

UDC 613.88:614.253.4:378.147

<https://doi.org/10.26641/2307-0404.2023.4.294193>

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SEXUAL HEALTH PREPAREDNESS AMONG MEDICAL STUDENTS

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Цитування: Медичні перспективи. 2023. Т. 28, № 4. С. 129-140

Cited: Medicni perspektivi. 2023;28(4):129-140

Key words: sexual health, medical education, medical students, sexual education

Ключові слова: сексуальне здоров'я, медична освіта, студенти-медики, сексуальна освіта

Abstract. Sexual health preparedness among medical students. Merhavy Z.I., Varkey T.C., Kotyk T., Zeitler C.

It has been found that many medical students and early career physicians express feelings of being unprepared and undereducated on topics relating to patient sexual health. Based on previous reports on the topic, the quality and quantity of sexual health education in medical school has been minimally improved over the last several years. Aim of the work is to identify possible deficiencies in sexual health preparation within current medical education curriculum among United States allopathic, osteopathic, and Caribbean medical programs. Medical students (n=100) from three different medical program types, including United States allopathic (n=31), United States osteopathic (n=23), and Caribbean allopathic program (n=46), and years of study (1-4), were recruited informally and participated in a 15-question survey regarding their perceptions and experience of sexual health education, training, and preparation at their respective medical school. After obtaining informed consent, students completed this survey through a private form and the data was compared to students of different years, different programs, and different intended specialties. With a sample size of 100 students from three different medical school programs, it was clear that most schools provide some level of sexual health education to students, however, in most cases, the education received was overall perceived as less than adequate by the students. Additionally, it was seen that almost every student indicated a need for their respective institution to provide additional training in both basic sciences as well as in their clinical education to feel more confident in their ability to discuss sexual health priorities with their patients. Current practices in medical education continue to fail to meet student expectations. To create more competent and confident physicians to adequately assist patients in their sexual health needs, more positive curriculum changes need to be made in order to establish a new, higher standard for quality of sexual health care. Small changes at the pre-clinical and clinical level can improve overall student preparedness and confidence when discussing sexual health with patients.

Реферат. Підготовленість студентів-медиків з питань сексуального здоров'я. Мергаві З.І., Варкі Т.С., Котик Т., Зейтлер С. Було встановлено, що багато студентів-медиків і лікарів, які починають свою кар'єру, відчувають себе невідготовленими та недостатньо освіченими щодо питань сексуального здоров'я пацієнта. Виходячи з попередніх доповідей з цієї теми, за останні кілька років якість і рівень освіти з питань сексуального здоров'я в

медичній школі децю покращилися. Мета роботи – визначити недоліки в підготовці з питань сексуального здоров'я в поточній програмі медичної освіти в алопатичних, остеопатичних медичних програмах у США та країнах Карибського басейну. Студенти-медики ($n=100$), які навчалися за трьома різними типами медичних програм, включаючи алопатичну програму Сполучених Штатів Америки ($n=31$), остеопатичну програму США ($n=23$) та алопатичну програму країн Карибського басейну ($n=46$), у різні роки навчання (1-4), були неофіційно залучені та взяли участь в опитуванні, що складалось з 15 запитань, щодо їх сприйняття та досвіду з питань освіти, навчання, підготовки стосовно сексуального здоров'я у відповідній медичній школі. Після підписання інформованої згоди студенти заповнили цей опитувальник анонімно, за допомогою запропонованої форми, й отримані дані були порівняні між студентами, які навчалися в різні роки, за різними програмами і різними спеціальностями. Аналіз результатів опитування 100 студентів з трьох різних медичних шкіл показав, що більшість медичних шкіл надають певний рівень освіти з питань сексуального здоров'я, проте у всіх випадках студенти сприймали отриману освіту як недостатню. Крім того, було зазначено, що майже кожен студент вказав на потребу в тому, щоб їхній відповідний навчальний заклад забезпечив додаткову підготовку як з фундаментальних наук, так і з клінічної освіти, щоб відчувати себе більш впевненими у своїй здатності обговорювати питання сексуального здоров'я зі своїми пацієнтами. Поточна практика в медичній освіті продовжує не відповідати очікуванню студентів. Щоб підготувати більш компетентних і впевнених лікарів, які могли б належним чином допомогти пацієнтам у їхніх потребах з питань сексуального здоров'я, необхідно внести певні зміни до навчального плану, щоб встановити новий, вищий стандарт якості медичної допомоги з питань сексуального здоров'я. Невеликі зміни на доклінічному та клінічному рівнях підготовки можуть покращити загальну підготовленість студентів та впевненість під час обговорення питань сексуального здоров'я з пацієнтами.

When discussing overall health and wellness, sexual health is an integral factor that can be the source of many physical and/or mental health concerns [1]. Many patients have stated that sexual health is an important component of their overall health and expect their physician to be willing and able to talk about these concerns with them [1]. Though this may be the expectation of patients, in many medical schools, this may not be a training or educational priority [2]. Over the last decade, studies have indicated that medical curriculum designed to educate medical students about sexual health have continuously decreased [2]. This lack of education of sexual health may be consistent across different curricula all over the world [1, 2, 3]. Based on numerous surveys and questionnaires over the last two decades, it has become clear that there is not much changing with sexual health education in medical schools, implying that medical students are graduating and seeing patients with a lack of accurate knowledge about important health issues [3].

