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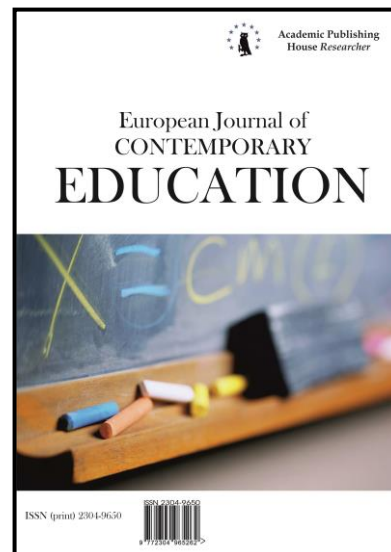
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Is Gender-Based Approach Applicable to the Development of Medical Students' Emotional Intelligence and Empathic Abilities as Key Professional Competences for an Aspiring Physician?

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Abstract

Emotional intelligence (EI) and empathy are important for doctor's work. But is there a place for a gender approach to develop the qualities? The aim of the research was to evaluate EI and empathic abilities (EA) in medical students through their gender to streamline the learning process and to develop professional competencies more effectively. The research included 104 medical students, 34 men and 70 women. Analysis of gender, cumulative and partial EI and EA was done by Bem, Hall and Boiko self-questionnaires respectively. IBM STATISTICA 8.0 was used for statistical analysis. Regardless of gender, most of the students had an average and a low level of EI with "managing your emotions" found to be the weakest. Males had higher cumulative EI and significantly better developed "managing your emotions" and "self-motivation". Females had higher empathy level. All students had understated cumulative EA level. Rational channel, emotional channel, intuitive channel were the weakest. Cumulative EA level was significantly higher in females as well as levels of rational channel, emotional drip, intuitive channel, attitudes that promote empathy. All respondents have a potential to develop EI and EA by the weakest components improvement such as "managing your emotions", rational, emotional and intuitive channels. Gender differences determine the need to develop self-motivation in females and empathy in males at high medical school. Gender approach may promote universal and professional competencies of aspiring physician.

Keywords: gender, professional competencies, emotional intelligence, empathic abilities, medical students, higher medical education.

1. Introduction

Higher medical education is undergoing considerable changes that include an important shift of focus from the learning process, i.e., tuition proper, to its resultant competences (Harden, Lejdlou, 2021). Outcome-based education (OBE) is "a method for elaborating, developing, implementing and documenting educational recommendations in the perspective of the goals set

and outcomes expected” (Spady, 1994). As regards medical education, this means forming competences that contribute to being a “good doctor” and include not only clinical skills but what is called 'soft skills' and personality traits that one needs to be a professional.

A high level of emotional intelligence (EI) and empathic abilities is especially needed for clinical disciplines that involve not only communication with the patient and their relatives but also multi-disciplinary teamwork and engagements with junior and medium-level medical personnel, the managers and others, for it is instrumental to efficient communication and, consequently, to the patient's adherence to the therapy prescribed and to its ultimate success. Importantly, successful communication may become the keystone of the assessment of the physician's efficiency as part of the patient-oriented approach that is now gaining ground in modern health systems.

Professional training of medical students usually aims to develop certain level of knowledge, skills, and abilities, while emotional aspects are only indirectly covered by the tuition process, as the student watches the behaviour and emotions of medical teachers, physicians, nurses and the patient and his/her relatives during clinical externship classes and analyses the information thus obtained. Consequently, developing the medical student's emotional may become a most relevant objective of contemporary higher medical education, and studies of aspiring physicians' emotional intelligence and empathic abilities become especially important.

Various authors have found EI emergence and improvement to depend on various biological and social factors, including gender (Saeed et al., 2020; Malinauskas et al., 2018; Cabello et al., 2016).

Gender is a definition of men and women based on their social roles in the family and society (Gender equality guidelines..., 2019). In social science perspective, the gender approach aims to create a situation that promotes equal opportunities and life chances for both men and women, particularly in the field of health care. Thus, since 2002 WHO-initiated conferences are regularly held to assess the influence of gender on health personnel's careers, social status and psychological well-being; WHO used their findings to formulate lists of key gender competences of a physician and healthcare manager (Integrating gender..., 2006).

Gender approach more narrowly understood has long been used in clinical medicine, as men's and women's physiological features affect their predisposition to certain diseases and their course. Besides, the gender aspects of diseases and their treatment have been included in medical university curricula both in Russia and worldwide. However, the gender approach remains insufficiently studied in higher education generally and medical education in particular, while having shown its efficiency in schooling and pre-school education (Baurova, 2010).

Notably, one's gender is of paramount personal importance for health workers. Thus, it has been proved to play a role in medical students' professional orientation, with male students preferring surgical specialities and females choosing therapeutical ones (Pagotto et al., 2020). Some authors establish a link between gender and some mental health issues, including emotional burn-out, depression, and suicide among doctors of various specialities. Thus, a largest-scale survey by S. Pospos et al. (2019) that covered 450 physicians and medical residents found male respondents to have experienced suicide thoughts, anger, and alcohol abuse more often, while female doctors usually cited anxiety, annoyance or depression (Pospos et al., 2019). Gender thus has a considerable effect on both social responses and on the realisation of medical workers' social roles. However, the necessity and efficiency of gender approach to the development of psychological personality aspects that are professionally important for physicians (emotional intelligence and empathy in particular) have almost never been studied.

