

STIGMATISING ATTITUDES TOWARDS MENTAL HEALTH CONDITIONS AMONG MEDICAL STUDENTS IN FIVE SOUTH-EASTERN EUROPEAN COUNTRIES

STIGMATIZIRAJOČI ODNOS DO DUŠEVNEGA ZDRAVJA MED ŠTUDENTI MEDICINE V PETIH DRŽAVAH JUGOVZHODNE EVROPE

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Received: Apr 10, 2024

Accepted: Aug 02, 2024

Original scientific article

ABSTRACT

Introduction: Stigmatising attitudes towards mentally ill people are present among healthcare professionals. The aim of the study was to evaluate medical students' attitudes in five medical schools from Albania, Bulgaria, Moldova, Romania and Serbia and to determine if psychiatry clerkship improves these attitudes.

Keywords:

Stigmatisation
Medical students
Mental disorders
Psychiatry
Mental health

Methods: In the first stage, the study included students from the first and final years of medical school; in the second stage, only final-year students were included; The Mental Illness Clinicians' Attitude Scale (MICA-2) and the Attribution Questionnaire (AQ-9) were used in this study. The total sample comprised 1,526 medical students in the first stage and 614 in the second stage.

Results: The analysis of the average AQ-9 and MICA-2 scores between countries revealed significant differences ($p < 0.05$). Multivariable analysis showed that female students were 30% more likely to have elevated AQ-9 scores than male students ($p = 0.029$). Final-year students had a significantly lower chance of having a higher MICA-2 score compared to first-year students ($OR = 0.7$; $p < 0.05$).

Conclusions: Psychiatry clerkship contributes to a decrease in the level of stigmatising attitudes among medical students. Further research is required to assess the curricula to achieve better results in reducing stigma among future doctors.

IZVLEČEK

Ključne besede:

stigmatizacija
študenti medicine
duševne motnje
psihijatrija
duševno zdravje

Uvod: Stigmatizirajoči odnos do duševno bolnih ljudi je prisoten tudi med zdravstvenimi delavci. Namen študije je bil oceniti stališča študentov medicine na petih medicinskih fakultetah v Albaniji, Bolgariji, Moldaviji, Romuniji in Srbiji ter ugotoviti, ali praksa na psihijatriji ta stališča izboljša.

Metode: V prvi fazi je študija vključevala študente prvega in zadnjega letnika medicinske fakultete, v drugi fazi pa samo študente zadnjega letnika; v tej študiji sta bila uporabljena lestvica stališč zdravnikov do duševnih bolezni (MICA-2) in vprašalnik o atribuciji (AQ-9). Skupni vzorec je obsegal 1526 študentov medicine v prvi fazi študije in 614 v drugi fazi.

Rezultati: Analiza povprečnih rezultatov AQ-9 in MICA-2 med državami je pokazala pomembne razlike ($p < 0,05$). Multivariatna analiza je pokazala, da je bila verjetnost, da bodo imele študentke za 30 % višji rezultat AQ-9 kot študenti ($p = 0,029$). Študenti zadnjega letnika so imeli v primerjavi s študenti prvega letnika bistveno manj možnosti za višji rezultat MICA-2 ($OR = 0,7$; $p < 0,05$).

Zaključki: Psihiatrična praksa prispeva k zmanjšanju stopnje stigmatizirajočega odnosa med študenti medicine. Potrebne so nadaljnje raziskave za oceno učnih načrtov za doseganje boljših rezultatov pri zmanjševanju stigmatizacije med bodočimi zdravniki.

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1 INTRODUCTION

According to WHO data, in 2019 over 12% of the world's population suffered from a mental health condition (1), a rate which increased during the COVID-19 pandemic, especially regarding depressive and anxiety disorders (2). In this context, the effects of stigma associated with mental illnesses became more significant, necessitating new and more effective strategies to address it.

Defined by Erving Goffman, stigma comprises socially discrediting attributes, behaviours, or reputations leading individuals to be perceived as undesirable or abnormal (3). Stigma towards mentally ill people has two main forms: public stigma, often described as the general population's reaction to mental health conditions, and self-stigma where individuals internalise societal prejudices (4, 5).