Many schools have implemented additional sexual health education and training into their curriculum, though it is unclear if these additions have made a substantial impact amongst the students' comprehension of the topic [4]. There have been numerous accounts of medical schools integrating sexual health into their curriculum and yet still seeing students fail to feel prepared [2, 4]. Studies have been conducted with pre-health undergraduates and medical students where, regardless of if their schools have sexual health as part of their curriculum, students feel under-prepared or unsatisfied with this component of their education and training [1, 3, 5, 6]. If medical students do not receive adequate training or education on how

to deal with sexual health concerns of their patients, many potential future issues may arise, such as poor physician screening of sexually transmitted infections (STIs) or adequate counseling for those patients who need to understand safe and healthy sex practices [7, 8]. It is imperative that physicians need to be able to properly and confidently take a sexual health history and explore patients' sexual health concerns to properly diagnose, manage, and counsel patients [2, 5]. Reports from studies have widely shown that physicians are uncomfortable when approaching the subject of sex around their patients and prefer not to ask questions about their patients' sexual practices [3, 5, 9, 10].

This study aims to identify and compare the capacity by which medical schools educate and train students about sexual health. In understanding that sexual health often makes up a miniscule portion of a medical school's curriculum, if at all, it is imperative to bring these shortcomings to light to moderate future curriculum change. The study assessed current medical students' perception of their school's sexual health education and training by indicating if/how sexual health education is offered, to what extent, and how prepared they feel in entering residency.

MATERIALS AND METHODS OF RESEARCH Study Design and Population

One hundred (100) students participated in the study from 3 different types of programs: United States allopathic medical program (MD), United States osteopathic medical program (DO), and Caribbean MD program (IMG MD), all ranging from first year through fourth year. The current study was completed to not only assess medical students' preparedness, but to compare level of training and education between the program types. Although the study has limitations

in sample size, this study is merely meant to provide some insight as to the priorities some of these program's place on sexual health education as a preliminary study. Additionally, by spanning all years of medical school education, it can also be seen if the level of sexual health education increases as the student progresses through their training. Participant age and gender were not collected.

Data Collection Tools

The data were collected by questionnaire, designed based on previous similar studies to assess medical students' preparedness regarding sexual health issues [1, 6, 11, 12].

A portion of the questionnaire included general inquiries about the year of education, type of program, anticipated medical specialty, and consent in participation.

The remainder of the questionnaire consisted of 3 subsections. The first section included 4 questions regarding education and prior exposure (2 Likert-type questions, 1 multiple choice question related to their previous/current medical school sexual health education experience, and 1 multiple choice question regarding learning about sexuality/sexual health in various settings prior to starting medical school). The second and third sections inquired on perception and desire for change, consisting of six and two questions, respectively, by rating on a scale of 1-10. The scores assessing the desire for change were reversed to ensure consistency and comparability across questions in the other sections. The reliability analysis of the survey instrument yielded a Cronbach's alpha coefficient of 0.82, indicating good internal consistency and reliability for the combined responses of participants on questions related to scoring questions.

Survey Distribution and Data Collection

The questionnaire was distributed via Google Form to the student population at all three institutions, as was advertised to students in all levels of training. After the first 100 responses were recorded across all three institutions, the Google Form was closed, and the responses were analyzed.

Statistical Analysis

The data underwent thorough analysis using R software (v. 4, license: GPL-3, <https://www.R-project.org/>). The normality assumption was evaluated using the Shapiro test. Descriptive statistics were presented as absolute numbers (n) and frequencies (%) for categorical data, as was the median with interquartile range (Me[IQR]) for continuous data. Analytical methods included the Chi-square test, Spearman correlation, and Kruskal-Wallis tests with post-hoc analysis. Principal component analysis, factor analysis, and General Additive Model (GAM) analysis were carried out to unveil underlying associations. The level of $p < 0.05$ was considered significant.

Ethics Statement

Students were voluntarily recruited utilizing informal channels. No incentives were offered to the students involved. The form was designed not to collect any data about the students outside of the program of study (US MD, Caribbean MD, or US DO program) and their current level of training (years 1-4 of medical school). To keep the privacy of the students who completed the survey, responses were recorded without containing any personal student information. Thus, keeping the survey anonymous allowed the participants to complete the survey honestly without fear of their responses being known or shared. The students were informed in writing before beginning the survey that their responses were not required and that they could stop at any time.

Informed Consent

Prior to survey participation via Google Form, an informed consent statement was presented and required for all respondents; the informed consent was obtained from all participants who agreed to have their responses recorded and used for the purpose of this study.

The research was conducted in accordance with the principles of bioethics set out in the WMA Declaration of Helsinki – “Ethical principles for medical research involving human subjects” and “Universal Declaration on Bioethics and Human Rights” (UNESCO).

RESULTS AND DISCUSSION

As indicated by the participants, 31 % of students attend a U.S. MD program 46% attend a Caribbean MD program (IMG MD), and 23% attend a U.S. DO program (DO). At the time of completion of the survey, 30% of students were in their first (1st) year, 50% were in their second (2nd) year, 10% were in their third (3rd) year, and 10% were in their fourth (4th) year.