Empathy, or compassion, is understood to mean emotional responsiveness, attention to other people, their feelings and problems, (Meshcheryakov, Zinchenko, 2004), i.e., reflects a desire to assist and support. Clinical empathy is the physician's ability to: (1) understand the patient's situation and feelings; (2) show an understanding of their feelings and emotions; and (3) render medical assistance taking into account the patient's concerns and anxiety (Mercer, Reynolds, 2002). S. Steinhausen and al. (Steinhausen et al., 2014) found that patients who believed their doctors to be highly empathic had a 20-fold higher probability of better medical treatment outcomes.

To understand others' emotions and to control one's own, to be sympathetic, to listen and hear are all abilities of professional importance to doctors. A high level of EI and empathic abilities is directly correlated to building the patient's confidence which, in turn, has an influence on prognosis and on the patient's satisfaction with the medical service provided (Weng, 2008). In this connection, leading accrediting agencies of the U.S., British, Canadian and Chinese health systems

rate successful communication, characteristic of persons with a high level of EI, as a key professional competence of a highly skilled physician. (Core Committee..., 2002). The Royal College of Physicians and Surgeons of Canada emphasizes the physician's functions of a communicator ("communicates effectively with patients, families, physicians and other colleagues in the health care profession") and collaborator (works effectively in a medical professionals' team) on an equal footing with such roles as being a medical expert, health advocate, leader, scholar, and professional (Frank et al., 2015). In Russia, this competence is mentioned in the new Federal State Educational Standard, FSES₃₊₊ (2020) that lists "Teamwork and leadership" and "Communication" among a specialist physician's universal competences. (Federal'nyj gosudarstvennyj..., 2020).

Awareness of EI importance for a physician prompted active research into this phenomenon with respect to medical students. In their study, to which this paper is a sequel, M.V. Vetluzhskaya et al. showed medical students aged 19 to 30 to generally have a low level of EI, which suggests it must be developed (Vetluzhskaya et al., 2019), while high EI was shown to be correlated to excellent academic performance at the medical university (Aithal et al., 2016; Ranasinghe et al., 2017) and to predict a successful medical career, in therapeutical and surgical specialities alike (Urquijo et al., 2019; Thacoor et al., 2020). On the other hand, most authors report a decrease of medical students' EI in the course of their studies, (Triffaux et al., 2019; Papageorgiou et al., 2018), probably resulting from overload and emotional burn-out and from insufficient psychological and paedagogical support at higher medical schools (Hill et al., 2018).

D. Lin et al. (Lin et al., 2016) found resident surgeons with high EI to have a veritably lower incidence of de-personalisation, depression or emotional burn-out. EI is thus directly related to a medical student's, resident's or physician's mental and physical health (Sataloff, 2020).

Notably, EI formation passes through some age-related stages that coincide, to an extent, with Erikson's age periods (Orenstein et al., 2021). Thus, the young adulthood or early maturity stage that 3rd year students enter features an emerging ability to trust others and reach a compromise, while empathy remains dominant as an adequate emotional response to external influences – which essentially lays a foundation for the individual's emotional culture that will manifest itself in mature age. Research into this age group's EI and empathic abilities is thus of the greatest interest, especially because EI structure can be corrected in the process and under the influence of continued studies at the university.

The available information about gender-related specifics of EI and empathic abilities in general, and medical students in particular, is rather contradictory. According to most studies, medical students' integrative EI level was unrelated to gender (Shahin, 2020; Imran et al., 2013; Vasefia et al., 2018; Sundararajan et al., 2018), while students aged 17 to 25 showed low or medium EI no matter what higher school (medical, technical, or humanities) they were studying at (Alaeva et al., 2016). However, some authors found gender distinctions in EI structure. Studies done in Great Britain, Ireland, and India found female students' EI to be veritably higher (Saeed et al., 2020; Wijekoon et al., 2017; Arora et al., 2010; Kumar et al., 2016), while Australian researchers showed the same for male students (Doherty et al., 2013). That may result from some specifics of culture, education and social status of men and women in different countries. In some papers, veritable gender differences in EI structure were established. Thus, O.V. Gribkova (Gribkova, 2014) and N.V. Bibarsova (Bibarsova, 2017) showed male students aged 17 to 25 to have a veritable higher level of "control of their own emotions", which might result from the society's gender precepts, with more reserved manifestation of feelings expected of men. However, the relation of Russian medical students' EI components to gender has almost never been studied.

The information is more uniform regarding gender-related empathy. Women generally show a higher level of empathy, which is their leading ability in EI structure (Yu et al., 2020). Also, according to Calzadilla-Nunz A. and others, female students' level of empathy decreases less markedly than males' as they study at a medical university (Calzadilla-Núñez et al., 2017).

Contradictory information about the influence of gender on Russian medical students' EI and empathic abilities make it relevant to study those parameters in order to improve the quality of aspiring physicians' professional training.

The purpose of this study is to inquire into medical students' emotional intelligence and empathic abilities in gender perspective in order to improve the learning process and to efficiently shape their professional competences.