Public stigma is also prevalent among healthcare professionals (6, 7), with a special note on psychiatrists (8, 9) and medical students (10, 11). Medical students are an important target of anti-stigma campaigns, although the effectiveness of interventions varies (12-15). There are studies that have shown that medical students' attitudes towards mental illnesses prior to psychiatric clerkship are similar to the general population in terms of negative beliefs and attitudes (16-19). There is data regarding the positive outcome of psychiatry clerkship (20-25). Other studies have shown that post-clerkship attitudes of students worsened based on newly gained beliefs about patients' aggression and their unpredictable and dangerous behaviour, considering them as having poor prognosis or even being incurable, while working as a psychiatrist is too stressful and emotionally overwhelming (25-28).

Albania, Bulgaria, Moldova, Romania and Serbia share similar characteristics, not just their geographical location. Over the past three decades, both the healthcare and education systems in these countries have undergone continuous and slow reform (29). In the realm of mental health research, there is a scarcity of comparative studies focusing on the stigmatising attitudes of medical students towards individuals with mental illnesses in the contexts of these five countries. The length and content of psychiatry clerkship were quite similar across all countries involved in the research, consisting on average of 90 academic hours per semester of lectures and practice in clinical psychiatry settings, without differences in content between the two stages of the study.

The aim of the study was to measure and compare medical students' attitudes towards people with mental health conditions in the aforementioned countries, and to assess changes in these attitudes following psychiatric clerkships. We initially hypothesized that there would be no difference in stigmatising attitudes among medical students from these countries and that improved knowledge about mental health conditions would reduce negative attitudes.

2 METHODS

2.1 Study settings

The study was conducted at faculties of medicine in five South-Eastern European countries as follows: Tirana Medical University, Albania; Pleven Medical University, Bulgaria; State Medical and Pharmaceutical University Nicolae Testemitanu, Chisinau, Moldova; University of Medicine and Pharmacy of Craiova, Romania; University of Novi Sad, Serbia.

2.2 Study stages

The study consisted of two stages: (I) the first, during academic year 2015/2016, included medical students from the first year of medical faculties and students in their final year; (II) the second, during academic year 2020/2021, included only final-year medical students. Students surveyed in the second stage were mostly the same students included in the first stage when they were in the first year of their studies.

2.3 Study sample

In the initial stage of the research, we collected two convenience samples from each medical faculty: one comprising 860 first-year students and the other consisting of 666 final-year students. During the second stage, the study included only final-year students, with 614 participants, after they had completed the psychiatry clerkship.

The inclusion criteria for first-year students were being registered and attending the medical faculty, while the additional criterion for final-year students was the completion of the psychiatry clerkship. There were no exclusion criteria at any stage of the study.

In the initial stage, printed questionnaires were distributed to students by their teachers during lectures or practical lessons on a voluntary basis. Response rates ranged from 81.1% in Serbia to 44.8% in Albania. The second stage was conducted online due to the constraints imposed by the COVID-19 pandemic. Students received links to the web-based questionnaire through their associations. Response rates decreased in all countries except Bulgaria, where the rate was 97.1%. The lowest response rate in the second stage was 16.2% in Moldova.

Participation in the study was voluntary, with students being informed of their right to decline involvement, as well ensuring the confidentiality and anonymity of both students and their responses. The study received approval from the ethics committees of the participating universities.

2.4 Study measures

The questionnaire collected basic sociodemographic data, including age, gender and year of study. To assess stigmatising attitudes, two instruments were used: the Attribution Questionnaire (AQ-9) and The Mental Illness Clinicians' Attitudes (MICA-2).

The AQ-9 measures medical students' stigma by addressing nine stereotypes about individuals with mental illness, using a Likert scale ranging from 1 to 9. Higher scores indicate more stigmatising attitudes (30, 31).

The MICA-2 is a 16-item scale that measures attitudes towards psychiatry and mental health, perceptions of recovery and the dangerousness of individuals with mental illness, comfort levels around these individuals and discriminatory behaviour. Scores range from 1 to 6, with higher total scores indicating more stigmatising attitudes (32).

Both questionnaires underwent back-translation into the national languages of the countries involved (Albanian, Bulgarian, Romanian and Serbian), ensuring linguistic and cultural relevance. Cronbach's alpha values were satisfactory across three measurements, indicating acceptable internal consistency.

