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Gender medicine attitudes among medical students: an Italian cross-sectional study

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Gender medicine attitudes among medical students: an Italian cross-sectional study

We aimed to explore attitudes and training experiences of medical students toward gender medicine (GM). A cross-sectional study with convenience sampling was conducted (sample size=430). To assess predictors of high GM consideration in patient management, a multivariable logistic regression was performed.

A total of 82% considered sex and gender important; 61% stated that they would use GM skills in their careers. A total of 76% had never discussed GM with their tutors, with differences between male and female students ($p=0.002$). Predictors of high GM consideration were: age (adjOR=1.4, 95% CI=1.1-1.8) and the impression that tutors considered patients' sex and gender during practice (adjOR=3.9, 95% CI=2.0-7.6).

Thus, participants considered GM important, but some students were unsure whether it could be useful in practice. The strongest predictor of high GM consideration was the tutors' good example during training. It would be advisable to implement the teaching of this topic during both courses and traineeships.

Keywords: gender medicine; education; medical students; attitudes.

Gender-specific medicine is an interdisciplinary dimension of medicine that studies the influence of sex, intended as biological differences, and gender, intended as socio-cultural differences, on individuals' health (Ministero della Salute 2016)(Ministero della Salute 2019).

The Italian Ministry of Health has adopted a specific plan (Ministero della Salute 2019) to insert this dimension of medicine in all medical specialties. However, this objective cannot be achieved without considering medical students (i.e. future healthcare professionals), who currently do not have an adequate training in gender-specific medicine. Although this topic has been investigated in an international setting, no studies are available on Italian medical students. Therefore, our aim was to investigate attitudes toward gender-specific medicine among Italian medical students. In addition, we assessed students' experiences during their academic training in relation to gender issues to explore potential associations between these experiences, gender medicine awareness, and attitudes, and to provide suggestions for innovative and improved training experiences.

Background

Gender-specific medicine is an interdisciplinary dimension of medicine that studies the influence of sex, intended as biological differences, and gender, intended as socio-cultural differences, on people's health. This influence involves not only etiology and physiopathology but also the areas of prevention, diagnosis, treatment, rehabilitation, and assistance.(Ministero della Salute 2016)(Ministero della Salute 2019)

Regarding the influence of sex, for instance, myocardial infarction has a lower incidence among pre-menopausal women but presents itself more often with atypical symptoms and increased mortality. On the other hand, post-menopausal women have a total cardiovascular risk comparable to that of men; hence menopause can be considered as a

cardiovascular risk factor for elder women.(Appelman et al. 2014)(Aggarwal et al. 2018) In addition, women have different pharmacokinetics due to hormonal, metabolic, and endocrine factors, which determine a different response to drugs and a higher incidence of drug-related adverse effects. Nevertheless, the vast majority of pharmacological clinical trials is still conducted mainly on men.(Whitley and Lindsey 2009)(Anno 2018)

In general, women are particularly disadvantaged. Authors from the University of Copenhagen showed that on average women receive medical diagnosis four years later than men, with inevitable consequences on the efficacy of therapies and prognosis.(Westergaard et al. 2019) However, gender differences have consequences for men too. For example, osteoporosis has always been considered mainly as a female disease, causing diagnostic delays and inadequate therapies in men patients.(Hernlund et al. 2013) Depression is more frequent among women, but commonly more severe in male patients, which show a higher risk of committing suicide.(Rutering et al. 2014)

Reaching gender equity in medicine has the potential to guarantee not only clinical but also economic and social advantages. In Italy, a milestone for gender-specific medicine should be considered the Law 3/2018, which focuses on gender medicine and establishes gender considerations as an integral part of medical practice in Italy, aiming for personalized and improved healthcare outcomes. The law mandates the spread of gender medicine in the National Health System and the inclusion of gender-specific approaches in healthcare (Baggio and Malorni 2019). Then, the Italian Ministry of Health has adopted a *Plan for the application and diffusion of Gender Specific Medicine*, (Ministero della Salute 2019) to insert this dimension of medicine in every medical specialty. However, in 2020, Grego and colleagues highlighted that gender medicine is still little known (Grego et al. 2020). The ambitious goal of integrating gender-specific medicine across all medical disciplines cannot be achieved without training the future healthcare professionals to a medical practice based

upon the principles of gender-specific medicine. These principles, however, are not adequately considered in medical training. It is therefore necessary to know how much future healthcare professionals, in particular current medical students, are acquainted with the importance of these issues for their future profession and how much predisposed they are to possible curricular implementation.