2. Materials and methods

The survey involved 104 3rd year students of the Sechenov Medical University, aged 20,5±1,6 on average. The participants were recruited between 2018 and 2020 inclusive. All the students agreed to participate and consented to the analysis and use of the data obtained. Their gender identities were found out using S. Bem's Sex Role Inventory consisting of 60 questions (Oprosnik..., 1974). All the students were divided into two gender groups (34 males and 70 females) and had their emotional intelligence and empathic abilities levels established through self-polling. The medical students' emotional intelligence status was assessed using N. Hall's technique (as adapted by Ye.P. Ilyin (Ilyin, 2001)) that consists of 30 questions and includes five scales: Emotional awareness, Managing your emotions, Self-motivation, Empathy, and Managing the emotions of other people. Analysed were both integrative EI (on the following scale: 70 or more points – high, 40 to 69 – medium; 39 or less – low), and partial (i.e., component) EI levels: 14 or more points – high, 8 to 13 – medium; 7 or less – low. Empathic abilities were assessed using V.V. Boyko's technique (Ilyin, 2011) that consists of 36 questions for analysis of empathy in general and its individual parameters: rational, emotional or intuitive channel, attitudes that promote or inhibit empathy, penetrability of empathy and identification of empathy. The results of the survey were used to establish and rank the consolidated figure depending on the score: 30 or more points – very high, 29–22 – medium, 21–15 – lowered, 14 or fewer – very low, and the significance of each specific parameter in the structure of empathy on a 0 to 6 points scale.

The impact of EI and empathic abilities on professional orientation, i.e., choices among clinical or non-clinical disciplines, were studied separately.

Statistical analysis of the data obtained was performed using STATISTICA 8.0 software. Based on the sample size the value of alpha was set 0.05. Categorical variables were described with absolute values and percentages. The Chi-Square statistic was used to evaluate relationships between categorical variables. Statistical analysis of independent groups was done using the Mann-Whitney U test. The differences were considered significant with $p < 0,05$ probability.

3. Results

S. Bem's questionnaire showed most of our respondents, 81,4 % of female and 76,5 % of male students, to be androgynous type. 23,5 % of the men were diagnosed with masculine personality type, and 18,6 % of the women had feminine type. No discrepancy between gender and biological sex was thus found among the respondents.

The demographic profile of the groups being compared is shown in Table 1. The male and female students surveyed were of comparable age, and similar percentages of both groups combined their studies with employment and were willing to practise their profession after graduation. More female students than male ones were married (5,7 % and 0 % respectively), rented housing (22,9 % and 14,7 % respectively), lived in the city where they studied (90 % and 73,5 % respectively), and had better academic performance. The men were freer than female students to choose their professional orientation ("own choice" made by 100 % and 91,4 % respectively) and made a firmer/ more decided choice between clinical and non-clinical disciplines (5,9 % and 11,4 % "undecided" men and women, respectively).

Table 1. Demographic characteristics of the 3-year medical students

Characteristics	Men (n=34)	Women (n=70)
Age, years (M±δ)	20,4±0,9	20,6±1,8
Marital status	Single – 34 (100 %)	Married – 4 (5,7 %) Single – 66 (94,3 %)
Currently living	With parents – 25 (73,5 %) In hostel – 4 (11,8 %) Rent – 5 (14,7 %)	With parents – 40 (57,1 %) In hostel – 13 (18,6 %) Rent – 16 (22,9 %) Own apartment – 1 (1,4 %)

Place of living	Moscow – 25 (73,5 %) Moscow region – 9 (26,5 %)	Moscow – 63 (90 %) Moscow region – 5 (7,1 %) St. Petersburg – 2 (2,9 %)
Employment status	Employed – 11 (32,4 %) Unemployed – 23 (67,6 %)	Employed – 23 (32,9 %) Unemployed – 47 (67,1 %)
Choice of high school	Own choice – 34 (100 %)	Own choice – 64 (91,4 %) Parents' choice – 5 (7,1 %) Set of circumstances – 1 (1,4 %)
Future career choice	Medical-oriented – 31 (91,2 %) Other- oriented – 2 (5,9 %) I don't know – 1 (2,9 %)	Medical-oriented – 66 (94,3 %) Other- oriented – 1 (1,4 %) I don't know – 3 (4,3 %)
Academic performance	Excellent marks - 4 (11,8 %) Good marks - 7 (20,6 %) Satisfactory marks - 17 (50 %) Bad marks/retakes – 6 (17,6 %)	Excellent marks - 17 (24,3 %) Good marks - 26 (37,1 %) Satisfactory marks - 22 (31,4 %) Bad marks/retakes – 5 (7,1 %)
Choice of speciality	Clinical speciality – 27 (79,4%) Non-clinical speciality – 5 (14,7 %) Haven't decided yet – 2 (5,9 %)	Clinical speciality – 50 (71,4 %) Non-clinical speciality – 12 (17,1 %) Haven't decided yet – 8 (11,4 %)

No statistically significant difference was detected between male and female 3rd year medical students' integrative emotional intelligence. Most students presented with medium or low EI levels as shown in [Table 2](#).

Table 2. Gender differences in components of emotional intelligence among 3rd year medical students by Hall technique (Me [25-75 %]):

Component	Men (n=34)	Women (n=70)	z	p-level
EA	11 [6-13]	11,5 [8-14]	-0,86205	0,388660
MYE	7,5 [2-12]	-1,5 * [-7-7]	3,33576	0,000851*
SM	10 [8-14]	7 * [3-11]	2,44456	0,014503*
E	9 [6-13]	12 [7-14]	-1,64081	0,100837
MEOP	10 [4-13]	10,5 [6-14]	-0,77460	0,438579
Integrative (total) indicator	46 [31-57]	34 [26-51]	1,44508	0,148436

Note: EA – emotional awareness, MYE – managing your emotions, SM – self motivation, E – empathy, MEOP – managing the emotions of other people; * - $p < 0,05$.

However, male students had a higher integrative score of 46 points and included a higher percentage with medium EI and smaller with low EI as compared to women (52,9/28,6 % and 41,2/62,8 %, respectively) ([Figure 1](#)).