2.5 Statistical analysis

Standard methods of descriptive and inferential statistics were used. Numerical data were presented as mean (M) and standard deviation (SD), while categorical characteristics were depicted through frequency distributions. Univariate analyses were performed using Pearson's χ^2 test, Student's t-test, and χ^2 (ANOVA).

Binary logistic regression (Enter method) was used to assess the relationship between stigma and independent variables (gender, year of study and country). Crude and adjusted Odds Ratios (OR and AOR) were calculated. The independent variables, such as gender and year of study, were selected for the multivariable analysis model based on empirical variable selection, while the country variable was included based on the study's objectives. The AQ-9 score and MICA-2 scores as dependent variables were dichotomized around the median of the total sample into two categorical variables: AQ-9 scores were classified as low (9-35) or high (36 and above), and MICA-2 scores were classified as low (16-51) or high (52 and above). This analysis focused on the initial stage of the research (academic year 2015/2016) and Serbia was selected as the reference country due to its lowest average AQ-9 and MICA-2 scores.

Significance level was set at $p < 0.05$. Statistical analyses were conducted using IBM SPSS Statistics 23.

3 RESULTS

The study initially involved 1,526 students, with 614 students participating in the subsequent stage. Women comprised the majority in both stages, representing 72.0% and 74.4% of the participants, respectively (Table 1).

Table 1. Characteristics of the study samples.

| Characteristics | Albania n (%) | Bulgaria n (%) | Moldova n (%) | Romania n (%) | Serbia n (%) | Total n (%) |
|---|----------------|----------------|----------------|----------------|----------------|----------------|
| 2015/2016 | | | | | | |
| Gender | | | | | | |
| Men | 52 (22.0) | 68 (28.0) | 74 (23.6) | 127 (31.9) | 106 (31.6) | 427 (28.0) |
| Women | 184 (78.0) | 175 (72.0) | 240 (76.4) | 271 (68.1) | 229 (68.4) | 1099 (72.0) |
| Year of study | | | | | | |
| First | 126 (53.4) | 111 (45.7) | 229 (72.9) | 207 (52.0) | 187 (55.8) | 860 (56.4) |
| Final | 110 (46.6) | 132 (54.3) | 85 (27.1) | 191 (48.0) | 148 (44.2) | 666 (43.6) |
| Total | 236 (100.0) | 243 (100.0) | 314 (100.0) | 398 (100.0) | 335 (100.0) | 1526 (100.0) |
| Age (years, M\pmSD) | 21.5 \pm 2.7 | 22.2 \pm 3.2 | 20.8 \pm 2.6 | 21.8 \pm 2.9 | 21.3 \pm 2.5 | 21.5 \pm 2.8 |
| 2020/2021 | | | | | | |
| Gender | | | | | | |
| Men | 21 (18.4) | 45 (44.6) | 24 (27.0) | 40 (19.7) | 27 (25.2) | 157 (25.6) |
| Women | 93 (81.6) | 56 (55.4) | 65 (73.0) | 163 (80.3) | 80 (74.8) | 457 (74.4) |
| Total | 114 (100.0) | 101 (100.0) | 89 (100.0) | 203 (100.0) | 107 (100.0) | 614 (100.0) |
| Age (years, M\pmSD) | 24.3 \pm 1.6 | 24.1 \pm 2.0 | 25.0 \pm 2.0 | 24.9 \pm 1.4 | 25.3 \pm 1.7 | 24.8 \pm 1.7 |

In the first stage, the average AQ-9 score for first-year students across all countries was 35.2, compared to 35.0 for final-year students. In the second stage, the average score was 32.7. Regarding gender, a significant difference was observed among Moldovan students in their final year of 2015/2016 ($p=0.011$), which was not observed in other countries. Analysis by research year revealed that final-year students had lower AQ-9 scores compared to first-year students in Albania ($p<0.05$) and Bulgaria ($p<0.001$) during the first stage. Conversely, Moldovan final-year students had significantly higher scores in the first stage ($p<0.001$). Additionally, a comparison between AQ-9 scores of first-year students in 2015/2016 and those who completed a psychiatry course in 2020/2021 showed a significant decrease in Bulgaria (from 42.1 to 33.2, $p<0.001$) and Romania (from 37.1 to 33.1, $p<0.001$) (Table 2).

