Oman Medical Journal (2012) Vol. 27, No. 4: 291-296
DOI 10. 5001/omj.2012.72

Knowledge and Attitude of University Students Towards Premarital Screening Program

Rahma Al Kindi, Salha Al Rujaibi, Maya Al Kendi

Received: 23 Apr 2012 / Accepted: 14 Jun 2012

Abstract

Objectives: The aim of this study was to explore the knowledge and attitude of Sultan Qaboos University students towards premarital screening program.

Methods: A cross-sectional study conducted at the students' clinic from January to April 2011. A self-administered questionnaire was distributed to 590 unmarried Omani students of both genders. The questionnaire consisted of 3 main parts; the first part was based on socio-demographic data, the second part dealt with the students' knowledge about the premarital screening program while the third part explored their attitudes towards the screening program.

Results: Most of the participants (n=469; 79%) were aware about the availability of premarital screening program in Oman. The main sources of information were: school/college (n=212; 36%), media (n=209; 35%), family and friends (n=197; 33%), and/or health services (n=181, 31%). The vast majority of the participants (n=540; 92%) thought it is important to carry out premarital screening and agreed to do it. Around half of the participants (n=313; 53%) favored having premarital screening as an obligatory procedure before marriage and about one third (n=212; 36%) favored making laws and regulation to prevent marriage in case of positive results.

Conclusion: Even though the majority of the participants thought it is important to carry out premarital screening; only half favored making it obligatory before marriage and one third favored making laws and regulations to prevent marriage in case of positive results. This reflects the importance of health education as a keystone in improving knowledge and attitude towards premarital screening program.

Keywords: Knowledge; Attitude; Premarital Screening Program; Premarital testing; University students; Sultanate of Oman.

Rahma Mohamed Al Kindi
Senior Registrar Family Physician, Department of Family Medicine and Public Health, Sultan Qaboos University Hospital, Sultanate of Oman.
E-mail: rkindi@squ.edu.om, alrahma23@gmail.com

Salha Al Rujaibi
Senior Specialist Family Medicine Physician
Wattaya Health Center, Directorate General of Muscat Region
Ministry of Health, Sultanate of Oman.

Maya Al Kendi
Senior Specialist Family Medicine Physician
Mabela Health Center, Directorate General of Muscat Region
Ministry of Health, Sultanate of Oman.

Introduction

Genetic blood disorders are common in Arab countries and account for a major proportion of physical and mental handicap.[1] Sickle cell anemia and thalassemia major are the most common inherited hemoglobinopathies and are a major public health problem worldwide.[2] According to the World Health Organization (WHO), approximately 240 million people are carriers for these disorders and at least 200,000 affected individuals are born annually; approximately equally divided between sickle cell anemia and thalassemia.[3]

Genetic blood disorders in the Sultanate of Oman, like all other Arab and Gulf countries, are very common and highly prevalent in the general population. The results of Genetic Blood Disorders Survey conducted in Oman in 2003 revealed that hemoglobinopathies are prevalent in Oman; the prevalence of sickle cell trait was 6% and of beta-thalassemia trait was 2%.[4] The prevalence of sickle cell disease and homozygous beta-thalassemia were 0.2% and 0.07%, respectively. From the same survey, it was calculated that in the whole Sultanate 44,733 children under the age of 5 years have glucose-6-phosphate dehydrogenase (G6PD) deficiency, 14,306 have sickle cell trait, 474 have sickle cell disease, 5393 have beta-thalassemia trait, and 175 have beta-thalassemia major. At present, the yearly increase of sickle cell anemia is 120 cases among newborn and 18-20 cases for beta-thalassemia trait.[4]

All of these genetic disorders are significant burden on healthcare systems. Their chronic nature requires life-long medical attention and expensive therapy and specialized care. For these reasons, the premarital screening (PMS) was introduced in Oman in 1999. It was initially started in Muscat region and in 2001, it was introduced in most of the regional hospitals. The PMS includes complete blood count, G6PD enzyme activity, sickle cell test, and hemoglobin electrophoresis for both partners. The PMS offers tests on voluntary basis to couples who are planning to get married and is not legally mandated. The tests would help in the detection of carriers of hemoglobinopathies that can lead to affected offspring. Several screening programs in the Gulf region and Mediterranean countries have been very effective.[5-6] However, in Oman, even though PMS exists, still its utilization is very low. This affirmed the necessity to establish a health awareness program to explain the benefits of PMS to the public and increase their awareness of the serious consequences of inherited blood disorders. Oman Hereditary Blood Disorder Association (OHBDA) was officially announced in June 2009 as a voluntary body with the

aim of improving public awareness on hereditary blood disorders and providing family counseling and support. In addition, the OHBDA is also coordinating medical and social services with the concerned organizations and institutions energizing an effective social partnership.