This topic has been investigated in an international setting, and a high consideration of gender medicine has emerged among European medical students,(Hamberg and Johansson 2006)(Andersson et al. 2012). US researchers underlined how gender medicine, despite being considered very important by medical students, was not still sufficiently implemented within the medical curriculum (Jenkins et al. 2016). Instead, medical students in Austria seemed to think that, despite recognizing the importance of gender medicine, a curricular implementation was not necessary (Harreiter et al. 2011). Despite the substantial sample size of over 600 participants in these studies, the disparities across medical schools and the broader healthcare system organization hinder the extrapolation of the results to different contexts, including the Italian scenario.

No similar information is available for Italian medical students. Hence, our purpose was to investigate attitudes toward gender-specific medicine among Italian medical students at the University of Turin. We also evaluated students' experiences during academic training concerning gender issues, to establish the existence of a potential relation between these experiences and gender medicine awareness and attitudes.

Materials and methods

In March 2020, an online cross-sectional survey was conducted among medical students at the University of Turin, a public university in Northern Italy. The medical school has around 60% of female students and offers both Italian-language and English-language courses. In this study, participants attending Italian-language courses were involved.

In Italy, medical school lasts six years. Generally, the first three years focus on biological subjects, and the last three focus on clinical subjects, with rotations in the hospital that usually begin at the 4th/5th year. Therefore, only students in the fifth and sixth years and outside the prescribed time (i.e. after the sixth year) were considered eligible for this study, as they already had attended clinical courses and traineeships in the wards. A total of 1258 students received an email explaining the background and purpose of the study and containing the link to the online questionnaire. All the participants agreed to give informed consent. Participation was voluntary and the researchers guaranteed the anonymity of the participants during data extraction and results analysis.

The questionnaire

After a review of the literature, a 29-item questionnaire was developed. In this paper, we analyze the socio-demographic characteristics of the sample, together with the results of two other parts of the questionnaire, one concerning the attitudes of the students towards gender medicine and the other regarding their personal training experiences on the topic of gender medicine. The other parts of the questionnaire are analyzed elsewhere (Bert et al., 2022).

The socio-demographic items are reported in Supplementary Table 1. In particular, we asked the students to self-report their health status, on a Likert scale from 1 (very poor) to 5 (very good). This variable was then dichotomized into “not good” (score 1 to 3) and “good/very good” (score 4-5). We also assessed if students and/or their relatives were affected by chronic disease. These items were chosen in order to establish a possible relationship between having had personal and/or familiar disease experiences with higher gender sensitivity. In addition, in the present paper, a score of knowledge was considered as an independent variable to explore the relationship between knowledge and attitudes. The score is described in the article by Bert et al. (2022). Such score was dichotomized into poor

knowledge (below the mean of the sample) and good knowledge (equal or above the mean of the sample).

Items concerning attitudes and personal academic experiences toward gender medicine are shown in Table 1 and Table 2. We assessed how much students considered gender medicine important, on a Likert Scale from 1 (not important) to 5 (very important). This variable was then dichotomized into “not important” (score 1 to 3) and “important” (score 4-5) and represented the outcome of the present study (i.e. “high consideration of gender medicine”). We also asked them to state which reason they thought was the most significant to emphasize the importance of gender medicine. In addition, we asked if students thought they would consider sex and gender during different scenarios in their future careers (i.e. prevention, history data collection, medical examination, diagnostics, and treatment). We explored if participants thought biological differences between men and women were considered in clinical practice and if, according to their experience, health care provided in hospital and territorial settings was closer to the needs of men or women. We asked if, after learning more skills about gender medicine, students thought they would surely use such skills in their careers.

Personal experiences during academic training were assessed by asking the students whether they have dealt with gender medicine issues during lessons (specifying during which course and if the teacher was a man or a woman) and during traineeships in the wards. We asked if, during traineeships, students had the impression that the tutor took into consideration sex and gender of patients. We also asked the students which are, in their opinion, the preferable ways to implement gender medicine teaching, and how much they considered important updating courses about gender medicine for doctors. Last, we asked if students have dealt with gender medicine issues outside University (specifying through which source).