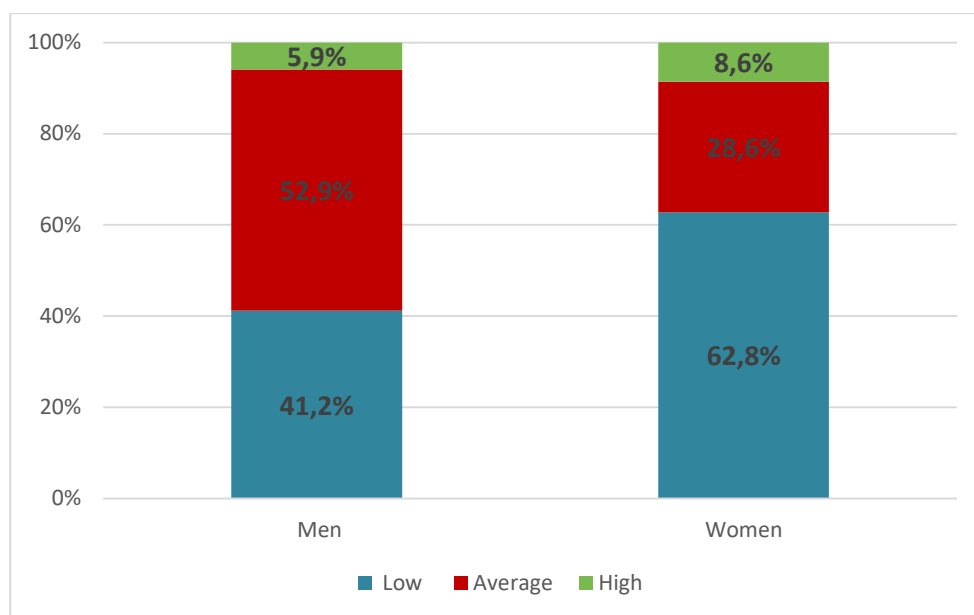
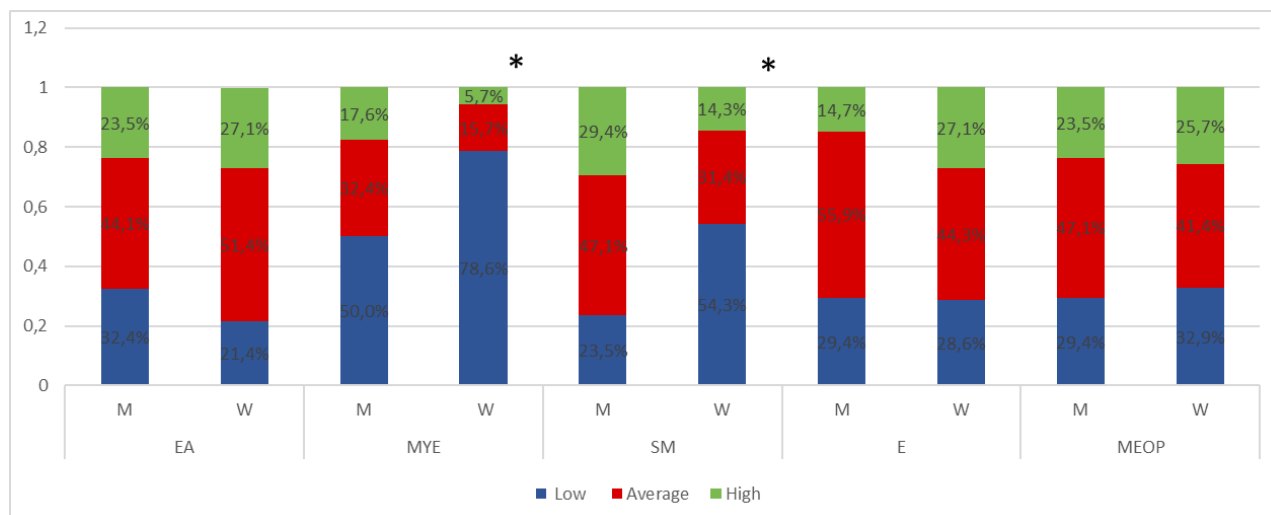


Fig. 1. Gender differences between of total cumulative EI levels among the 3rd year medical students

Research into the gender differences between 3rd year medical students' EI structures found the following features (Table 2). The average values of each of the five EI components did not exceed 12, i.e., failed to reach a high level, while women showed low levels of two parameters (MYE and SM). When ranked, women's "top three" components were E, EA and MEOP that scored 12, 11,5 and 10,5 points, respectively, and men's "top three" were EA, SM and MEOP with 11, 10 and 10 points, respectively. Women's least developed EI components were MYE and SM (-1,5 and 7 points, respectively), and men's – MYE and E (7,5 and 9 points, respectively). Respondents of either gender had a comparable average level of emotional awareness (11 points for men and 11,5 points for women) and management of the emotions of other people (10 points for men and 10,5 points for women), while women's empathy level was somewhat higher and men's level of management of their own emotions and self-motivation was veritably higher ($p < 0,05$).