Studies in Arab countries have shown a significant lack of knowledge of premarital testing.[7-9] Unfortunately, there is no available data from Oman on this aspect of premarital screening program neither about its utilization or success. The purpose of this study was to explore the knowledge and attitudes of Sultan Qaboos University (SQU) students towards the premarital screening program.

Methods

A cross-sectional study was conducted at the students' clinic of the Sultan Qaboos University (SQU) from January to April, 2011. The students' clinic is part of the Department of Family Medicine and Public Health that provides primary care services to all SQU students. At the time of the study, the number of students at the university was about 15,000 and the number of visits to the clinic was around 28,000; which is nearly 2 visits per student per year.

The target population of this study was all unmarried Omani undergraduate students attending the students' clinic during the study period. Both males and females from various colleges of SQU were selected by simple random sampling and those willing to participate were enrolled in the study. A minimal acceptable sample size of 500 was calculated using the EPI Info statistical package, version 6.

A structured questionnaire with close-ended questions was designed by the authors following an extensive review of the literature on knowledge and attitude of premarital screening program.[8-15] The questionnaire was developed in English and then translated to Arabic by experts at the College of Medicine. A pilot study was conducted on a sample of 32 students to assess the reliability of the questionnaire and to check for ease and clarity of items. Questions that seemed ambiguous were then modified. The students involved in the pilot study were excluded from the final study. A self-reporting questionnaire was distributed to a sample of 590 students. The researchers gave brief explanation about the main aims of the study before distributing the questionnaires. The questionnaire consisted of 3 main parts; the first part was on the socio-demographic traits including gender, age, college, academic year, parents' consanguinity and personal and family history of hereditary diseases. The second part tested the students' knowledge regarding premarital screening program, its availability in Oman, their source of information, what it includes, who can be tested and the diseases it tests. The third part consisted of items that explored the students' attitudes towards premarital screening program.

The students were assured that their participation was voluntary and all the information would be confidential. Anonymity and confidentiality was assured and emphasized. Informed consent was obtained from all participants before completing the questionnaires. The Medical Research and Ethics Committee of the College of Medicine and Health Sciences at the Sultan Qaboos University granted ethical approval for the study in January 2011.

The data statistical analyses were conducted using STATA, Version 11.0 (STATA Corporation, College Station, TX, USA). Descriptive statistics were used to describe the sample characteristics. The *Pearson's* χ^2 tests (or Fisher's exact tests for cells less than 5) were used to test significance when appropriate and a *p*-value of ≤0.05 was considered significant.

Results

This study included a total of 590 participants. All were Omanis and unmarried with 311 (53%) females and 279 (47%) males. Their ages ranged from 18 to 27 with a mean age of 20.47 (±1.70). The socio-demographic characteristics of the participants are shown in Table 1.

Table 1: Socio-demographic characteristics of the students.

Characteristics	n(%)
Gender	
Female	311(53)
Male	279(47)
Age group (years)	
≤20	319(54)
>20	271(46)
Academic year	
1-3	402(68)
4-7	188(32)
College	
Science	136(23)
Engineering	85(14)
Arts	77(13)
Education	74(13)
Agriculture	67(11)
Commerce	66(11)
Medicine	57(10)
Laws	15(3)
Nursing	13(2)
Relationship between parents	
Yes	218(37)
No	372(63)
Type of relation between parents	
1st cousins	115(19)
2nd cousins	103(17)
Personal history of hereditary disease	
Positive	49(8)
Negative	541(92)
Family history of hereditary disease	
Positive	210(36)
Negative	380(64)

Personal history of hereditary diseases was reported by 8% (n=49) of the participants and family history of hereditary disease was reported by 36% (n=210) of them. The reported disorders were sickle cell anemia, B thalassemia and G6PD deficiency. The rest considered asthma, diabetes and hypertension as hereditary diseases. Concerning consanguinity between parents, 19% (n=115) were first cousins, 17% (n=103) were second cousins and the rest reported distant or no relationship.