Statistical analysis

Descriptive analyses were carried out for all the variables. The scalar variable (age) was expressed as mean and standard deviation (SD). All the other variables were reported as percentages and numbers for each category. To evaluate differences between groups defined by gender, Fisher's exact tests were calculated.

The prevalence of high consideration of gender medicine was calculated with a 95% bootstrap CI (simple random sampling method). Potential predictors of high consideration of gender medicine in patient management (i.e. our dependent variable) were explored through a multivariable logistic regression model. The covariates to be included in the model were selected using a stepwise forward selection process, with a univariate $p < 0.25$ as the main criterion (Hosmer, 1989). The independent variables included in the final model were: age; sex; year of course; marital status; self-reported health status; having a chronic disease; having familiarity for chronic disease; knowledge about gender medicine (poor/good); having dealt with gender medicine issues during lessons; having discussed with the tutor about the impact of sex and gender on patient management during traineeships; having the impression that the tutor took into consideration sex and gender of patients during clinical practice. Tests to see if self-reported health status, having a chronic disease, and familiarity for chronic disease met the assumption of collinearity indicated that multicollinearity was not a concern (self-reported health status: Tolerance = 0.947, VIF = 1.056; having a chronic disease: Tolerance = 0.939, VIF = 1.065; familiarity for chronic disease: Tolerance = 0.990, VIF = 1.010). Missing values were excluded by listwise deletion.

All analyses were performed with the STATA 13 software (SPSS 25 software for collinearity statistics), and a two-tailed p -value < 0.05 was considered to be statistically significant.

Results

Socio-demographic characteristics

A total of 430 students completed the online questionnaire. Overall, 294 (68.37%) were females and 136 (31.63%) were males. The sample mean age was 25.17 ± 2.14 . The mean age of women was 25.20 ± 2.26 and the mean age of men was 25.11 ± 1.86 ($p=0.689$). Most of the students (42.89%) were in their fifth year of medical school, while the others were almost equally divided between the sixth year (31.24%) and outside prescribed time (25.87%). The vast majority of the respondents were Italian, single, and had no children. Among them, 372 (86.51%) reported good or very good health status, while 312 (72.56%) had at least one relative affected by chronic diseases (Supplementary Table 1).

Attitudes and personal experience about Gender Medicine

A total of 82.0% (95% CI=78.5-85.5%) considered sex and gender important in patient management, but a smaller percentage (60.88% females and 52.99% males) stated that they would surely or probably use gender medicine skills in their future career, with no significant differences between males and females (Table 1).

Most of the students (89.12% females and 91.04% males) recognized the importance of gender medicine in order to guarantee appropriate and personalized care for every patient, and almost half of the participants (49.32% females and 45.19% males) stated that biological differences between men and women are considered in clinical practice, but only in the area of prevention (Table 1).

Regarding gender equity, 63.48% of females and 74.07% of males considered healthcare provided in hospitals and territorial settings to be equally close to the need of both men and women. When asked about the implementation of gender medicine skills in their future clinical practice, males appeared to be significantly more inclined to consider sex and gender in the areas of prevention (81.48% males vs 73.88% women, $p=0.043$), medical

examination (68.15% males vs 53.92% women, $p=0.004$) and treatment (70.15% males vs 59.04% females, $p=0.018$) (Table 1). [Table 1 near here]

Gender Medicine and Academic Training

Most of the students (62.24% females and 71.32% males) have dealt with gender medicine during lessons, at least sometimes, especially in the endocrinology and mental health courses. Regarding traineeships experiences in the wards, the majority of the students have never discussed gender medicine issues with their tutors, with a significant difference between males and females (75.77% females vs 58.69% males, $p=0.002$). In addition, male students had the impression that tutors considered the sex and gender of patients during clinical practice significantly more often than female students (42.42% males vs 36.52% females, $p=0.037$). On the other hand, female students considered updating courses about gender medicine for doctors very important significantly more than male students (83.56% females vs 69.17% males, $p=0.003$) (Table 2).