Intended Specialty

The last question sought to gain insight into perceptions of students of each intended specialty. Responses were grouped according to Library of Congress Classification Outline (Class R). Groups with ≤ 3 responses were assigned in the group “Miscellaneous”. Of the students who participated in the survey, 4% were undecided, 14% – Emergency Medicine, 33% – Internal Medicine, 4% – Obstetrics and Gynecology (OBGYN), 7% – Pediatrics, 32% – Surgery, and 6% Miscellaneous.

Education and Prior Exposure

Participants were asked to select all that applied regarding their previous/current medical school sexual health education experience. Regarding previous/current medical school sexual health education experience, 42% of the participants received formal instruction during basic sciences, whereas only 6% received such training during clinical rotations. Optional and required supplemental coursework have

been attended by 10% and 27%, respectively. Meanwhile, 28% had access to workshops/seminars. However, 34% of participants reported not receiving sexual health education or were unaware of any offerings at their school (Fig. 1).

Regarding students' perception of sexual health education at their school, only 5% of students felt that their education on the topic was excellent. 27% of students thought their sexual health education was adequate and 32% felt it was neither adequate nor inadequate. 19% of students felt that they were given

an inadequate sexual health education whereas 17% felt that it was either poor or non-existent (Table 1). When asked about students' perceptions on education and training about how to take a sexual health history at their school, 11% felt that it was excellent, 33% felt it was adequate, 24% felt it was neither adequate nor inadequate, 17% felt it was inadequate, and 15% felt it was poor or non-existent as seen in (Table 1). However, there were no significant differences in participants responses in terms of education program type.

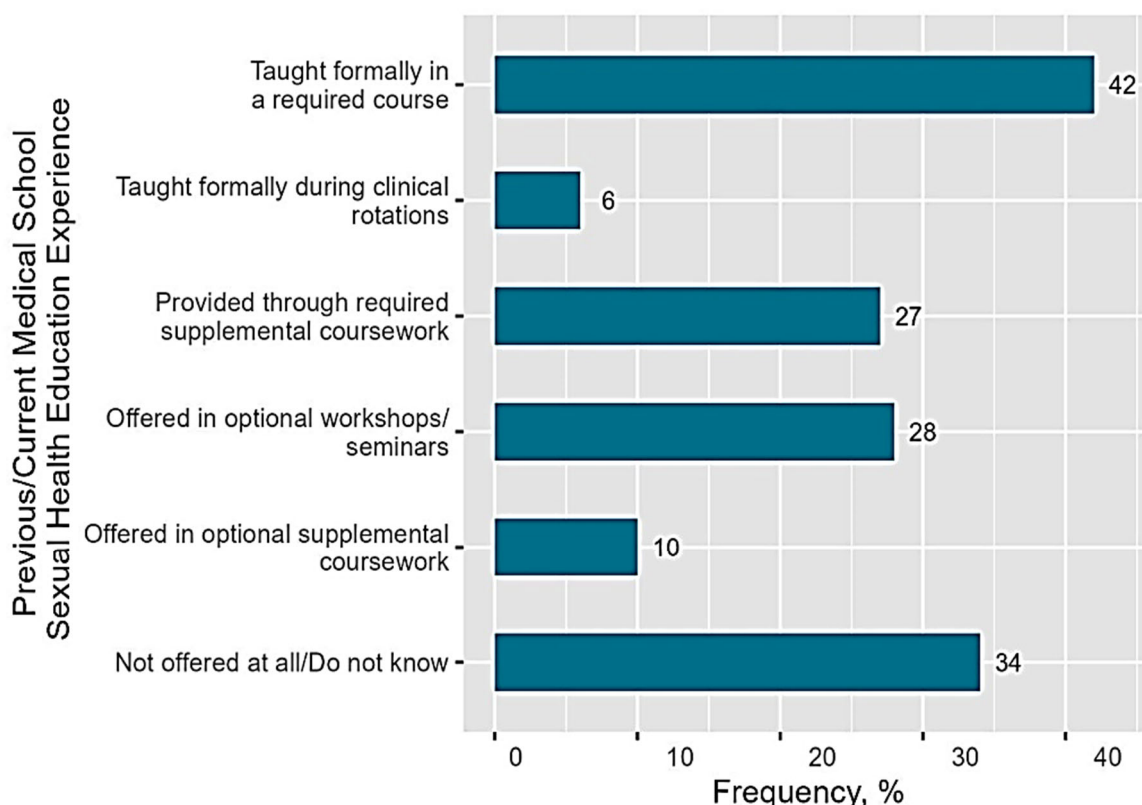


Fig. 1. Students' previous/current educational exposure

The survey also asked students to select all regarding if/how they learned about sexuality/sexual health in various settings prior to starting medical school. The survey revealed that students had varying levels of prior exposure to sexuality/sexual health education across different settings prior to starting medical school, with the highest exposure during high school and from personal experiences. (Fig. 2).

Multiple answers were allowed for questions regarding previous/current medical school sexual health education experience (EE) and learning about sexuality/sexual health in various settings prior to starting medical school (PL). As a result, each res-

ponse was characterized by combinations of options. To reduce the dimensionality and influence of options within the assessed population, a principal component analysis was performed. Figure 3 illustrates the structure of principal components, which are characterized by one component for EE and three components for PL (PL1 "Informal Learning", PL2 "School-Based Learning", PL3 "Additional Learning Contexts"). It is important to highlight that the observed differences between EE and PL2 within the DO and IMG MD programs are the sole significant distinctions (p=0.05).