In the first stage, the average MICA-2 score for first-year students across all countries was 50.6, while for final-year students it was 49.1. In the second stage, the average score decreased to 45.6. Significant gender-based differences were found in Serbia in the second stage, with female scores being significantly lower than male scores (34.5 vs. 39.2; $p=0.007$). During the first stage, significant differences between first and final-year students were observed in Albania, Bulgaria and Romania. When comparing MICA-2 scores between first-year students in 2015/2016 and those in their final year in 2020/2021, significant differences were detected in all countries except Albania (Table 2).

Table 2. AQ-9 and MICA-2 scores measured among medical students.

| Characteristics | AQ-9 | | | MICA-2 | | |
|------------------------|------|------|--------|--------|-----|--------|
| | M | SD | p^* | M | SD | p^* |
| Albania | | | | | | |
| First year (2015/2016) | 32.6 | 10.4 | 0.440 | 54.5 | 6.1 | 0.485 |
| Men | 34.3 | 10.0 | | 55.3 | 5.1 | |
| Women | | | | | | |
| Final year (2015/2016) | 30.2 | 8.8 | 0.668 | 52.3 | 6.3 | 0.714 |
| Men | 31.2 | 9.4 | | 52.8 | 6.0 | |
| Women | | | | | | |
| Final year (2020/2021) | 33.8 | 9.8 | 0.727 | 54.7 | 4.5 | 0.645 |
| Men | 32.9 | 11.2 | | 54.1 | 5.5 | |
| Women | | | | | | |
| First year (2015/2016) | 33.9 | 10.1 | 0.022 | 55.1 | 5.4 | <0.001 |
| Final year (2015/2016) | 31.0 | 9.2 | | 52.7 | 6.0 | |
| First year (2015/2016) | 33.9 | 10.1 | 0.550 | 55.1 | 5.4 | 0.187 |
| Final year (2020/2021) | 33.1 | 10.9 | | 54.2 | 5.3 | |
| Bulgaria | | | | | | |
| First year (2015/2016) | 42.4 | 10.8 | 0.888 | 59.2 | 7.0 | 0.929 |
| Men | 42.0 | 10.0 | | 59.0 | 9.0 | |
| Women | | | | | | |
| Final year (2015/2016) | 35.8 | 7.3 | 0.393 | 57.5 | 8.7 | 0.179 |
| Men | 37.0 | 8.4 | | 55.8 | 5.5 | |
| Women | | | | | | |
| Final year (2020/2021) | 32.3 | 8.2 | 0.352 | 50.6 | 7.4 | 0.288 |
| Men | 33.9 | 9.2 | | 52.3 | 7.6 | |
| Women | | | | | | |
| First year (2015/2016) | 42.1 | 10.1 | <0.001 | 59.1 | 8.7 | 0.010 |
| Final year (2015/2016) | 36.6 | 8.0 | | 56.5 | 6.9 | |
| First year (2015/2016) | 42.1 | 10.1 | <0.001 | 59.1 | 8.7 | <0.001 |
| Final year (2020/2021) | 33.2 | 8.7 | | 51.5 | 7.5 | |
| Moldova | | | | | | |
| First year (2015/2016) | | | | | | |
| Men | 35.5 | 10.6 | 0.477 | 52.9 | 6.4 | 0.181 |
| Women | 34.4 | 9.5 | | 51.6 | 6.1 | |
| Final year (2015/2016) | | | | | | |
| Men | 34.3 | 12.8 | 0.011 | 52.2 | 5.2 | 0.682 |