According to our sample, the best ways to integrate gender medicine in the training curriculum of future doctors was through the insertion of gender issues in existing disciplines and periodic simulation of clinical cases based on gender differences. Male rather than female students appeared to be more interested in being provided with material to study at home individually (13.53% males vs 6.23% females, $p=0.012$). More than half of the participants have been informed about gender medicine outside the university, especially through the internet and social media (Table 2). [Table 2 near here]

Multivariable analysis

Using a multivariable logistic regression model, we found that age ($p=0.013$) and having had the impression that the tutor took into consideration the sex and gender of patients during clinical practice ($p<0.001$) were the only potential predictors of high consideration of gender

medicine in patient management (Table 3). As age increases, the likelihood of having a high consideration of gender medicine in patient management also increases. [Table 3 near here]

Discussion

We aimed to assess the attitudes of medical students at the University of Turin towards gender-specific medicine. The vast majority of our sample considered gender medicine highly important, in particular, to guarantee appropriate and personalized care for every patient, not just women. It thus seems that our students are well acquainted with the importance of gender medicine for their future clinical practice. No significant differences between males and females were found, in line with the researchers of some studies conducted in different contexts. (Andersson et al. 2012) (Rrustemi et al. 2020) (Morais, Bernardes, and Verdonk 2020) However, other authors have found higher gender sensitivity among female students. (Hamberg and Johansson 2006) (Harreiter et al. 2011) The fact that in our sample males and females are equally sensitive to gender issues is promising, being a positive starting point for the implementation of gender medicine teaching.

Nevertheless, despite the majority of the students considered sex and gender important for clinical practice, a smaller number of students stated that they would surely or probably use gender medicine skills in their future careers. It could mean that some students consider gender medicine important on a theoretical level, but not so easily exploitable on a practical one. This gap is explainable noticing that about two-thirds of the respondents have dealt theoretically with gender medicine issues during lessons, but a far smaller amount of students have dealt with those issues at a practical level during ward frequentation, and less than half of the students had the impression that tutors took into consideration sex and gender of patients during clinical practice.

In addition, when asked if in their opinion biological differences between men and women are considered in clinical practice, almost half of the students answered “yes, but only

in prevention”. It is possible that, when answering this question, students mainly thought about screening programs specifically targeted at the female population, which are an important area of medicine with gender-specific differences. However, sex and gender have implications not only in prevention but also in diagnosis, treatment, rehabilitation, and assistance, involving all medical specialties, as demonstrated by a steadily growing body of evidence.(Ministero della Salute 2016)·(Appelman et al. 2014)·(Whitley and Lindsey 2009)·(Rutering et al. 2014)·(Doyal 2001)·(Shannon et al. 2019)·(Niv 2011)·(Wagner et al. 2019) Furthermore, the majority of our students stated that healthcare provided in hospital and territorial setting is equally close to the needs of men and women. However, recently, authors suggest that especially hospital-based care is far less satisfactory for women compared to men.(Teunissen, Rotink, and Lagro-Janssen 2016)·(De Waure et al. 2014) Maybe our students fail to perceive this difference because of a lack of training, and this gap is going to be deep-rooted and difficult to eliminate once the students will be full-trained doctors, thus explaining the gender inequalities affecting our healthcare system. Hence, besides implementing gender-specific education during elective courses, it is also crucial to teach the students how to think and treat patients in a gender-oriented way during their traineeships in the wards, in order to gain clinical abilities truly based on gender-specific skills.

Regarding experiences in the wards, a statistically significant difference emerged between male and female students, with male students having discussed gender issues with their tutors significantly more often than female ones. The same result was obtained regarding students’ impression that tutors considered the sex and gender of patients during clinical practice, which was significantly higher in male rather than female students. This could be consistent with the fact that, on the other hand, female students considered very important updating courses about gender medicine, significantly more than male students. These results could mean that, having had less gender-specific practical experience during their

traineeships, female students see more clearly the necessity to improve physicians' knowledge about gender-specific issues. It could also mean that male students are more attentive concerning gender-specific problems and more able to see, recognize and apply gender-specific skills in their future profession.

Another interesting difference between male and female students emerged in future students' consideration of sex and gender in different moments of the clinical practice, namely prevention, history data collection, medical examination, diagnostic, and treatment. A higher number of male students stated that they would consider the sex and gender of patients during each of those clinical moments, and this difference was statistically significant regarding prevention, medical examination, and treatment. These results suggest that female students, despite a better knowledge of gender medicine notions, seem to be less interested in applying those notions in a practical clinical setting. This is consistent with the results of the multivariable analysis, from which it emerged that better knowledge is not a predictor of higher consideration. Also, this insight highlights the possibility that female students might show less interest in gender-based practice, assuming their personal experiences make them feel knowledgeable enough. This aspect warrants further exploration in future studies.

