional study is a limitation, which could be overcome by performing a longitudinal follow-up study. Finally, a variety of methodological approaches applied in other studies and presented with numeric results on sometimes incompatible scales may have prevented us from presenting the matter unambiguously. We nevertheless believe that these restrictions do not reduce the value and importance of our study.

CONCLUSION

The present study is the first of its kind in Serbia that used a precise and internationally comparable methodological

instrument. We believe that it will become a reference for further research in this direction. Instead of a conclusion, we would like to ask a question: Do data from our study justify the need for reforming the way students are taught psychiatry in the medical school in Serbia? Currently, even with the described lack of interest in psychiatry there are still enough applicants to meet government quotas in Serbia. Therefore, we agree with the suggestion of Gat and colleagues (14) that "educational programs need to target those who show initial curiosity and interest in the workings of the mind and spirit." Results from several studies show that elective classes and special seminars for interested students have the greatest effect on students' favorable view of psychiatry (28, 29, 33, 34). However, negative beliefs based on inaccurate perceptions of objective evidence (e.g., success rate of psychiatric treatments) should be specifically targeted in the teaching curriculum and psychiatric clinical practice.

Declaration of interest: None

Acknowledgement:

We thank Dr. Svetlana Stepanovic for critical reading and editing of the manuscript.

References

- Rajagopal S, Rehill K, Godfrey E. Psychiatry as a career choice compared with other specialties: A survey of medical students. *Psychiatr Bull* 2004; 28:444-446.
- Pidd S. Recruiting and retaining psychiatrists. *Adv Psychiatr Treat* 2003; 9:405-413.
- National Residents Matching Program Match Results, 1999-2003. Washington, DC, National Residents Matching Program.
- Syed E, Siddiqi M, Dogar I, et al. Attitudes of Pakistani medical students towards psychiatry as a prospective career: A survey. *Acad Psychiatr* 2008; 32:160-164.
- Ndeti D, Khasakhala L, Ongecha-Owuor F, et al. Attitudes toward psychiatry: A survey of medical students at the University of Nairobi, Kenya. *Acad Psychiatry* 2008; 32:154-159.
- Baptista T, Pérez CS, Méndez L, et al. The attitudes toward psychiatry of physicians and medical students in Venezuela. *Acta Psychiatr Scand* 1993; 88:53-59.
- Chung KF, Chen EYH, Liu CSM. University students' attitudes towards mental patients and psychiatric treatment. *International J Soc Psychiatry* 2001; 47:63-72.
- Pailhez G, Bulbena A, Balon R. Attitudes to psychiatry: A comparison of Spanish and US medical students. *Acad Psychiatry* 2005; 29:82-91.
- El-Sayeh HG, Budd S, Waller R, et al. How to win the hearts and minds of students in psychiatry. *Adv Psychiatr Treat* 2006; 12:182-192.
- Pardes H. Medical education and recruitment in psychiatry. *Am J Psychiatry* 1982; 139:1033-1035.
- Brockington I, Mumford D. Recruitment into psychiatry. *Br J Psychiatry* 2002; 180:307-312.
- Feifel D, Moutier C, Swerdlow N. Attitudes toward psychiatry as a prospective career among students entering medical school. *Am J Psychiatry* 1999; 156:1397-1402.
- Abramowitz M, Bentov-Gofrit D. The attitudes of Israeli medical students toward residency in psychiatry. *Acad Psychiatry* 2005; 29:92-95.
- Gat I, Abramowitz M, Bentov-Gofrit D, et al. Changes in the attitudes of Israeli students at the Hebrew University Medical School toward residency in psychiatry: A Cohort Study. *Isr J Psychiatry Relat Sci* 2007; 44:194-203.
- Cohen J. *Statistical power analysis for the behavioural sciences*, 2nd ed. Hillsdale, N.J.: Lawrence Erlbaum, 1988.
- Zimny GH, Sata LS. Influence of factors before and during medical school on choice of psychiatry as a specialty. *Am J Psychiatry* 1986; 143:77-80.
- Singh S, Baxter H, Standen P, et al. Changing the attitudes of "tomorrow's doctors" towards mental illness and psychiatry: A comparison of two teaching methods. *Med Educ* 1998; 32:115-120.
- Balon R, Franchini G, Freeman P, et al. Medical students' attitudes and views of psychiatry: 15 years later. *Acad Psychiatry* 1999; 23:30-36.
- Eagle P, Marcos L. Factors in medical students' choice of psychiatry. *Am J Psychiatry* 1980; 137:423-427.
- Samuel-Lajeunesse B, Ichou P. French medical students' opinion of psychiatry. *Am J Psychiatry* 1985; 142:1462-1466.
- Strebel B, Obladen M, Lehrmann E, et al. Attitude of medical students to psychiatry: A study with the German translated, expanded version of the ATP-30. *Nervenarzt* 2000; 71:205-212.
- Yellowlees P, Vizard T, Eden J. Australian medical students' attitudes towards specialities and specialists. *Med J Aust* 1990; 152:587-592.
- Malhi G, Parker G, Parker K, et al. Attitudes toward psychiatry among students entering medical school. *Acta Psychiatr Scand* 2003; 107:424-429.
- Holm-Petersen C, Vinge S, Hansen J, et al. The impact of contact with psychiatry on senior medical students' attitudes toward psychiatry. *Acta Psychiatr Scand* 2007; 116:308-311.
- Kuhnigk O, Strebel B, Schilauske J, et al. Attitudes of medical students towards psychiatry: Effects of training, courses in psychiatry, psychiatric experience and gender. *Adv Health Sci Educ Theory Pract* 2007; 12:87-101.
- Savrun BM, Arikan K, Uysal O, Cetin G, Poyraz BC, Aksoy C, Bayar MR. Gender effect on attitudes towards the mentally ill: A survey of Turkish university students. *Isr J Psychiatry Relat Sci* 2007; 44:57-61.
- Maric NP, Jasovic-Gasic MM, Lecic-Tosevski D. Has psychiatry become a female profession? *European Psychiatry* 2008; 23:5385.
- Weintraub W, Plaut M, Weintraub E. Recruitment in psychiatry: Increasing the pool of applicants. *Can J Psychiatry* 1999; 44:473-477.
- Sturgeon D. Outcome variables for medical students who take on psychotherapy patients. *Proceedings of the 15th European Conference on Psychosomatic Research*. London: John Libbey, 1986; pp. 363-366.
- Yakeley J, Shoenberg P, Heady A. Who wants to do psychiatry? The influence of a student psychotherapy scheme - a 10-year retrospective study. *Psychiatr Bull* 2004; 28:208-212.
- Cameron P, Persad E. Recruitment into psychiatry: A study of the timing and process of choosing psychiatry as a career. *Can J Psychiatry* 1984; 29:676-680.
- Manassis K, Katz M, Lofchy J, Wiesenthal S. Choosing a career in psychiatry: Influential factors within a medical school program. *Acad Psychiatry* 2006; 30:325-329.
- Alpert JE, Schlozman S, Badaracco MA, et al. Getting our own house in order: Improving psychiatry education to medical students as a prelude to medical school education reform. *Acad Psychiatry* 2006; 30:170-173.
- Lofchy J, Brunet A, Silver I. The psychiatry institute for medical students: A novel recruitment strategy. *Acad Psychiatry* 1999; 23:151-156.