| Characteristics | AQ-9 | | | MICA-2 | | |
|------------------------|------|------|------------|--------|------|------------|
| | M | SD | <i>p</i> * | M | SD | <i>p</i> * |
| Women | 41.7 | 11.0 | | 51.7 | 5.2 | |
| Final year (2020/2021) | | | | | | |
| Men | 32.7 | 11.1 | 0.259 | 43.8 | 11.5 | 0.101 |
| Women | 35.9 | 12.0 | | 47.8 | 9.6 | |
| First year (2015/2016) | 34.7 | 9.8 | <0.001 | | | |
| Final year (2015/2016) | 39.8 | 11.9 | | 51.9 | 6.2 | 0.887 |
| First year (2015/2016) | 34.7 | 9.8 | 0.787 | 51.8 | 5.2 | |
| Last year (2020/2021) | 35.0 | 11.8 | | 51.9 | 6.2 | <0.001 |
| | | | | 46.7 | 10.2 | |
| Romania | | | | | | |
| First year (2015/2016) | | | | | | |
| Men | 36.9 | 9.4 | 0.805 | 52.2 | 8.4 | 0.100 |
| Women | 37.3 | 9.1 | | 50.1 | 9.0 | |
| Final year (2015/2016) | | | | | | |
| Men | 37.5 | 11.0 | 0.850 | 47.4 | 9.5 | 0.703 |
| Women | 37.8 | 10.5 | | 46.9 | 8.3 | |
| Final year (2020/2021) | | | | | | |
| Men | 34.1 | 10.9 | 0.517 | 43.7 | 7.2 | 0.292 |
| Women | 32.9 | 10.4 | | 42.4 | 6.5 | |
| First year (2015/2016) | 37.1 | 9.2 | 0.550 | 50.8 | 8.9 | <0.001 |
| Final year (2015/2016) | 37.7 | 10.6 | | 47.0 | 8.7 | |
| First year (2015/2016) | 37.1 | 9.2 | <0.001 | 50.8 | 8.9 | <0.001 |
| Final year (2020/2021) | 33.1 | 10.5 | | 42.7 | 6.7 | |
| Serbia | | | | | | |
| First year (2015/2016) | | | | | | |
| Men | 32.3 | 8.1 | 0.058 | 41.7 | 7.8 | 0.148 |
| Women | 29.6 | 9.6 | | 40.1 | 6.7 | |
| Final year (2015/2016) | | | | | | |
| Men | 28.6 | 7.0 | 0.092 | 41.1 | 5.7 | 0.921 |
| Women | 31.2 | 9.3 | | 41.0 | 7.8 | |
| Final year (2020/2021) | | | | | | |
| Men | 31.4 | 9.9 | 0.108 | 39.2 | 10.4 | 0.007 |
| Women | 28.6 | 7.1 | | 34.5 | 6.5 | |
| First year (2015/2016) | 30.5 | 9.2 | 0.924 | 40.6 | 7.0 | 0.589 |
| Final year (2015/2016) | 30.4 | 8.6 | | 41.0 | 7.2 | |
| First year (2015/2016) | 30.5 | 9.2 | 0.280 | 40.6 | 7.0 | <0.001 |
| Final year (2020/2021) | 29.3 | 8.0 | | 35.7 | 7.8 | |

**p*-Independent samples *t*-test

Analysis of AQ-9 scores across different academic years and countries indicated significant differences ($p < 0.05$) between study stages. Notably, the highest stigma levels, as measured by AQ-9, were observed among first-year students in Bulgaria (42.1), whereas the lowest score was found among final-year students in Serbia during the 2020/2021 academic year (29.3) (Table 3).

Comparative analysis of average MICA-2 scores across countries revealed significant differences in both research stages ($p < 0.001$). Initially, Bulgarian first-year students had the highest score (59.1), while in the subsequent stage, the highest score was observed among Albanian students (54.2). In both research stages, the lowest MICA-2 scores were observed in Serbia (Table 3).

Table 3. AQ-9 and MICA-2 scores between countries.