Most of the participants (n=469; 79%) were aware of the availability of PMS in Oman. The main sources of information on PMS were school/college (n=212; 36%), media (n=209; 35%), family and friends (n=197; 33%), and/or health services (n=181; 31%). Almost all the participants (n=588; 99.7%) knew that the test should involve both partners. The knowledge about what tests does PMS include revealed that 33% (n=195) of the participants thought it includes blood tests alone, 32% (n=190) thought it includes blood tests and physical examination, while 35% (n=205) did not know the answer. On testing the knowledge about the diseases that are targeted by PMS, 66% (n=392) thought that PMS targets genetic blood disorders as well as sexually transmitted diseases, 25% (n=145) thought that PMS targets genetic blood disorders alone, 3% (n=16) thought that it targets sexually transmitted diseases alone and the rest (n=37; 6%) did not know the answer.

The vast majority of the participants (n=540; 92%) thought it is important to carry out PMS and agreed to do it in the future. Among those who agreed to do PMS, 88% (n=476) justified their reason as to prevent transmission of diseases to their children, 50% (n=272) for ensuring that their partner is healthy, 43% (n=254) for ensuring fitness for marriage and 41% (n=242) for preventing transmission of diseases to themselves. Among those who disagreed to do PMS (n=26; 4%), 4% (n=22) were afraid that the test results will not be in favor of their choice, 4% (n=21) felt that such test results is an insult to them, 3% (n=20) refused because they do not want to interfere with God's will, 3% (n=17) were afraid that the positive results will prevent continuation of marriage and 1% (n=6) refused because they think that their family will terminate the engagement. (Table 2)

Table 2: Attitudes of the students toward premarital screening (PMS).

Attitudes	n(%)
Thinking that carrying out premarital screening is important	
Agree	540(92)
Neutral	23(4)
Disagree	27(5)
Agreement to carry out premarital screening	
Agree	540(92)
Neutral	23(4)
Disagree	27(5)

Table 2: Attitudes of the students toward premarital screening (PMS)

-continued

Attitudes	n(%)
Reasons for agreement to carry out premarital screening	
To prevent transmission of diseases to my offspring	476(81)
To ensure that my partner is healthy	272(46)
To ensure fitness for marriage	254(43)
To prevent transmission of disease to me	242(41)
Reasons for disagreement to carry out premarital screening	
Afraid that the test results will not be in favor of my choice	22(4)
Feeling that such test results is an insult to me	21(4)
Don't want to interfere with God's will	20(3)
Afraid that a positive test will prevent continuation of marriage	17(3)
Family will refuse continuation of marriage	6(1)
Agreement on making premarital screening as an obligatory procedure before marriage	
Agree	313(53)
Neutral	184(31)
Disagree	93(16)
Thinking about the appropriate time of doing premarital screening	
In high school	65(11)
On joining college	77(13)
Before marriage	440(75)
After marriage	8(1)
Response to premarital screening test if you were told that you will have affected children	
Decision will depend on the probability of getting the disease	273(46)
Continue engagements and marry because I believe in God	115(19)
Don't know what to do	97(16)
Cancel/discontinue engagement	95(16)
Continue engagement and marriage due to emotional reasons	36(6)
Continue engagement and marriage due to family pressure	4(1)
Agreement on putting laws and regulations to stop the marriage in case of positive premarital screening test	
Agree	212(36)
Neutral	212(36)
Disagree	166(28)

On questioning about the appropriate time to undergo PMS, most (n=440; 75%) preferred to do it just before marriage, 77 (13%) on joining college, 65 (11%) in high school and 8 (1%) after marriage. The participants' response to positive PMS results showed that 46% (n=273) will decide depending on the probabilities of transmitting the disease, 26% (n=155) will continue with marriage for various

reasons like love, family pressure and not to interfere with God's will, 16% (n=95) will terminate engagement and 16% (n=97) did not know what to do. (Table 2)

Around half of the participants (n=313; 53%) agreed on having PMS as an obligatory procedure before marriage, 31% (n=184) were neutral and 16% (n=93) disagreed. Nearly one third of the participants (n=212; 36%) agreed on making laws and regulation to prevent marriage in case of positive results, 36% (n=212) were neutral and 28% (n=166) disagreed, (Table 2). Statistical analysis did not show any association between attitudes and socio-demographic characteristics of the participants at $p \leq 0.05$. (Table 3)

Table 3: Attitudes of the participants towards premarital screening by socio-demographic characteristics.