Comparative analysis of the levels of EI components in the two groups showed that low EA is somewhat more frequent among men – in 32,4 % of cases as compared to 21,4 % of women, while medium to high levels are more often recorded among women (Figure 2). The relationship between gender and EA was not statistically significant. At a significance level of $p=0,0483$, the critical value of χ^2 was 1,457. Most of the women (78,6 %) and only 50 % of the men showed lower levels of MYE, while men had a higher percentage of medium and high levels of MYE. The relationship between gender and MYE was statistically significant. At a significance level of $p = 0,011$, the value of χ^2 was 9,082. By paired comparison of low and average as well as low and high levels of MYE the values of χ^2 were 5,611 (at a significance level of $p=0,018$) and 5,761 (at a significance level of $p=0,016$) respectively. Low self-motivation (SM) was characteristic of 54,3 % of women and 23,5 % of men; medium, of 31,4 % of women and 47,1 % of men; and high, of 14,3 of women and 29,4 % of men. The relationship between gender and SM was statistically significant. At a significance level of $p = 0,010$, the value of χ^2 was 9,147. By paired comparison of low and average as well as low and high levels of SM the values of χ^2 were 6,228 (at a significance level of $p=0,013$) and 7,473 (at a significance level of $p=0,006$) respectively. The percentage of men and women with low levels of empathy (E) was comparable, 29,4 % and 28,6 % respectively; however, low levels of this EI component were more frequent in men, 55,9 % (compared with 44,3 % of women), and high levels were found in 27,1 % of women (compared with 14,7 % of men). The relationship between gender and E was not statistically significant. At a significance level of $p = 0,336$, the critical value of χ^2 was 2,180. The incidence of low, medium and high levels of MEOP was virtually the same among both genders. The relationship between gender and MEOP was not statistically significant. At a significance level of $p = 0,862$, the critical value of χ^2 was 0,297.



Note: M – men, W – women, EA – emotional awareness, MYE – managing your emotions, SM – self motivation, E – empathy, MEOP – managing the emotions of other people; * - $p < 0,05$.

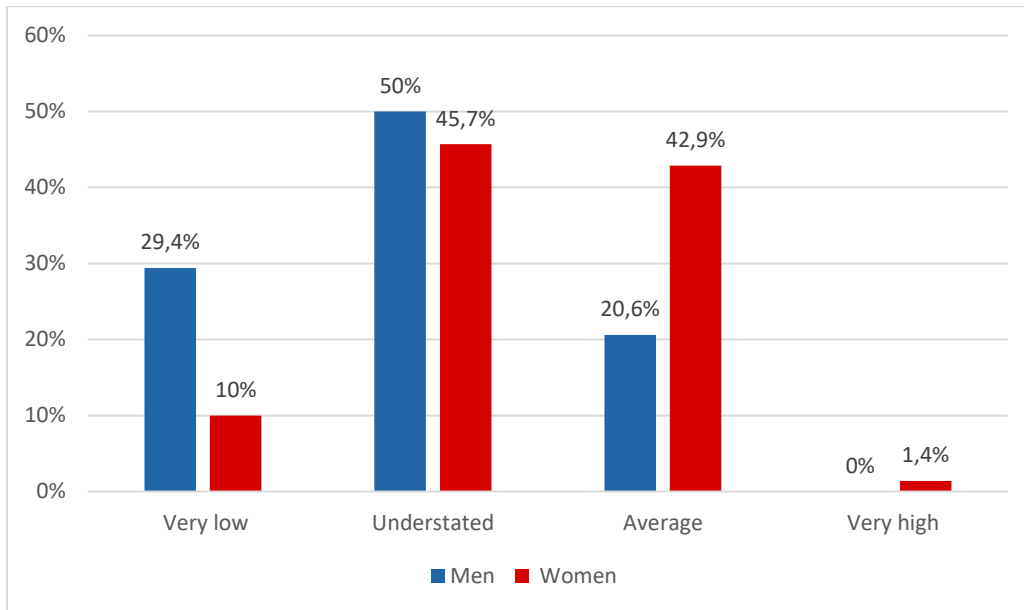
Fig. 2. Gender differences of partial EI levels distribution among 3rd year medical students (by Hall technique, %)

Medical students of both groups had a reduced average level of consolidated empathic abilities according to V.V. Boyko (Figure 3), but women’s level was veritably higher ($p < 0,05$) than men’s: 21 and 15,5 points, respectively (Table 3, Figure 3B).

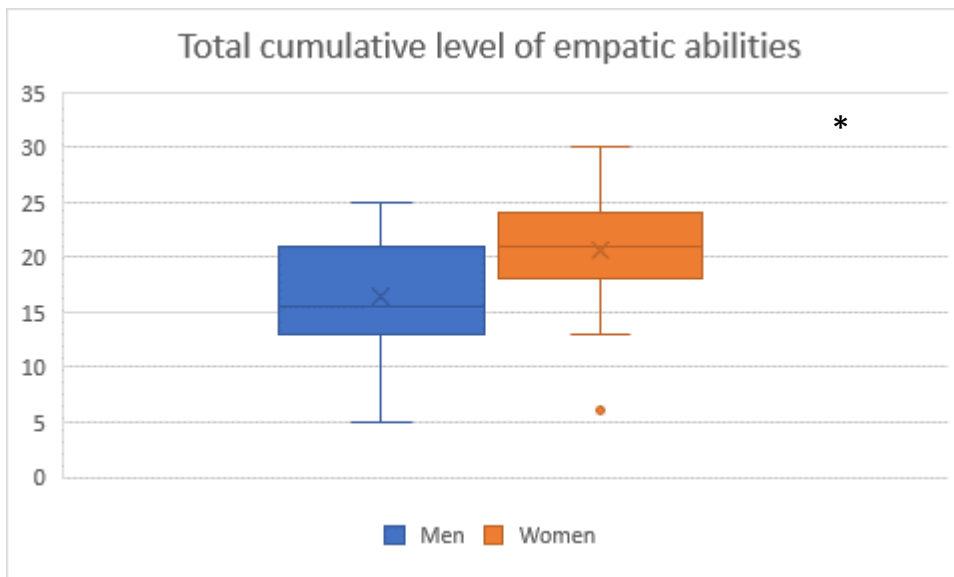
Table 3. Gender differences between levels of empathic abilities among 3rd year medical students as per V.V. Boyko’s questionnaire (Me [25-75 %]):