| Year of Study | | Albania | | Bulgaria | | Moldova | | Romania | | Serbia | | p * |
|---------------|-------|---------|------|----------|------|---------|------|---------|------|--------|-----|--------|
| | | M | SD | M | SD | M | SD | M | SD | M | SD | |
| AQ-9 | | | | | | | | | | | | |
| 2015/2016 | First | 33.9 | 10.1 | 42.1 | 10.1 | 34.7 | 9.8 | 37.1 | 9.2 | 30.5 | 9.2 | <0.001 |
| | Final | 31.0 | 9.2 | 36.6 | 8.0 | 39.8 | 11.9 | 37.7 | 10.6 | 30.4 | 8.6 | <0.001 |
| 2020/2021 | Final | 33.1 | 10.9 | 33.2 | 8.7 | 35.0 | 11.8 | 33.1 | 10.5 | 29.3 | 8.0 | 0.002 |
| MICA-2 | | | | | | | | | | | | |
| 2015/2016 | First | 55.1 | 5.4 | 59.1 | 8.7 | 51.9 | 6.2 | 50.8 | 8.9 | 40.6 | 7.0 | <0.001 |
| | Final | 52.7 | 6.0 | 56.5 | 7.0 | 51.8 | 5.2 | 47.0 | 8.7 | 41.0 | 7.2 | <0.001 |
| 2020/2021 | Final | 54.2 | 5.3 | 51.5 | 7.5 | 46.7 | 10.2 | 42.7 | 6.7 | 35.7 | 7.8 | <0.001 |

* p-ANOVA

Univariate analysis revealed that men had a higher prevalence of low AQ-9 scores (57.1%) compared to women (51.2%). Bulgarian students had the highest prevalence of AQ-9 scores above the median (62.1%), while Serbian students had the lowest (29.9%). Significant differences were observed in the prevalence of both low and high AQ-9 and MICA-2 scores between countries (Table 4).

The logistic regression analysis showed significant findings. Women had higher AQ-9 scores than men, with a significant crude odds ratio (OR=1.3, p=0.037). Final-year students had notably lower odds for high MICA-2 scores compared to first-year students (OR=0.8, p=0.021) (Table 5).

The multivariable regression analysis confirmed that female students were 30% more likely to have elevated AQ-9 scores compared to male students (p=0.029). However, no significant association was found between gender and MICA-2 scores. Completing psychiatry courses was associated with a 30% reduced likelihood of higher MICA-2 scores compared to first-year students (Table 6).

Table 5. Association between gender, year of study, country and AQ-9/MICA-2 scores in the first stage of the research (logistic regression—unadjusted OR).

| Year of Study | AQ-9 Score | | MICA-2 Score | |
|----------------------|---------------|---------|-------------------|---------|
| | OR (95% CI) | p | OR (95% CI) | p |
| Gender | | | | |
| Men | 1 | | 1 | |
| Women | 1.3 (1.0-1.6) | 0.037 | 1.1 (0.9-1.4) | 0.291 |
| Year of study | | | | |
| First year | 1 | | 1 | |
| Final year | 1.0 (0.8-1.2) | 0.853 | 0.8 (0.6-1.0) | 0.021 |
| Country | | | | |
| Serbia | 1 | | 1 | |
| Albania | 1.4 (1.0-2.0) | 0.079 | 35.2 (21.6-57.5) | <0.0001 |
| Bulgaria | 3.9 (2.7-5.5) | <0.0001 | 75.0 (43.7-128.7) | <0.0001 |
| Moldova | 2.3 (1.7-3.2) | <0.0001 | 14.7 (9.4-23.0) | <0.0001 |
| Romania | 3.1 (2.2-4.2) | <0.0001 | 9.1 (5.9-14.0) | <0.0001 |

* p-Logistic Regression

Table 4. Association between gender, year of study, country and AQ-9/MICA-2 scores in the first stage of the research.

| Year of Study | AQ-9 Score | | | | | MICA-2 Score | | | | |
|----------------------|------------|------|------|------|--------|--------------|------|------|------|--------|
| | Low | | High | | p | Low | | High | | p |
| | n | % | n | % | | n | % | n | % | |
| Gender | | | | | | | | | | |
| Men | 244 | 57.1 | 183 | 42.9 | 0.040 | 238 | 55.7 | 189 | 44.3 | 0.332 |
| Women | 563 | 51.2 | 536 | 48.8 | | 582 | 53.0 | 517 | 47.0 | |
| Year of study | | | | | | | | | | |
| First | 453 | 52.7 | 407 | 47.3 | 0.877 | 444 | 51.6 | 416 | 48.4 | 0.063 |
| Final | 354 | 53.2 | 312 | 46.8 | | 376 | 56.5 | 290 | 43.5 | |
| Country | | | | | | | | | | |
| Albania | 149 | 63.1 | 87 | 36.9 | <0.001 | 74 | 31.4 | 162 | 68.6 | <0.001 |
| Bulgaria | 92 | 37.9 | 151 | 62.1 | | 39 | 16.0 | 204 | 84.0 | |
| Moldova | 158 | 50.3 | 156 | 49.7 | | 155 | 49.4 | 159 | 50.6 | |
| Romania | 173 | 43.5 | 225 | 56.5 | | 239 | 60.1 | 159 | 39.9 | |
| Serbia | 235 | 70.1 | 100 | 29.9 | | 313 | 93.4 | 22 | 6.6 | |