Table 1

Participants' responses, grouped by program type

			DO (n=23)	MD (n=31)	IMG MD (n=46)	p	Total
Education and prior exposure							
Q1	"I feel sexual health education in my school has been:", n	Poor/Non-existent	0	5	12	0.065	17
		Inadequate	3	7	9		19
		Neither adequate nor inadequate	9	9	14		32
		Adequate	11	7	9		27
		Excellent	0	3	2		5
Q2	"I feel instruction on how to take a sexual health history at my school has been:", n	Poor/Non-existent	0	5	10	0.081	15
		Inadequate	5	6	6		17
		Neither adequate nor inadequate	5	4	15		24
		Adequate	11	10	12		33
		Excellent	2	5	3		10
Perception							
Q3	"I feel I have a good understanding of what sexual health encompasses", Me [IQR]		8 [7-8]	8 [7-9]	8 [6.25-9]	0.924	8 [7-9]
Q4	"I feel that having a good understanding of sexual health is important in my role as a future physician", Me [IQR]		9 [7-10]	10 [9.5-10]	10 [8-10]	0.068	10 [8-10]
Q5	"I feel comfortable speaking with future patients about their sexual health", Me [IQR]		7 [6-8.5]	8 [7-10]	8 [7-8.75]	0.20	8 [7-9]
Q6	"I feel comfortable speaking with my colleagues about sexual health", Me [IQR]		7 [6-9]	10 [8-10]	8 [7-9]	0.015 IMGMD<MD DO<MD	8 [7-10]
Q7	"I feel prepared to speak with future patients about their sexual health", Me [IQR]		7 [5.5-9]	8 [7-10]	7 [6-9]	0.094	8 [6-9.25]
Q8	"I feel prepared/confident to take a sexual health history", Me [IQR]		7 [6-9]	9 [7-10]	8 [6-9]	0.140	8 [6-9]
Desire for change							
Q9	"I feel my medical school could do more to educate me on sexual health", Me [IQR]*		3 [2-5]	3 [1-6]	1 [1-3]	0.124	3 [1-5]
Q10	"I feel my clinical education could do more to educate me on sexual health", Me [IQR]*		4 [2-6]	3 [1-5.5]	2.5 [1-4]	0.173	3 [1-5]

Notes. * – scores were reversed.

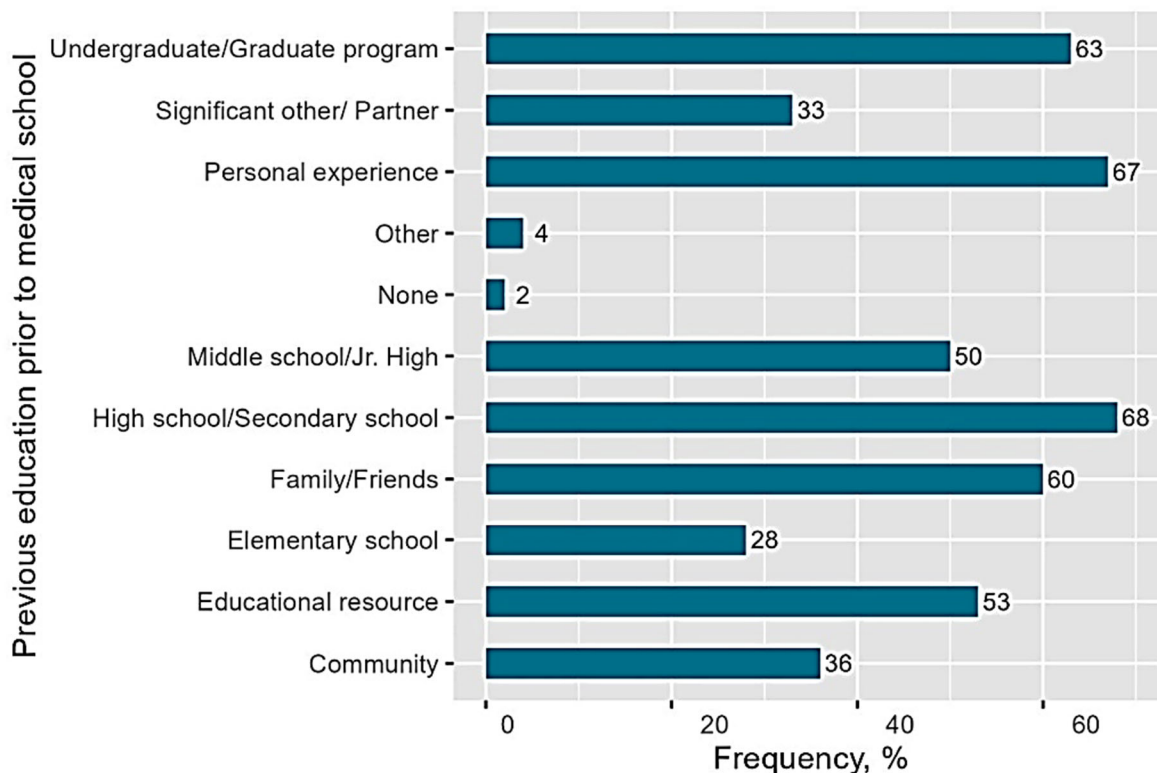


Fig. 2. Previous education prior to medical school

Perception

This section of the survey demonstrates relatively positive participant perception of sexual health in terms of its comprehensiveness, importance, preparedness, and comfort level when speaking with future

patients. Surprisingly, significantly lower values were found in terms of feeling comfortable speaking with colleagues about sexual health among IMG MD and DO students compared to MD students.