Component	Men (n=34)	Women (n=70)	z	p-level
RC	2 [2-3]	3 * [2-4]	-2,46693	0,013628*
EC	2 [1-3]	3 * [2-5]	-3,46133	0,000538*
IC	2 [1-2]	3 * [2-4]	-3,07674	0,002093*
APE	3 [2-4]	4 * [3-5]	-2,87578	0,004031*
PE	3-5 [2-4]	4 [3-4]	-0,80037	0,423498
IE	3.0 [2-4]	4 [3-5]	-1,57302	0,115716
Total cumulative level	15.5 [13-21]	21 * [18-24]	-3,86325	0,000112*

Note: RC – rational channel, EC – emotional channel, IC – intuitive channel, APE – attitudes that promote empathy, PE – penetrability of empathy, IE – identification in empathy; * - $p < 0,05$.



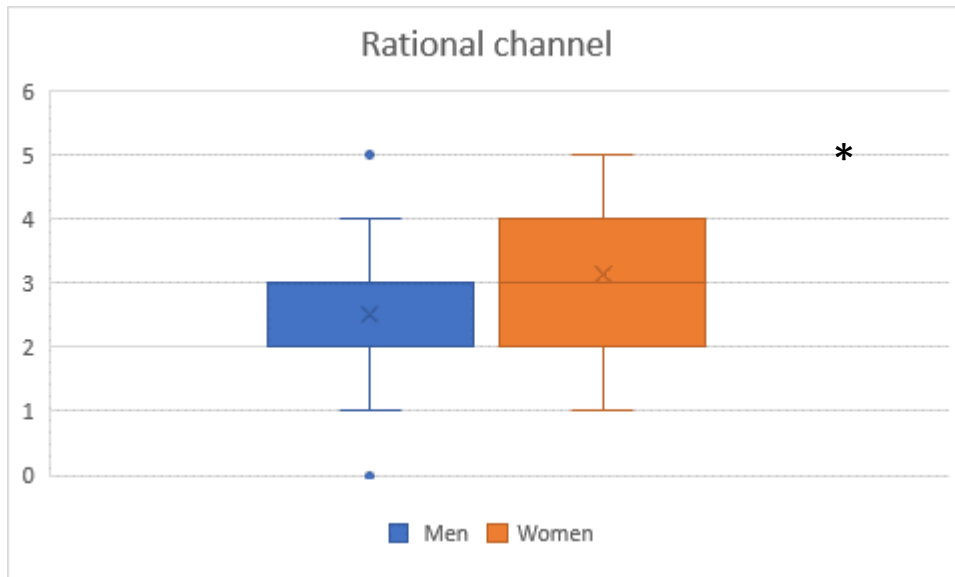
A)



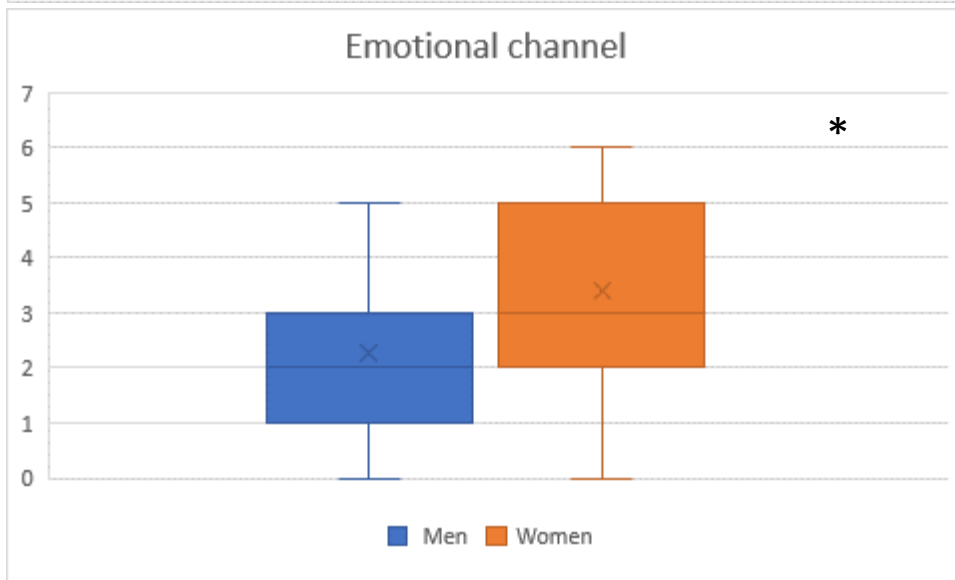
B)

Fig. 3. Gender differences between total cumulative levels of empathic abilities among 3rd year medical students (as per V.V. Boyko’s questionnaire)