Variables	Thinking that carrying out PMS is important	*p* value	Agreement on making PMS as an obligatory procedure before marriage	*p* value	Agreement on putting laws and regulations to stop the marriage in case of positive PMS test	*p* value
Total frequency (% agree)	**540(92%)**		**313(53%)**		**212(36%)**	
Gender, n (%)						
Males	252(47%)	0.578	149(48%)	0.490	98(46%)	0.714
Females	288(53%)		164(52%)		114(54%)	
Age group in years, n (%)						
≤20	288(53%)	0.219	167(53%)	0.293	126(59%)	0.108
>20	252(47%)		146(47%)		86(41%)	
Academic year, n (%)						
1-3	364(67%)	0.306	209(67%)	0.061	152(72%)	0.314
4-7	176(33%)		104(33%)		60(28%)	
College, n (%)						
Science	129(24%)	0.177	81(26%)	0.725	47(22)	0.620
Engineering	76(14%)		41(13%)		34(16%)	
Arts	69(13%)		34(11%)		28(13%)	
Education	67(13%)		36(12%)		32(15%)	
Agriculture	62(11%)		36 12%)		20(9%)	
Commerce	56(10%)		37(12%)		26(12%)	
Medicine	55(10%)		29(9%)		19(9%)	
Laws	13(2%)		10(3%)		3(1%)	
Nursing	13(2%)		9(3%)		3(1%)	
Relationship between parents, n (%)						
Yes	198(37%)	0.699	123(39%)	0.401	67(32%)	0.052
No	342(63%)		190(61%)		145(68%)	
Personal history of hereditary disease, n (%)						
Positive	47(9%)	0.771	26(8%)	0.251	17(8%)	0.730
Negative	493(91%)		287(92%)		195(92%)	
Family history of hereditary disease, n (%)						
Positive	192(36%)	0.748	104(33%)	0.104	73(34%)	0.813
Negative	348(64%)		209(67%)		139(66%)	

Discussion

On planning any preventive program, many aspects need to be considered to ensure its success. In a program like premarital screening, there is a great need to focus on the target population, mainly unmarried young adults such as university students because their beliefs and attitudes will affect their choices in life including their choice on a partner. The importance of PMS cannot be overemphasized as many countries have shown its usefulness and effectiveness in decreasing the incidence of diseases tested for.[5-6]

In spite of the importance of the PMS program in Oman, this is the first study to our knowledge that explores this subject among Omani citizens.

The results of this study clearly showed that the participants were aware about the availability of PMS in Oman but their knowledge was inadequate about its various aspects such as what it includes and what diseases it targets. This finding is consistent to what was reported in similar studies in Egypt, Saudi Arabia and Syria.[8-10] This could be due to the participants' young age (mean= 20.60) where they lack the ability to appreciate the seriousness of the genetic blood disorders and its huge impact on the emotional and financial status of the affected families. Health education should be directed towards improving young adults' knowledge of these issues.

Two-thirds of the participants thought that PMS screens for genetic disorders as well as sexually transmitted diseases. This can be explained by the fact that the students' clinic, where the study was conducted, is under the Sultan Qaboos University Hospital (SQUH) and not under the Ministry of Health (MOH). The services provided and facilities available at the students' clinic are quite different from those at the MOH. In both institutes, PMS is provided on request and includes screening for genetic blood disorders like sickle cell disease and beta thalassemia. However, SQUH also provides screening for sexually transmitted diseases. This might have confused the students with the PMS program.

The participants' attitudes towards PMS were favorable, where the majority believed that PMS is important and agreed to carry it out in the future. This is similar to what has been reported in other Arab countries.[8,10-11] The majority of the participants reported that they will perform PMS to prevent transmission of diseases to their children. This reflects that the participants had a good understanding of the preventive value of PMS.

A minority of the participants refused or was not sure about carrying out PMS. They listed various reasons such as feeling that such test is an insult to them, afraid that the test results will not be in favor of their choice, they do not want to interfere with God's will, afraid of a positive result which will prevent continuation of marriage and because they think that their families will refuse continuation of marriage. This reflects that some students were still unaware of the importance of PMS and that they consider mandatory procedures as an insult on an individual's freedom. All these reasons can be contributed to the misunderstanding of the aim of PMS and misconception of the Islamic rules. This misunderstanding was also observed in studies conducted in Saudi Arabia.[11-12] Therefore, religious leaders are strongly recommended to take part in correcting this mistaken belief.