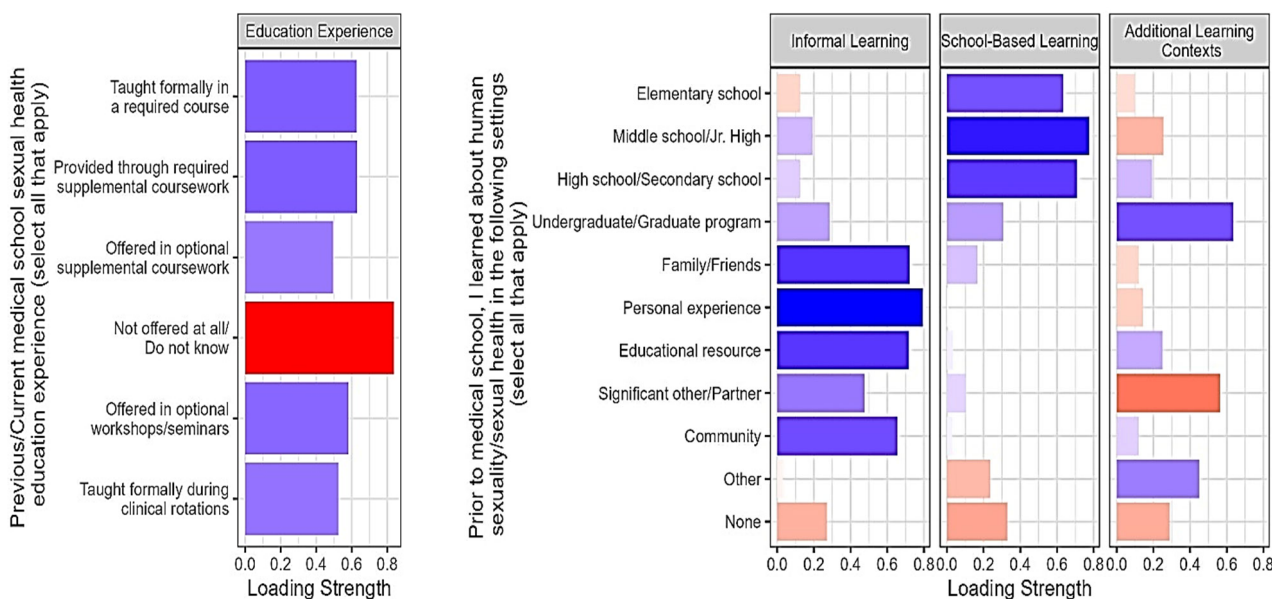


Fig. 3. Principal component analysis of previous/current medical school sexual health education experience (left) and learning about sexuality/sexual health in various settings prior to starting medical school (right)

Table 2

**Scores in previous/current medical school sexual health education experience (EE)
and learning about sexuality/sexual health in various settings prior
to starting medical school (PL) (Me[IQR])**

	DO (n=23)	MD (n=31)	IMG MD (n=46)	p	Total
EE	0.63 [0.63_1.21]	0.63 [-0.84_1.10]	-0.13 [-0.84_0.63]	0.029 IMGMD<DO	0.63 [-0.84_1.13]
PL1 (Informal Learning)	1.51 [0.76_2.89]	2.17 [1.48_2.23]	1.44 [0.67_2.23]	0.107	1.52 [0.72_2.23]
PL2 (School-Based Learning)	1.48 [0.71_2.12]	0.71 [0.32_1.48]	0.71 [0.16_1.48]	0.045 IMGMD-DO=0.05	0.78 [0.64_1.48]
PL3 (Additional Learning Contexts)	0.07 [0_0.64]	0.07 [0_0.64]	0.07 [0_0.64]	0.595	0.07 [0.00_0.64]

Desire for change

The last two questions show that IMG MD students demonstrate higher desire of change in their sexual education, however it is not statistically significant.

Survey Construct Validity

Correlation analysis revealed a set of significant relationships between question responses that are characterized by different strength of relations

(Table 3). The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO-MSA) was found to be 0.785 (>0.6), indicating the suitability of the data for factor analysis [13]. Thus, two factors were extracted (Fig. 4): F1 is characterized by relations with Q3-8 ("Comfort and Preparedness"), explaining 30% of the variance, while F2 is characterized by Q1-2, 9-10 ("Education and Awareness"), explaining 22% of the variance. Factors are moderately correlated (0.35).

Table 3

Survey within question correlation matrix

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1	-									
Q2	0.69*	-								
Q3	0.27*	0.33*	-							
Q4	0.11	0.15	0.27*	-						
Q5	0.15	0.28*	0.24*	0.30*	-					
Q6	0.15	0.30*	0.27*	0.29*	0.61*	-				
Q7	0.26*	0.39*	0.38*	0.41*	0.71	0.52*	-			
Q8	0.25*	0.36*	0.47*	0.35*	0.63*	0.44*	0.79*	-		
Q9	0.52*	0.55*	0.13	0.07	0.24	0.16	0.29*	0.27*	-	
Q10	0.38*	0.38	0.10	0.02	0.08	0.01	-0.09	0.19	0.70*	-

Notes: * – statistically significant difference (p<0.05); Q9 and Q10 – Scores were reversed.

