



Knowledge and Attitudes of Sana'a University Medical Students towards Premarital Screening

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ABSTRACT

Objectives: To assess the knowledge and attitudes of Sana'a University medical students towards premarital screening (PMS).

Methods: A cross-sectional study was conducted among the students of the Faculty of Medicine and Health Sciences, Sana'a University, during the academic year 2012/2013. A self-administered questionnaire was distributed to 516 Yemeni students. The questionnaire was composed of three parts; the first part was about socio-demographic data, the second part was about the students' knowledge about PMS and the third part was about their attitudes towards the PMS.

Results: Most of the respondents (92%) knew that PMS reduces hereditary and sexually-transmitted diseases, believed that it is important to carry out and agreed to do it. Making PMS mandatory and legal prevention of marriage in case of positive results were accepted by 82% and 62% of the respondents, respectively.

Conclusions: Although the majority of Sana'a University medical students favored PMS and had a fair knowledge about most of its aspects, a small proportion of them refused its mandating or legally preventing at-risk marriages. These negative attitudes could be reversed by health education of medical students on PMS.

Keywords: Premarital screening, Knowledge, Attitude, Medical student, Sana'a, Yemen

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1. Introduction

Genetic disorders and sexually transmitted diseases are common and responsible for considerable morbidity and mortality in the Arab world (1, 2). Consanguineous marriage is one of the most contributing factors to the high prevalence of inherited blood disorders, with a rate ranging from 25 to 60% (1). Premarital screening (PMS) for genetically and sexually-transmitted diseases is an important method to minimize their occurrences among high-risk populations and to reduce their social, emotional and financial burden on the family and society. Applying PMS was successful in many parts of the world (3, 4).

Yemen is a poor country with a population of about 24 million (5), where hereditary hemoglobinopathies and sexually-transmitted hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are common and represent a significant health problem. It has been shown that sickle cell trait is prevalent among 2.2% of the population, with a higher frequency (8.7%) in certain areas of the country (6). In addition, the prevalence of thalassemia was reported to be 13.0 % (8.6% for α -thalassemia and 4.4% for β -thalassemia traits) in Sana'a city (7). On the other hand, hepatitis B surface antigen and antibodies to HCV were reported to be prevalent among 8.0 and 1.7% among healthy Yemeni volunteers and 10.8 and 2.7% among blood donors, respectively (8). Human immunodeficiency virus (HIV) infections are gradually increasing among the Yemeni population, with an estimated prevalence rate of 0.1% (9).

PMS has yet to be established in the country where the consanguineous marriage rate is high (40%), $\geq 85\%$ of which are between first cousins) and traditional marriages (10), which may make its acceptance difficult. The

knowledge and attitudes towards PMS among medical students influence its practice and success rate because they will be the healthcare providers who will provide such services to the general population via primary healthcare centers. Meanwhile, they can play a key role in propagating and educating their communities about the importance of PMS. Exploring the knowledge and attitudes of medical students towards PMS is an essential step to evaluate their impact on planning to implement PMS. Studies in some Arab countries, like Egypt and Syria, have revealed a significant lack of knowledge about PMS (11–14). There is a lack of data about this important, complex and controversial subject in Yemen except for one study carried out among 200 medical and 200 non-medical university students in Hadhramout, east of Yemen, where the level of knowledge and positive attitudes among medical students were 71.0% and 68.5%, respectively (13). Because this study may not accurately reflect the situation among the medical students in the capital city of Sana'a, the present study aimed to assess the knowledge and attitudes of Sana'a University medical students towards PMS.

2. Methods

This cross-sectional study was conducted among the students of the Faculty of Medicine and Health Sciences, Sana'a University, Sana'a, Yemen- during the second semester of the academic year 2012/2013. Participants were selected by simple random sampling from the Yemeni students who attended the faculty during the study period. Out of a total of 2,770 students (1,546 females and 1,224 males), 516 students (315 females and 201 males) were recruited from its different medical specialties.