The only predictors we found were increasing age and having had gender-oriented experiences during traineeships. Hence, students seem to gain better gender attitudes over time and with the accumulation of practical experiences with their tutors in the wards. However, we only interviewed students in the last years of medical university, so that each of them has had at least some clinical experience in the hospital. Hence, gender attitudes improving with age could mean that older students probably had more chances of clinical practice, or had better knowledge of gender medicine issues, or both. Further studies conducted among younger students attending first years of medical education are therefore

necessary, to establish the existence of significant differences between younger and older students regarding gender attitudes and knowledge, and the reason behind these differences.

Globally these results indicate that the most effective way to increase medical students' gender awareness and attitudes is through the implementation of practical experiences in direct contact with patients, together with the increase of notions-based gender-specific knowledge.

Theoretical knowledge remains essential and, as gender-specific medicine is not routinely taught during medical training, a curricular implementation is therefore needed. This is most true considering the fact that the majority of the students also acquired gender medicine information autonomously outside the university, especially through the internet and social media, pointing out that the presence of a cultural interest may not be adequately satisfied by academic curricula. However, only around 20% of the students considered necessary the creation of a specific regular gender medicine course, while more than 60% thought it to be preferable the insertion of gender issues in existing disciplines, and around 50% of the students stated that the organization of periodic simulations of clinical cases with gender differences would be ideal for the acquisition of gender medicine skills. Therefore, the increase of practical experiences from a gender perspective and the implementation of gender-specific teaching throughout elective courses should be considered, in order to lay the foundations for medical teaching truly based on the principles of gender medicine, training doctors that will be able to satisfy the unique needs of each specific patients. Numerous interventions have aimed to incorporate gender-aware perspectives into medical education. In their review, Valenzuela and Cartes highlighted that effective interventions emphasized case-based teaching, external resources, and continuous access to gender-related information. Recommendations included multidisciplinary research and sustained curriculum updates. Challenges for lasting change encompassed attitudes, time constraints, available resources,

and organizational support (Valenzuela and Cartes 2019). Interestingly, Bansal et al. proposed an innovative strategy through a feminist film-based intervention: notably, movies that exemplify feminist ideals applicable to clinical settings could enhance the capabilities of medical trainees in addressing complex global women's health issues intertwined with sociopolitical and structural factors (Bansal et al. 2022). Hence, there are multiple opportunities for interventions to be incorporated into the medical student curriculum. Future studies will need to investigate their effectiveness and suitability across diverse contexts.

Lastly, we would like to highlight that, as future physicians, students play also a crucial role in dismantling sexism and gender violence. By advocating for inclusive and equitable healthcare, challenging stereotypes, promoting patient autonomy regardless of gender, and raising awareness about the impacts of gender-based violence on health, they can contribute to a more just and compassionate medical environment. Additionally, they have the opportunity to engage in research, education, and policy initiatives that address these issues, fostering positive change in healthcare practices and outcomes.

Our study has some limitations. First, it was conducted on a convenient sample of students attending the last years of medical training. It would be interesting to know if there is a difference between students of the first and last year regarding attitudes toward gender medicine issues, in order to evaluate if practical clinical experiences can positively influence gender sensitivity. Secondly, our study is limited to the University of Turin. Further studies in different contexts are therefore required in order to confirm and strengthen our findings. In addition, just 430 students out of 1258 participated in this study. This could be a selection bias, meaning that only the students that already had an interest in gender medicine completed the questionnaire. However, the fact that the participation rate was so low strengthens the consideration that gender medicine is neglected among medical students and that a curricular implementation is highly advisable. Remarkably, we acknowledge the limitation that our

questionnaire primarily focuses on students' perspectives concerning biological differences. Therefore, it is imperative to conduct further assessments to explore medical students' attitudes towards socio-cultural differences and variations in lived experiences. Furthermore, it should be highlighted that students' opinion was self-reported, thus it is possible that they may express different attitudes in other settings. In addition, we did not have data on specific minorities, such as sexual or ethnic minorities; therefore, we were unable to perform sensitivity analyses considering this information. Last, the dichotomization of our outcome could have led to loss of some information, and the measurement of attitudes through a written questionnaire instead of face-to-face interviews could represent a limitation.