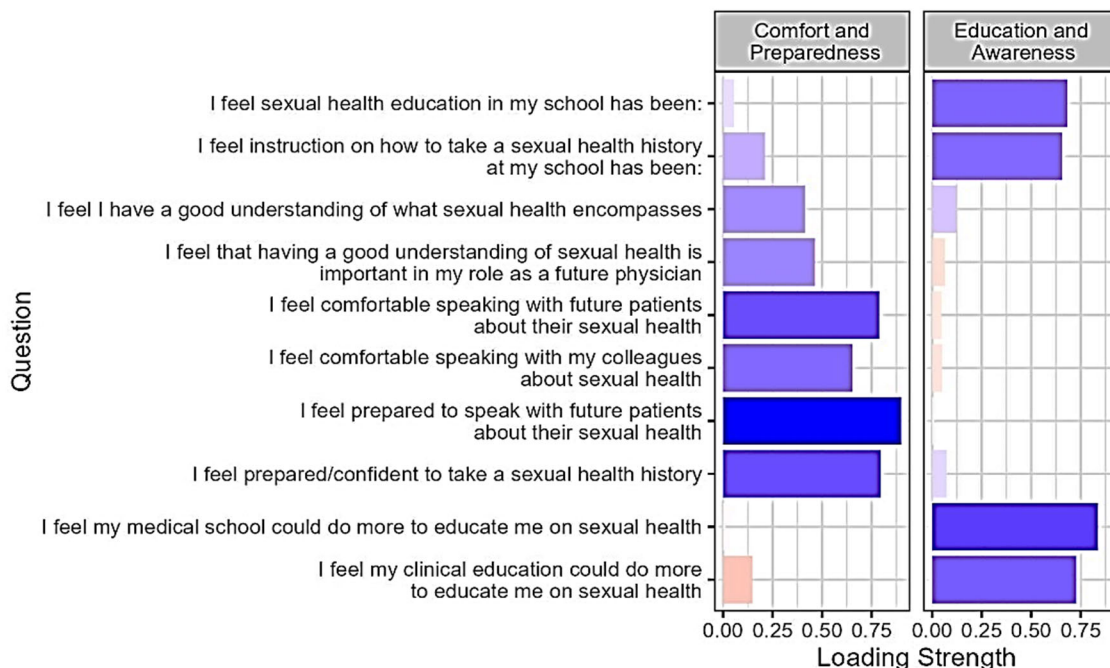


Fig. 4. Structure of factors

It should be noted that the statistical difference was determined for F1 “Comfort and Preparedness”, however, post-hoc analysis does not reveal a difference between values in terms of education program. Meanwhile, scores in F2 “Education and Awareness” tend to be significantly different (Table 4). These conditions can be explained by the limited sample size. However, MD students feel

greater levels of comfort and preparedness, while DO students show lower preparedness but the highest score in education and awareness. It can be explained that the majority of such students evaluate their education as adequate (Q1-2) and believe that medical school and clinical education could do more in the field of sexual health education.

Table 4

Summary of scores depends on type of education program (Me[IQR])

	DO (n=23)	MD (n=31)	IMG MD (n=46)	p	Total
F1 (Comfort and Preparedness)	28.78 [25.75-34.37]	35.54 [30.19-36.93]	30.63 [27.54-34.77]	0.049	31.80 [27.65 - 36.44]
F2 (Education and Awareness)	10.71 [7.13-12.15]	9.88 [5.26-13.31]	7.09 [4.93-9.39]	0.057	8.24 [5.58 - 12.52]

Both identified factors are influenced by numerous variables and their interactions. Linear regression analysis did not yield significant linear relationships, leading to the application of general additive models. The F2 factor “Education and Awareness” is influenced by education program type, year of study, EE, and chosen specialty. Similarly, the EE factor depends on program type and year of study, prompting the inclusion of their interactions. It has been found that significant relations (Fig. 5) between

F2 and 4th year, influence of EE, obtained on 2nd and 4th years of study. Three desired specializations were found to have a positive relationship with the F2 factor of Education and Awareness, with the strongest positive relationship being with those desiring to pursue internal medicine (Emergency Medicine =2.47, Internal Medicine =3.06, Surgery =2.36, p<0.05).

“Comfort and Preparedness” is developed on education (F2 “Education and Awareness” within program type), specialty, relations of medical school sexual

health EE and Additional Learning Contexts (PL3), school-based learning (PL2) and informal learning (PL3). It has been found significance influence of F2 “Education and Awareness” specific to program type, associations of EE and PL3. Also, the intended Pediat-

rics subspecialization (-9.50) and the Doctor of Osteopathic Medicine (DO) program type (-5.66; $p < 0.01$) (Fig. 6) stood out with a negative relationship in regards to the relations with “Comfort and Preparedness”.