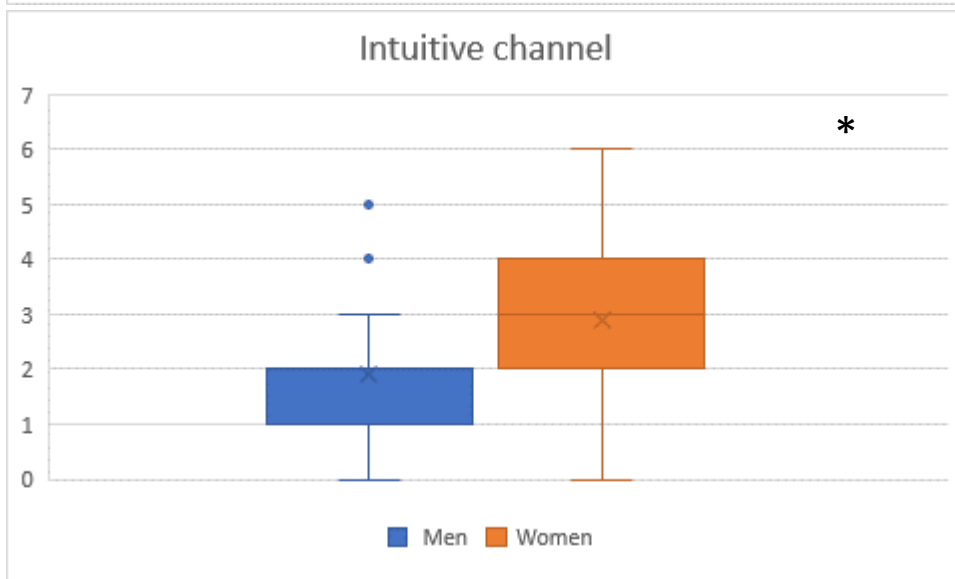
The most significant parameters in the structure of both men’s and women’s empathy were their attitudes that promote empathy (4 and 3 points, respectively), penetrability of empathy (4 and 3,5 points, respectively), and identification in empathy (4 and 3 points, respectively). And women’s rational, emotional and intuitive channels and “attitudes that promote empathy” were veritably ($p < 0,05$) more developed than men’s (Figure 4 A-D).



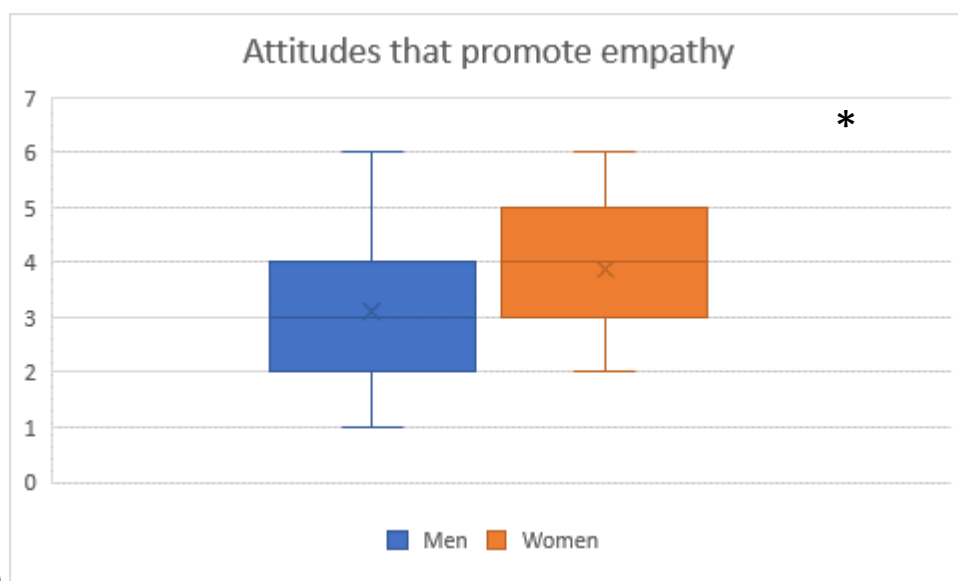
A)



B)



C)



D)

Note: * - $p < 0,05$.

Fig. 4. Gender differences in empathic ability components as per V.V. Boyko's questionnaire among 3rd year medical students

Fewer women had very low integrative levels of empathic abilities (10 %) and more had medium levels (42,9 %) as compared with 29,4 % and 20,6 % of men, respectively (Figure 3A). Very high empathy was found among women only, in 1,4 % of cases.

Analysis of the influence of EI and empathic abilities on the choice of the profession returned the following results. 90,4 % of those surveyed had made their choice, with 81,9 % of them choosing a clinical discipline and 18,1 % choosing a non-clinical one. At the time of the poll, 9,6 % of the students could choose neither speciality. The relationship between choice of the profession and integrative indicator of EI was not statistically significant. At a significance level of $p = 0,201$, the critical value of χ^2 was 5,974. However, as we compared Hall's integral EI, we found students who chose a non-clinical discipline to include fewer persons with medium EI level (29,4 %) and more with low EI level (64,7 %) than among those who had chosen a clinical speciality (40,3 % with medium and 50,6 % with low EI). Students who had difficulty choosing their speciality had even lower emotional intelligence levels (see Table 4), with 80 % showing low and 20 % showing medium EI. None of the respondents who had difficulty choosing their speciality had a high EI level.

Table 4. Distribution of integrative EI indicator levels among 3rd year medical students depending on their choice of future speciality (by Hall's technique, %)

Component	Choice of clinical speciality (n = 77)	Choice of non-clinical speciality (n = 17)	Haven't decided yet (n = 10)
Integrative (total) indicator	Low – 39 (50,6 %) Medium – 31 (40,3 %) High – 7 (9,1 %)	Low – 11 (64,7 %) Medium – 5(29,4 %) High – 1 (5,9 %)	Low – 8 (80 %) Medium – 2 (20 %) High – none

4. Discussion

Thus, 3rd year medical university students mostly demonstrated the androgynous type, i.e., a harmonious combination of masculine and feminine features. This is indicative of a high potential for adaptation in the social environment, which is particularly important in medicine and other professions that require interpersonal communication. These results correlate with the global trend for the spreading of androgynous type in the overall population (Lopukhova, 2013). No gender types were identified that were not typical of the biological sex of the respondents.