Conclusion

In conclusion, the results of this study indicate that our students have a high consideration of the importance of gender medicine. Nevertheless, some students seem to be unsure whether this dimension of medicine has a practical utility. It also emerged that the strongest predictor of high consideration of gender medicine is having had positive experiences during traineeships in the wards. Hence, as gender medicine is not routinely taught at medical universities, it is essential to implement the teaching of this topic during elective courses and to create practical training occasions based upon the principles of gender medicine.

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Table 1 – Attitudes and personal experiences about Gender Medicine

		Overall sample (n=430) % (N)	Female students (n=294) % (N)	Male students (n=136) % (N)	p-value
High consideration of gender medicine	<i>No</i>	17.99 (77)	18.84 (55)	16.18 (22)	0.300
	<i>Yes</i>	82.01 (351)	81.16 (237)	83.82 (114)	
Most significant reason to emphasize the importance of gender medicine	<i>To improve the quality of healthcare services addressed to women</i>	1.40 (6)	2.04 (6)	0.00 (0)	0.385
	<i>To guarantee appropriate and personalized care</i>	89.72 (384)	89.12 (262)	91.04 (122)	
	<i>To improve planning and efficiency of healthcare services</i>	7.24 (31)	7.48 (22)	6.72 (9)	
	<i>I don't know</i>	1.64 (7)	1.36 (4)	2.24 (3)	
Perceived frequency of sex and gender consideration in the “Prevention” clinical phase in future career	<i>Not very often</i>	24.07 (103)	26.62 (78)	18.52 (25)	0.043
	<i>Yes, very often</i>	75.93 (325)	73.38 (215)	81.48 (110)	
Perceived frequency of sex and gender consideration in the “History data collection” clinical phase in future career	<i>Not very often</i>	25.93 (111)	28.33 (83)	20.74 (28)	0.060
	<i>Yes, very often</i>	74.07 (317)	71.67 (210)	79.26 (107)	
Perceived frequency of sex and gender consideration in the “Medical examination” clinical phase in future career	<i>Not very often</i>	41.59 (178)	46.08 (135)	31.85 (43)	0.004
	<i>Yes, very often</i>	58.41 (250)	53.92 (158)	68.15 (92)	
Perceived frequency of sex and gender consideration in the “Diagnostics” clinical phase in future career	<i>Not very often</i>	53.04 (227)	55.63 (163)	47.41 (64)	0.069
	<i>Yes, very often</i>	46.96 (201)	44.37 (130)	52.59 (71)	
Perceived frequency of sex and gender consideration in the “Treatment” clinical phase in future career	<i>Not very often</i>	37.47 (160)	40.96 (120)	29.85 (40)	0.018
	<i>Yes, very often</i>	62.53 (267)	59.04 (173)	70.15 (94)	
Thinking that biological differences between men	<i>Yes</i>	20.51 (88)	19.05 (56)	23.70 (32)	0.295
	<i>Yes, but only in prevention</i>	48.02 (206)	49.32 (145)	45.19 (61)	

and women are considered in clinical practice	<i>Yes, but only in diagnosis and treatment</i>	5.36 (23)	4.42 (13)	7.41 (10)	
	<i>No</i>	9.79 (42)	11.22 (33)	6.67 (9)	
	<i>I don't know</i>	16.32 (70)	15.99 (47)	17.04 (23)	
Perception that healthcare provided in hospital and territorial settings is closer to the needs of either men or women	<i>Closest to the needs of men</i>	13.79 (59)	15.02 (44)	11.11 (15)	0.202
	<i>Closest to the needs of women</i>	5.61 (24)	6.48 (19)	3.70 (5)	
	<i>Closest to the needs of both, without differences</i>	66.82 (286)	63.48 (186)	74.07 (100)	
	<i>I don't know</i>	13.79 (59)	15.02 (44)	11.11 (15)	
After having learnt more skills about gender medicine, thinking of using them in the future career	<i>Yes/Probably yes</i>	58.41 (250)	60.88 (179)	52.99 (71)	0.076
	<i>No/Probably no</i>	41.59 (178)	39.12 (115)	47.01 (63)	