A structured, self-administered questionnaire composed of three parts was designed by



the authors based on the available literature on knowledge and attitudes towards PMS (15–17). The first part was about the socio-demographic data including sex, age, marital status, specialty, academic level, consanguinity between parents and personal/family history of hereditary diseases. The second part was about the students' knowledge about PMS, its aim, availability in Yemen, included tests, individuals to be tested, diseases to be screened for and source of students' information on PMS. The third part was about the students' attitudes towards PMS and their expected response to it in case of positivity for genetic or sexually-transmitted diseases.

The questionnaire answering was supervised by the researchers after giving a brief explanation about the main aim of the study. The students were assured of the confidentiality of their information and its use for the research purpose only. The study protocol was approved by the Medical Research Ethics Committee of the Faculty of Medicine and Health Sciences, Sana'a University. In addition, written consent was obtained from the respondents who agreed to participate in the study.

Data obtained was entered into Microsoft Excel file and then analyzed by Epi Info version 6. Differences between categorical variables were tested using chi-square test or fisher exact test. A p-value of < 0.05 was considered statistically significant.

3. Results

3.1. Socio-demographic characteristics of respondent students

Table (1) shows that out of 516 students enrolled in the study, 315 (61.0%) were females and 201 (39.0%) were males. Their mean age was 21.6 years (range: 19–28). All respondents were Yemenis, the majority were single ($n=475$;

92.0%) and ($n=401$; 78.0%) enrolled in the first to third academic levels. The rate of consanguineous marriages between their parents was 37.0% ($n=19$), being 12 and 25% for first- and second-cousin marriages, respectively. Personal and family histories of hereditary diseases were reported by 1.0% ($n=4$) and 14.0% ($n=71$) of respondents, respectively.

Table 1. Socio-demographic characteristics of respondent Sana'a University medical students- 2012/2013 ($n=516$)

Characteristic	n (%)
Gender	
Female	315 (61)
Male	201 (39)
Age (years)	
≤ 20	175 (40)
> 20	341 (60)
Marital status	
Single	475 (92)
Married	41 (8)
Specialty	
Medicine	177 (34)
Laboratory	239 (46)
Nursing	100 (20)
Academic level	
1–3	401 (78)
4–7	115 (22)
Consanguinity between parents	
Yes	190 (37)
No	326 (63)
Type of relation between parents	
First cousins	60 (12)
Second cousins	130 (25)
Personal history of hereditary disease(s)	
Positive	4 (1)
Negative	512 (99)
Family history of hereditary disease(s)	
Positive	71 (14)
Negative	445 (86)

3.2. Medical students' knowledge about PMS

Table (2) shows that most of the respondents ($n=473$; 92.0%) knew the importance of PMS in reducing the occurrence of genetic and sexually-transmitted diseases. The unavailability of a PMS program in Yemen was perceived by 72.0% (370/516) of the respondents. The main sources of their information on PMS were school/university ($n=313$; 61.0%) and/or media ($n=156$; 30.0%). The vast majority ($n=499$;



97.0%) of the respondents knew that screening tests should involve both partners, whereas about one-third ($n=146$; 28.0%) of them thought that PMS includes both blood tests and physical examination.

Table 2. Knowledge of Sana'a University medical students about premarital screening (2012/2013)