* p-Chi-Square Test

Table 6. Association between gender, year of study, country and AQ-9/MICA-2 scores in the first stage of the research (logistic regression—adjusted OR).

| Year of Study | AQ-9 Score | | MICA-2 Score | |
|----------------------|---------------|----------|-------------------|----------|
| | AOR (95% CI) | <i>p</i> | AOR (95% CI) | <i>p</i> |
| Gender | | | | |
| Men | 1 | | 1 | |
| Women | 1.3 (1.0-1.6) | 0.029 | 1.0 (0.7-1.3) | 0.805 |
| Year of study | | | | |
| First year | 1 | | 1 | |
| Final year | 1.0 (0.8-1.2) | 0.657 | 0.7 (0.5-0.9) | 0.002 |
| Country | | | | |
| Serbia | 1 | | 1 | |
| Albania | 1.3 (0.9-1.9) | 0.104 | 32.3 (19.3-54.1) | <0.001 |
| Bulgaria | 3.9 (2.7-5.5) | <0.001 | 79.8 (45.8-139.2) | <0.001 |
| Moldova | 2.3 (1.6-3.1) | <0.001 | 13.9 (8.5-22.6) | <0.001 |
| Romania | 3.1 (2.3-4.2) | <0.001 | 9.7 (6.0-15.7) | <0.001 |

4 DISCUSSION

The level of stigmatising attitudes measured among first-year medical students was not as high as expected (16, 25, 33), aligning with recent research findings from South Africa (34). Across all countries, the mean AQ-9 score for first-year students was 35.2, while in the second stage, the average score among final-year students decreased to 32.7, which is similar to a Portuguese study, where the AQ-9 score was 33.6 (35).

No significant difference in AQ-9 scores between genders was found across countries (except in Moldova), aligning with one previous study (35) but contradicting other studies that indicated lower stigma levels among female medical students (36-37). However, multivariable analysis of the initial stage revealed a higher likelihood for female students to show more pronounced stigmatising attitudes than their male counterparts, which was unexpected. One possible explanation for this difference is that females experience more internalised stigma compared to men (38), potentially leading to higher stigmatising attitudes toward others. Another factor could be that females are more likely to acknowledge and report psychological distress (39), which might result in a less positive attitude toward mental illnesses. Future research should explore these potential factors to better understand the underlying reasons for gender differences in stigmatising attitudes across countries involved in the study.

The average MICA-2 score for first-year students across all countries in the first stage of the study was 50.6, while for final-year students in the second stage, it was 45.6, indicating a significant difference. Several studies reported lower average MICA-2 scores compared to our findings. In Malaysia, the average score was 43.4 (40), while in Portugal, it ranged from 38.2 to 36.7 before and

after psychiatry and psychology courses (41). An Australian study showed an average score of 36.8 (42), while in India the average MICA-2 score was 42.4 (43). A study comparing various programmes in Spain and Chile found a MICA score of 40.2 among medical students, who exhibited more negative attitudes towards mental disorders compared to students in nursing, psychology, and occupational therapy programmes (44). Medical schools in Poland recorded a score of 41.1, with no significant difference based on psychiatry attendance (45).

In our study, Bulgarian students had the highest average MICA-2 score in the first stage, regardless of their year of study, while students from Albania recorded the highest average score in the second stage. The most substantial decrease in MICA-2 score between stages was observed in Romania (from 50.8 to 42.7). Multivariable analysis showed that final-year students had a significantly lower likelihood of having higher MICA-2 scores compared to first-year students (OR=0.7), which is similar to an Australian study, where the baseline MICA-2 score was 48.2 and decreased to 43.5 after psychiatry classes (20). Other studies also support this, indicating that increased knowledge and exposure to patients with mental disorders positively affect stigma levels (22, 40, 41).