All the students involved in the survey, regardless their gender, demonstrated a medium or low EI level, which correlates with the findings of international and domestic researchers.

A medium EA level reflecting the awareness of the existence of various emotions and the ways they can manifest themselves, and overall understanding of own and others people's emotions shows that medical university students irrespective of their gender are capable of understanding and interpreting outward display of emotional reactions, which is critically important in interpersonal communications. The high frequency of high-level EA in females may be related to better identification of emotional non-verbal signals vs males (Bertakis et al., 1995), including the more developed brain areas responsible for emotional information analysis (Gur et al., 2002).

The medium and low levels MYE shown by men and women demonstrate an insufficiently developed habit of controlling, checking and regulating one's emotions. Similar findings were made in other surveys of this age group (Valiullina, 2020) irrespective of the university, which may be related to the psychological state of this age where the ability to handle one's emotions is only forming. At the same time, in our survey men showed a veritably better-developed EI. This may be caused by the influence of gender stereotypes formed in the family and society because boys/men are usually expected to be more reserved in displaying their feelings (Hentschel et al., 2019).

The medium and low self-motivation level in men and women demonstrate that medical university students need to improve their ability to control self-motivation in order to attain their goals, work on their self-discipline and on the ability to withstand temporary setbacks. Men had a veritably higher level of self-motivation, which reflects their ability to demonstrate willpower and perseverance in solving the problems and tasks at hand and their desire for self-control as part of gender role realization.

All the survey participants demonstrated a medium level of empathy that reflects the ability to feel and understand emotions of the people around and to relate to them. At the same time, female students demonstrated this particular EI component more often than males, which corresponds the results of Russian and international surveys (Yu et al., 2020; Hojat et al., 2018; Zhdanov et al., 2015). This phenomenon may be related both to the traditional upbringing of girls focused on developing empathy from an early age (playing dolls, helping with little brothers and sisters etc.) and to a certain gender expectation which a woman attempts to match and which implies that a higher demonstration of care in particular and empathy in general is a criterion of femininity.

Medical university students, both males and females, demonstrated a medium level of managing the emotions of other people, which shows the need for correct understanding of other people's feelings, interpretation of emotions displayed both verbally and non-verbally, and the ability to manage them in an effective manner.

The reduced total indicator of empathic ability according to Boyko in both groups under review demonstrates somewhat limited emotional responsiveness and empathy. These findings might reflect a certain trend for empathy lowering in course of the studies at the medical university, which corresponds to the results of 14 out of 30 surveys included in the largest of empathy in medical students (Andersen et al., 2020). The causes of the negative empathy trends may include a high stress level and sleep debt in medical students as factors increasing the emotional burn-out risk (Ludwig et al., 2015; Park et al., 2015). Also, reducing the level of empathic abilities may be a mechanism of defence against emotional overload in course of clinical practice and contacts with severe ill patients and their families, and reflect the predominant focus of clinical training on diagnosis and treatment tactics with no account for the doctor's psychological work (Morse et al., 2008), i.e., the insufficient formation of communication skills.

The rational channel that reflects spontaneous interest and focus on the partner along with the emotional channel demonstrating emotional intelligence and the ability to "tune in" to the emotions of the other person, and with the intuitive channel showing one's ability to interpret emotional reactions in a context of insufficient information (i.e., by intuition) proved to be the least important in the empathy structures both of male and female students, but the levels of these components were veritably higher in the latter group.

The attitudes promoting empathy that have a positive or negative effect on all the empathy channels were also better developed in women. Thus, the level of emotional responsiveness and empathic reactions in the female students involved in the survey depends significantly on their personal attitudes and own emotional background, and this can decrease the total empathic ability level significantly in the case of a low level of control over emotions.

Penetrative empathic ability that reflects a person's ability to elicit trust and willingness to communicate, and identification in empathy, which reflects one's ability to put oneself in the other's shoes, were the most significant parameters in the structure of medical students's empathy irrespective of their gender, although their mean score did not exceed 3,5-4 points, which shows a high potential for successful empathy and communication in future doctors.

In our work, empathy levels did not influence the respondents' future career choice, which may be due to the small sample size. However, it should be noted that some studies have found a correlation between the choice of future profession and the level of empathy: students with a higher empathy level preferred clinical disciplines, in which successful communication with patients and their relatives is of extreme importance (Teng et al., 2017; Li et al., 2018).

This may be one of the reasons for the higher share of female doctors in specialties such as paediatrics and family medicine (general practice), where greater patient care is expected: women have higher levels of empathy as an EI component and empathic abilities in general, so they show greater interest in the patient and their family, which contributes to better understanding and a closer empathic patient-physician relationship (Bertakis et al., 1995).

5. Conclusion

Thus, 3rd year medical students can, under favourable conditions, increase the integrative EI and empathic ability indicator and compensate/develop their individual components during their professional training at the university. Considering the differences in particular EI components between men and women that the survey found, it is essential to pay attention to raising the level of "managing your emotions" irrespective of the participant's gender. Furthermore, it would be advisable to hold classes aiming to develop self-motivation for female students, and to develop empathy for male students. This approach is in line with the current standards of student-oriented training, and it will not only raise the students' satisfaction with the quality of educational services but also improve the learning process efficiency. Considering the role of EI and empathic abilities in the doctor's work, we can recommend analysing these features in students coming to and then studying at the medical university so as to adjust one's individual learning trajectory with account for gender aspects and, possibly, one's need for psychological help in the diagnostics-based choice between clinical and non-clinical disciplines.

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