Knowledge item	n (%)
PMS reduces the occurrence of genetic and sexually-transmitted diseases	
Yes	473 (92)
No	22 (4)
Do not know	21 (4)
Availability of PMS program in Yemen	
Yes	11 (2)
No	370 (72)
Do not know	135 (26)
PMS tests include:	
Blood tests only	278 (54)
Blood tests and physical examination	146 (28)
Do not know	92 (18)
Who should be tested in PMS?	
My partner	17 (3)
Both partners	499 (97)
Do not know	0 (0)
Diseases targeted by PMS include:	
Hereditary diseases only	25 (5)
Sexually-transmitted diseases only	0 (0)
Both hereditary and sexually-transmitted diseases	473 (92)
Do not know	18 (3)
Genetic blood diseases targeted by PMS include:	
Sickle cell disease	20 (4)
Thalassemia	25 (5)
Both sickle cell disease and thalassemia	439 (85)
Do not know	32 (6)
Sexually-transmitted diseases targeted by PMS include:	
Viral hepatitis B and C	4 (1)
HIV infection	52 (10)
Viral hepatitis B and C and HIV	425 (82)
Do not know	35 (7)
The main sources of information on PMS include:	
School/university	313 (61)
The media	156 (30)
Family and friends	119 (23)
Healthcare services	30 (6)

n, number of respondents; PMS, premarital screening; HIV, human immunodeficiency virus

3.3. Medical students' attitudes towards PMS

Table (3) shows that most of the respondents ($n=473$; 92.0%) believed that it is important to practice and establish PMS in the country. Moreover, 92.0% ($n=473$) of the respondents agreed to do it before marriage, and the majority of them ($n=433$; 84.0%) justified their agreement by its role in preventing the transmission of diseases to their children. Those who did not accept PMS thought that it interferes with God's will while only two of them also felt that such test results are an insult to them. The majority of the respondents ($n=433$; 84.0%) agreed to do PMS if it was requested by their partners. Regarding its timing, nearly two-thirds of them ($n=344$; 67.0%) preferred to do PMS on engagement while one-third ($n=170$; 33.0%) preferred to do it just before marriage. Responding to positive PMS results revealed that 50.0% will discontinue marriage, 24.0% ($n=122$) will decide based on the probability of disease transmission to their children, 11.0% ($n=54$) will continue marriage for different reasons and 15.0% ($n=80$) did not know what they will do. Most of the respondents ($n=425$; 82.0%) agreed to have PMS as a mandatory procedure before marriage, whereas making laws and regulations to stop marriage in case of positive results was accepted by 62.0% ($n=319$) and disagreed by 15.0% ($n=80$).

3.4. Association between medical students' characteristics and their attitudes towards PMS

Table (4) revealed no association between the socio-demographic characteristics of the students and their attitudes towards PMS.



Table 3. Attitudes of Sana'a University medical students towards premarital screening (2012/2013)

Attitude item	n (%)
Carrying out PMS is important	
Agree	473 (92)
Neutral	35 (7)
Disagree	8 (1)
PMS program should be established in Yemen	
Agree	473 (92)
Neutral	38 (7)
Disagree	5 (1)
Agreement to carry out PMS	
Agree	473 (92)
Neutral	40 (7)
Disagree	3 (1)
Reasons for agreement to carry out PMS	
To prevent transmission of diseases to my offspring	435 (84)
To ensure that my partner is healthy	211 (41)
To prevent transmission of disease to me	233 (45)
To ensure fitness for marriage	178 (34)
Reasons for disagreement to carry out PMS	
Do not want to interfere with God's will	3 (0.6)
The results may not be in the favor of my choice	1 (0.2)
Positive results may prevent marriage	1 (0.2)
Family may refuse continuation of marriage	2 (0.4)
Feeling that such test results is an insult to me	2 (0.4)
Agreement to carry out PMS if your partner asks you to do it	
Agree	433 (84)
Neutral	47 (9)
Disagree	36 (7)
What do you think about the appropriate time of doing PMS?	
On engagement	344 (67)
Just before marriage	170 (33)
After marriage	2 (<1)
Response to PMS test if you were told that you will have affected children	
Continue engagement and marriage because I believe in God	43 (8)
Discontinue engagement	260 (50)
Decision will depend on the probability of getting the disease	122 (24)
Do not know what to do	80 (15)
Continue engagement and marriage due to family pressure	9 (2)
Continue engagement and marriage due to emotional reasons	2 (<1)
Agreement on making PMS as a mandatory procedure before marriage	
Agree	425 (82)
Neutral	62 (12)
Disagree	29 (6)
Agreement on making laws and regulations to stop marriage in case of PMS test positivity	
Agree	319 (62)
Neutral	117 (23)
Disagree	80 (15)

n, number of respondents; PMS, premarital screening

Table 4. Attitudes of Sana'a University medical students towards PMS by their socio-demographic characteristics (2012/2013)