Table 2 – Gender Medicine and Academic Training

		Overall sample (n=430) % (N)	Female students (n=294) % (N)	Male students (n=136) % (N)	p-value
Having ever dealt with gender medicine issues during lessons	<i>No</i>	34.88 (150)	37.76 (111)	28.68 (39)	0.101
	<i>Yes, frequently</i>	6.98 (30)	5.78 (17)	9.56 (13)	
	<i>Yes, sometimes</i>	58.14 (250)	56.46 (166)	61.76 (84)	
It happened during: pre-clinic courses*	<i>No</i>	68.86 (188)	72.07 (129)	62.77 (59)	0.076
	<i>Yes</i>	31.14 (85)	27.93 (50)	37.23 (35)	
It happened during: cardiology*	<i>No</i>	68.5 (187)	70.39 (126)	64.89 (61)	0.214
	<i>Yes</i>	31.5 (86)	29.61 (53)	35.11 (33)	
It happened during: endocrinology*	<i>No</i>	41.39 (113)	43.02 (77)	36 (38.30)	0.267
	<i>Yes</i>	58.61 (160)	56.98 (102)	61.70 (58)	
It happened during: neurology and psychiatry*	<i>No</i>	43.96 (120)	46.37 (83)	39.36 (37)	0.164
	<i>Yes</i>	56.04 (153)	53.63 (96)	60.64 (57)	
It happened during: immunology*	<i>No</i>	70.33 (192)	69.83 (125)	71.28 (67)	0.459
	<i>Yes</i>	29.67 (81)	30.17 (54)	28.72 (27)	
It happened during: gastroenterology*	<i>No</i>	87.91 (240)	89.94 (161)	84.04 (79)	0.111
	<i>Yes</i>	12.09 (33)	10.06 (18)	15.96 (15)	
It happened during: other courses*	<i>No</i>	73.26 (200)	70.95 (127)	77.66 (73)	0.148
	<i>Yes</i>	26.74 (73)	29.05 (52)	22.34 (21)	
Gender of the teacher who discussed about gender medicine issues during lessons*	<i>Woman</i>	17.39 (48)	19.44 (35)	13.54 (13)	0.170
	<i>Man</i>	32.97 (91)	35.00 (63)	29.17 (28)	
	<i>I don't remember</i>	49.64 (137)	45.56 (63)	57.29 (55)	
Having ever discussed with the tutor during traineeships in the wards about the impact of sex and gender on patient management	<i>No</i>	70.49 (301)	75.77 (222)	58.96 (79)	0.002
	<i>Yes</i>	2.58 (11)	2.05 (6)	3.73 (5)	
	<i>Yes, rarely</i>	26.93 (115)	22.18 (65)	37.31 (50)	
Having had the impression that the tutor took into consideration sex and gender of patients during clinical practice	<i>Yes</i>	38.35 (163)	36.52 (107)	42.42 (56)	0.037
	<i>Yes, but only female tutors</i>	2.35 (10)	2.73 (8)	1.52 (2)	
	<i>Yes, but only male tutors</i>	1.18 (5)	1.37 (4)	0.76 (1)	
	<i>No</i>	26.35 (112)	30.38 (89)	17.42 (23)	
	<i>I don't know</i>	31.76 (135)	29.01 (85)	37.88 (50)	