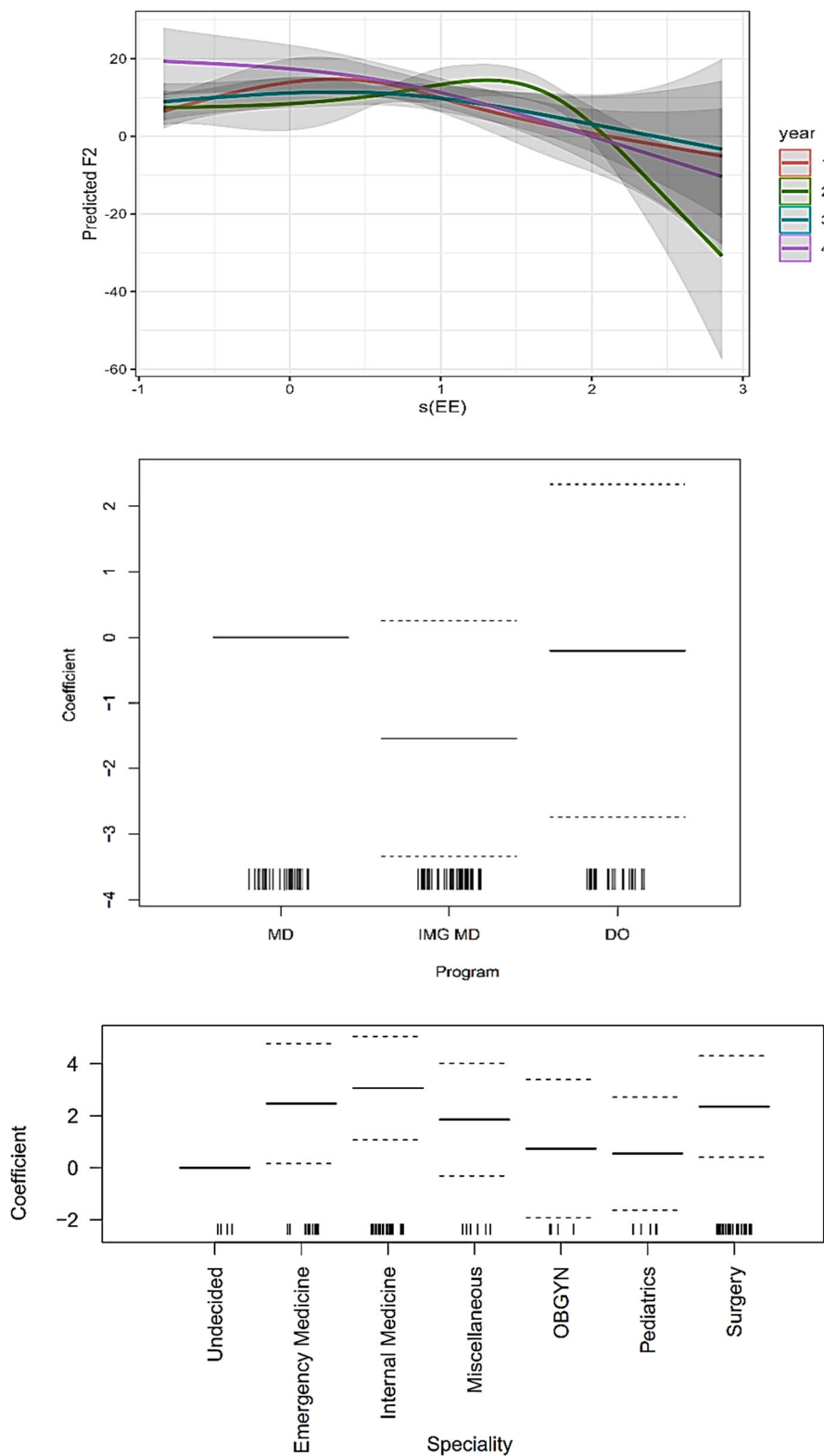


Fig. 5. Analysis of “Education and Awareness” relations

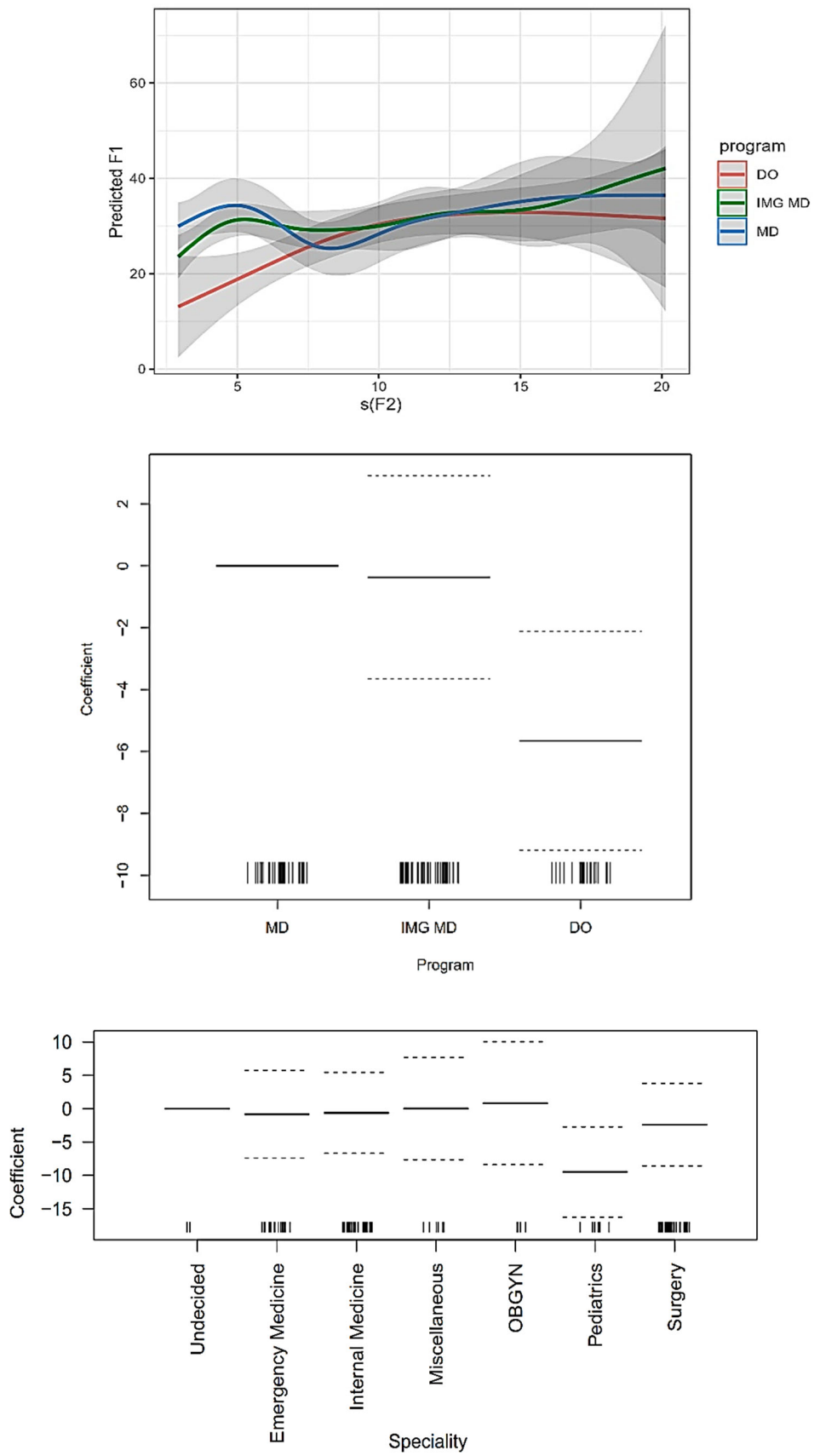


Fig. 6. Analysis of “Comfort and Preparedness”

These results support the hypothesis that medical schools are likely inadequately teaching students about sexual health. As seen in many other instances of similar surveys, poor response rates can be noted as many students may not have been motivated to answer the survey as they may not have enough confidence or knowledge of the topic to feel comfortable responding [3, 5, 14].

In both questions inquiring how students felt regarding their school's sexual health education and history-taking, over half of respondents indicated that they felt it was less than adequate. When pairing these responses to the two questions asking about if students felt their schools could do more to educate them on these topics, the responses were among our highest rated next to that of importance of understanding as a physician. In the comments section of the survey, some students commented on the inadequacies their school faces regarding this subject. Although this respondent indicated that sexual health was taught in a formal course as part of their program, they stated, "we need more than 2 hours on sexual health in a clinical medicine course" and indicating that the education they received was not adequate. A student of another program commented on how even though sexual health is taught formally in a required course, the professors were "awkward" and implied that the instructor did not provide a comfortable environment to talk about the topic.

This survey and paper seek to address the growing concern of physicians being unprepared to have conversations surrounding sexual health adequately and comfortably with their patients [15]. As can be seen in the responses to the survey, students most indicated that their schools provided some level of sexual health education and/or training, however, students still do not yet feel as though the education they are receiving is adequate to be confident to discuss these topics with their patients or to take a sexual health history.

When attempting to address the inadequacies of the sexual health education at these institutions, countless previously published works have noted the vast positive difference small, smart changes to the curriculum can make in increasing the knowledge, attitudes, and skills of medical students regarding sexual health [2, 11, 16-21].