Variable	Thinking that PMS is important		Agreement on making PMS mandatory before marriage		Agreement on regulations to stop marriage in case of positive PMS tests	
	n (%)	p-value	n (%)	p-value	n (%)	p-value
Total (agree)	473 (92)		425 (82)		319 (62)	
Gender						
Female	289 (61)	0.922	260 (61)	0.896	203 (64)	0.132
Male	184 (39)		165 (39)		116 (36)	
Age (years)						
≤ 20	161 (34)	0.843	140 (33)	0.312	103 (32)	0.323
> 20	312 (66)		285 (67)		216 (68)	
Marital status						
Single	438 (93)	0.180	395 (93)	0.107	294 (94)	0.664
Married	53 (7)		30 (7)		24 (6)	
Specialty						
Medicine	161 (34)	0.623	146 (34)	0.204	110 (34)	0.481
Laboratory	222 (47)		191 (45)		136 (43)	
Nursing	90 (19)		88 (21)		72 (23)	
Academic level						
1-3	372 (79)	0.132	328 (77)	0.527	243 (76)	0.289
4-7	101 (21)		97 (23)		76 (24)	
Consanguinity between parents						
Yes	175 (37)	0.868	161 (38)	0.280	121 (38)	0.507
No	298 (63)		264 (62)		198 (62)	
Personal history of hereditary disease(s)						
Positive	5 (1)	0.650	4 (1)	0.353	3 (1)	0.591
Negative	468 (99)		421 (99)		316 (99)	
Family history of hereditary disease(s)						
Positive	66 (14)	0.823	64 (15)	0.064	45 (14)	0.773
Negative	407 (86)		361 (85)		274 (86)	

n, number of respondents; PMS, premarital screening. Fisher exact test was used for cells <5

4. Discussion

Despite the importance of practicing PMS (3, 4, 18, 19), it has yet to be established in Yemen. Several related aspects need to be evaluated before planning to adopt a PMS program in the country to ensure its benefits. One of these is the attitudes of the medical students who will be healthcare providers of such services to the public in the future. To our knowledge, this is the first study to assess the knowledge and attitudes of Yemeni medical students in Sana'a University towards PMS.

The present study revealed the perception of the importance of PMS by the vast majority of medical students, though with varying levels of knowledge regarding its various aspects. This finding is consistent with those reported by sim-



ilar studies in other Arab countries (12, 15, 16, 20). The level of Yemeni medical students' knowledge about the diseases and population groups that should be targeted by PMS is higher than that reported among medical and non-medical university students from Oman, Saudi Arabia and Syria (12, 15, 16). This could be partly attributed to the nature of their medical study, which agreed with previous studies that found the superiority of medical students over non-medical ones regarding their knowledge about PMS (13, 21). This, in turn, reflects the influence of health education on improving the knowledge and attitudes towards PMS. This is also supported by the findings by Mohammed et al. (14), who found that health education significantly improved the knowledge and attitudes of El Minia University students towards PMS.

Although most of the students in the present study knew the aim of PMS, their knowledge about its tests was inadequate. This finding is consistent with that reported among Omani university students by Al Kindi et al (15). This is possibly due to the absence of a PMS program in Yemen and the lack of students' experience in its practice. Furthermore, about one-third of the respondents were either unaware or not sure if the PMS was unavailable in the country. Confusion regarding PMS availability in the country might be attributed to the annual thalassemia awareness campaigns organized by the Yemen Society for Thalassemia and Genetic Blood Disorders during recent years.