Preference for integrating the “training curriculum” of future doctors in the field of gender medicine through: a specific regular course	<i>No</i>	76.1 (321)	73.70 (213)	81.20 (108)	0.058
	<i>Yes</i>	23.9 (101)	26.30 (76)	18.80 (25)	
Preference for integrating the “training curriculum” of future doctors in the field of gender medicine through: inserting gender issues in existing disciplines	<i>No</i>	37.2 (157)	36.68 (106)	38.35 (51)	0.411
	<i>Yes</i>	62.8 (265)	63.32 (183)	61.65 (82)	
Preference for integrating the “training curriculum” of future doctors in the field of gender medicine through: sensitizing tutors about gender medicine teaching	<i>No</i>	67.8 (286)	65.74 (190)	72.18 (96)	0.114
	<i>Yes</i>	32.2 (136)	34.26 (99)	27.82 (37)	
Preference for integrating the “training curriculum” of future doctors in the field of gender medicine through: a supplementary course	<i>No</i>	67.5 (285)	69.20 (200)	63.91 (85)	0.167
	<i>Yes</i>	32.5 (137)	30.80 (89)	36.09 (48)	
Preference for integrating the “training curriculum” of future doctors in the field of gender medicine through: providing educational material to study at home	<i>No</i>	91.5 (386)	93.77 (271)	86.47 (115)	0.012
	<i>Yes</i>	8.5 (36)	6.23 (18)	13.53 (18)	
Preference for integrating the “training curriculum” of future doctors in the field of gender medicine through: periodic simulation of clinical cases with gender differences	<i>No</i>	51.9 (219)	51.90 (150)	51.88 (69)	0.540
	<i>Yes</i>	48.1 (203)	48.10 (139)	48.12 (64)	
Opinion on the importance of updating courses about gender medicine for doctors	<i>Not important</i>	3.06 (13)	2.40 (7)	4.51 (6)	0.003
	<i>Important</i>	17.88 (76)	14.04 (41)	26.32 (35)	
	<i>Very important</i>	79.06 (336)	83.56 (244)	69.17 (92)	
Having ever heard about gender medicine outside of university	<i>No</i>	38.92 (165)	41.24 (120)	33.83 (45)	0.089
	<i>Yes</i>	61.08 (259)	58.76 (171)	66.17 (88)	
Source of information about gender medicine: Internet	<i>No</i>	11.20 (29)	10.53 (18)	12.64 (11)	0.376
	<i>Yes</i>	88.80 (229)	89.47 (153)	87.36 (76)	
Source of information about gender medicine: Social Media	<i>No</i>	49.60 (128)	46.78 (80)	55.17 (48)	0.127
	<i>Yes</i>	50.40 (130)	53.22 (91)	44.83 (39)	
Source of information about gender medicine: Books	<i>No</i>	71.20 (183)	69.59 (119)	74.42 (64)	0.256
	<i>Yes</i>	28.80 (74)	30.41 (52)	25.58 (22)	
	<i>No</i>	86.40 (222)	84.8 (145)	89.53 (77)	0.198

Source of information about gender medicine: Brochures	<i>Yes</i>	13.60 (35)	15.20 (26)	10.47 (9)	
Source of information about gender medicine: Newspapers	<i>No</i>	75.10 (193)	76.61 (131)	72.09 (62)	0.261
	<i>Yes</i>	24.90 (64)	23.39 (40)	27.91 (24)	
Source of information about gender medicine: Other	<i>No</i>	88.30 (226)	91.23 (156)	82.35 (70)	0.033
	<i>Yes</i>	11.70 (30)	8.77 (15)	17.65 (15)	

*participants only answered if they had ever dealt with gender medicine issues during lessons

**participants only answered if they had ever been informed about gender medicine outside of university

Table 3 – Potential predictors of high consideration of gender medicine in patient management

		adjOR	95%CI	p-value
Age	<i>(Scalar variable) (n=415)</i>	1.39	1.07-1.80	0.013
Sex	<i>Female (n=287)</i>	1		0.365
	<i>Male (n=128)</i>	1.32	0.72-2.41	
Year of Course	<i>Fifth (n=178)</i>	1		0.285
	<i>Sixth (n=131)</i>	1.44	0.74-2.81	0.949
	<i>Outside prescribed time (n=106)</i>	0.97	0.42-2.27	
Marital Status	<i>Single (n=368)</i>	1		0.477
	<i>With partner (n=47)</i>	0.72	0.29-1.78	
Health Status self-reported	<i>Good/very good (n=359)</i>	1		0.933
	<i>Poor (n=56)</i>	0.97	0.45-2.09	
Chronic Diseases	<i>No (n=358)</i>	1		0.984
	<i>Yes (n=57)</i>	0.99	0.44-2.25	
Familiarity for chronic diseases	<i>No (n=112)</i>	1		0.612
	<i>Yes (n=303)</i>	1.16	0.65-2.07	
Knowledge about Gender Medicine	<i>Poor (below the mean of the sample) (n=204)</i>	1		0.170
	<i>Good (equal or above the mean of the sample) (n=211)</i>	1.46	0.85-2.50	
Having ever dealt with gender medicine issues during lessons	<i>No (n=145)</i>	1		0.906
	<i>Yes (frequently/sometimes) (n=270)</i>	1.03	0.59-1.80	
Having ever discussed with the tutor during traineeships in the wards about the impact of sex and gender on patient management	<i>No (n=295)</i>	1		0.657
	<i>Yes (n=120)</i>	1.17	0.58-2.36	
Having had the impression that the tutor took into consideration sex and	<i>No/I don't know (n=239)</i>	1	1.99-7.56	<0.001
	<i>Yes* (n=176)</i>	3.88		

gender of patients during clinical practice				
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The model included 415 total observations.

*Yes included the options: Yes; Yes, but only female tutors; Yes, but only male tutors