Limitations

The interpretation of the student survey data presented is limited in several ways, as the data collection was provided to students of varying years of training, and thus limiting the responses to which point in their medical education they may be exposed to the topic. Additionally, there was a far lower response rate than the authors would have liked to see, specifically among the third- and fourth-year

medical students as well as students in the DO programs. Finally, it is difficult to know if certain students are actively seeking out these educational opportunities at their schools/clerkship rotations versus which students are actively avoiding being educated on the topic, thus potentially providing subconscious bias when filling out the survey.

CONCLUSIONS

1. Medical students are consistently being seen to have a lower-than-expected understanding of sexual health, inadequate counseling skills, and low level of comfortability speaking with their patient about their sexual health.

2. Comparisons of determined factors "Comfort and Preparedness", "Education and Awareness" did not reveal significant differences in terms of education program.

3. "Education and Awareness" is significantly positively influenced by year of study, anticipated specialties (Surgery, Internal and Emergency Medicine) and sexual health education experience (that is significant between U.S. DO and Caribbean MD programs). The 2nd and 4th years of study have been found to be the most essential in this context.

4. "Comfort and Preparedness" significantly depends on program type and specialty, relations of medical school sexual health education experience and additional learning contexts, level of "Education and Awareness" associated with program type.

Acknowledgments

The authors of this paper would like to extend their gratitude towards the American Medical Student Association (AMSA) for providing a Sexual Health Scholars Program which gave the authors exposure to the topic of the paper as well as providing an opportunity to learn through research.

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Funding. This research received no external funding.

Conflict of interests. The authors declare no conflict of interest.

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Стаття надійшла до редакції
01.10.2023