Furthermore, existing literature suggests that educational interventions aim to foster positive shifts in medical students' attitudes toward psychiatry, indicating that clerkships generally have a beneficial impact on students' attitudes in this field. This shift in attitude is evidenced by an increasing perception among students of psychiatry as a scientifically growing area of medicine, with significant effectiveness in psychiatric treatments (46).

In contrast to our findings, research conducted among medical university students in 65 countries worldwide reported an average MICA-2 score of 40.5, with no statistically significant difference based on attendance in psychiatry lectures (47).

Regarding gender, a significant difference in MICA-2 score was observed only in Serbia during the second stage of our research, with males exhibiting higher scores than females. Some studies confirm more stigmatising attitudes among men (43, 44), others report no significant gender differences (40, 41), while in Australia female students had higher scores compared to males (42).

Based on our findings and the existing literature, future research on stigmatising attitudes among healthcare professionals, particularly medical students, should explore several key areas: longitudinal comparative studies, examining attitude shifts across various stages of medical education and within different geographical and educational settings, as well as the inclusion of more variables that might influence student attitudes. Additionally, our study suggests that psychiatric training

during medical school has a noticeable positive influence on attitudes, an effect that could be further enhanced by incorporating specific lectures focused on stigma into the curriculum.

4.1 Limitations of the study

The selection of medical faculties was based on established research collaborations, which may not represent the overall student population in these five countries, thereby limiting the generalisability of the results. The relatively low response rates, particularly in Albania and Moldova, could be attributed to the strictly voluntary nature of our study, cultural differences and external factors such as COVID-19 restrictions. These response rates may affect the sample's representativeness, potentially introducing bias if respondents differ from non-respondents. Due to data collection constraints, we were unable to conduct a non-respondent analysis. These limitations highlight the need for future research on a larger and more representative sample.

Variations in the psychiatry curriculum, including the timing of students' attendance of psychiatry classes, led to differing intervals between psychiatry rotations and data collection periods. The preservation of anonymity prevented more detailed correlation analyses between first-year students from the initial stage and students from the subsequent stage of the research. Another limitation of our study is the potential bias introduced by self-report measures, such as social desirability and subjective interpretation. In order to reduce this bias, we used valid instruments with good internal consistency, provided clear instructions to participants and ensured anonymity. One factor that could potentially influence the results of the study is the different modes of data collection used in the two study stages (mode effect). In the first stage we used printed questionnaires, while the second stage employed an online survey method due to the COVID-19 pandemic restrictions. If the second stage of the research had been postponed to maintain consistency in the survey method, the students who were in their first year during the initial stage of the research would have been missed. The hybrid nature of psychiatry classes during the COVID-19 pandemic might have affected the quality and scope of the classes, as well as contact with patients, potentially impacting the level of stigma among students in the second stage of the research.

While our study provides insights into stigmatising attitudes among medical students from five South-Eastern European countries, future research could include broader populations of other future healthcare professionals (e.g. dentists, pharmacists, nurses) or different settings to enhance the generalisability of the results.

5 CONCLUSIONS

Our study revealed significant differences in stigmatising attitudes towards individuals with mental health conditions among medical students from the five countries involved. Despite initially high levels of stigma, psychiatry clerkships generally had a positive impact, improving attitudes towards individuals with mental health conditions. Early recognition of existing stigmatising attitudes and intervention during medical education can help develop strategies to reduce stigma, fostering compassionate and informed care. Further research is crucial for analysing and comparing psychiatry curriculum content across these countries and for identifying areas for reducing stigma among medical students, including the introduction of tailored training programmes to address this issue.

CONFLICTS OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

FUNDING

The authors received no financial support for the research, authorship and/or publication of this article.

ETHICS APPROVAL

This study was approved by the Committee of Ethics and Academic and Scientific Deontology of the University of Medicine and Pharmacy of Craiova, Romania (approval no. 15) on February 26, 2016. This research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

AVAILABILITY OF DATA AND MATERIALS

All data and materials used in this study are available upon reasonable request.

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