The respondents' attitudes were, in general, positive and favored PMS. The majority of them believed that PMS is essential, and should be implemented, and they agreed to undergo it. These findings are consistent with those reported in previous studies from Oman, Saudi

Arabia, Egypt and Syria (12, 15, 16, 20). The justification of most respondents for their acceptance of PMS was mainly to avoid the transmission of diseases to their children, indicating their good understanding of its preventive aim. However, they show diverse attitudes towards PMS positive results, with a half of them agreeing to discontinue engagement. On the other hand, the decision of about one-quarter of respondents depends on the probabilities of the transmitting the disease to their children. Marriage irrespective of the positivity of PMS was reported by a small proportion ($n=54$; 11.0%) of respondents for different reasons such as family pressure, unwillingness to interfere with the God's will and love. These negative attitudes indicate that a minority of medical students still misunderstand the aim of PMS and Islamic religion. This finding was also reported in some neighboring Arabic countries (15,17,21). Therefore, these misconceptions need to be corrected through intensive religious health education by religious leaders.

The acceptance of making PMS as a mandatory premarital procedure by the majority of the respondents is consistent with that reported by Al-Aama (22) among university students in Jeddah, west of Saudi Arabia. However, the agreement of making laws and regulations to prevent the marriage in case of positive results by about two-thirds of the respondents in the present study is higher than that reported from Oman and Saudi Arabia (15, 17). This demonstrates their awareness about the serious medical problems in offspring in case of risk marriage. The disagreement exhibited by the few respondents might be changed by improving the health awareness and education by making PMS as part of their student curriculum as well as establishing a PMS program in Yemen to experience the benefits of its practicing.



Regarding the appropriate timing to perform PMS, the agreement of about two-thirds of the respondents to do it on engagement is higher than that reported among Omani university students by Al Kindi et al. (15). This indicates the good awareness of the respondents about the importance of carrying out PMS as early as possible to avoid disappointment in case of positivity.

The main source of students' information on PMS, which was reported by about two-thirds of the respondents, was schools and universities. This can be largely improved by giving educational lectures on the aims and components of PMS for students in high schools and universities. In addition, the media represent the second most important source of information on PMS. Therefore, the role of this source can be more effective in disseminating educational programs on PMS through television, radio and newspapers for mass outreach. Although friends and families represent a minor source of information on PMS reported by only about one-quarter of the respondents, such a source can be promoted by continuously providing health education to students and their families. Unexpectedly, healthcare services were the least source of information on PMS among medical students was. It is important, therefore, to expand the contribution of this source by conducting workshops, seminars and lectures on the aim, significance and components of PMS among medical staffs engaged in providing healthcare. It is noteworthy that respondents' characteristics play no role in the level of the knowledge and attitudes of medical students towards PMS, which agrees with the previously published literature (15).

Although this study represents the first attempt to explore the knowledge and attitudes of Sana'a University medical students towards

PMS, it was limited by the fact that the questionnaire was not piloted to assess its reliability and validity, which might lead to an inappropriate response rate for some questions. However, the present study is exploratory to the situation of this important health issue in Sana'a city.

5. Conclusions

The present study reveals that most of Sana'a University medical students favor the PMS, with fair knowledge about most of its components. Nevertheless, a small proportion of them disagree to mandate the PMS, and legally preventing at-risk marriages. Therefore, conducting PMS health education programs among high school and university students in Sana'a is necessary to improve their perception of PMS and to address the reservations that some might have on some of its items. A country-wide study is recommended in order to obtain a clearer understanding of such an important issue.

Authors' contributions

HAA, MMA and EFA contributed to the study design and data collection. All authors contributed to the manuscript draft and approved the final submission.

Competing interests

The authors declare that they have no competing interests associated with this article.

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