Making PMS as an obligatory procedure before marriage was favored by about half of the participants and around one-third of them favored putting laws and regulations in place to prevent marriage in case of positive results. This is far lower than what was found in Saudi Arabia where 85% agreed on making PMS as a mandatory procedure before marriage and 63% agreed on legal interference in case of positive results.[11] One of the reasons for such choices is the high rate of consanguineous marriages among the Omani population; in which a procedure like PMS might create some social annoyance and break the autonomous of the family. Therefore, this negative attitude could be improved by intense health education especially for those at high risk of transmitting genetic disorders.

When asked about the appropriate time of carrying out PMS, the majority of the participants preferred to do it just before marriage. This illustrates that PMS is actually considered as an accessory to complete the process of marriage preparation and not as an essential step. For that, the participants' response in case of positive PMS results showed that almost half will decide depending on the probabilities of transmitting the disease to their children and quarter will continue with marriage for various reasons such as not to interfere with God's will, love and family pressure and only 16% will terminate engagement and similar percentage did not know what to do.

About one third of the participants have obtained their information on PMS from schools and colleges. This can be significantly improved by adapting various strategies such as including PMS program in the schools' curriculum and arranging regular educational lectures on PMS and its objectives. Another important source of information on PMS was family and friends. Health education on this matter should be simultaneously provided to students and their families. Proper premarital counseling would also help to disseminate the information on PMS program and will result in increased utilization.

An additional source of information on PMS that was reported by nearly one third of the participants was the media. This reflects that its role is still not fully utilized to circulate the significance of PMS as a preventive program. Attention needs to be focused on this aspect too.

Health care services came in fourth place as an important source of information about PMS. This indicates that the healthcare services are not as efficient as expected in spreading information on PMS and more effort is required on this regard. The role of the healthcare services can be further amplified by involving doctors, nurses and health educators in workshops that explain the essential components of the PMS program and encourage them to use every opportunity in giving health education on PMS.

Conclusion

This study showed that most of the students have a positive attitude towards PMS but inadequate knowledge about which diseases it targets. Even though the vast majority of them thought it is important to carry out PMS and agreed to do it, only half of them agreed that it should be made a mandatory procedure before marriage and no more than a third agreed on making laws and regulation to prevent marriage in case of positive results. The results of this study reflect the importance of health education as a keystone in improving knowledge and attitude towards PMS.

Acknowledgements

We would like to thank the SQU students for their participation in this study and all the staff at the students' clinic for their cooperation in this project. Special thanks to Ms. Bahiya Al Siyabi, the coordinator of the Department of Family Medicine and Public Health for her continuous support. No conflict of interest was reported and no funding was declared for this article.

References

1. Ahmad S Teebi and Talaat I Farag. Genetic Disorders Among Arab Populations. Second edition. Springer. 2010
2. Old JM. Screening and genetic diagnosis of haemoglobinopathies. Scand J Clin Lab Invest 2007;67(1):71-86.
3. Hereditary anaemias: genetic basis, clinical features, diagnosis, and treatment. WHO working group. Bull World Health Organ 1982;60(5):643-660.
4. Al-Riyami A, Ebrahim GJ. Genetic Blood Disorders Survey in the Sultanate of Oman. J Trop Pediatr 2003 Jul;49(1)(Suppl 1):i1-i20.
5. Al Arrayed S. Campaign to control genetic blood diseases in Bahrain. Community Genet 2005;8(1):52-55.
6. Bozkurt G. Results from the north cyprus thalassemia prevention program. Hemoglobin 2007;31(2):257-264.
7. Abdel-Meguid N, Zaki MS, Hammad SA. Premarital genetic investigations: effect of genetic counselling. East Mediterr Health J 2000 Jul;6(4):652-660.
8. Eshra DK, Dorgham LS, el-Sherbini AF. Knowledge and attitudes towards premarital counselling and examination. J Egypt Public Health Assoc 1989;64(1-2):1-15.
9. Gharaibeh H, Mater FK. Young Syrian adults' knowledge, perceptions and attitudes to premarital testing. Int Nurs Rev 2009 Dec;56(4):450-455.
10. Al-Aama JY, Al-Nabulsi BK, Alyousef MA, Asiri NA, Al-Blewi SM. Knowledge regarding the national premarital screening program among university students in western Saudi Arabia. Saudi Med J 2008 Nov;29(11):1649-1653.
11. Al-Kahtani NH. Acceptance of premarital health counseling in Riyadh city, 1417H. J Family Community Medicine 2000;7:27-34.
12. Al-Khaldi YM, Al-Sharif AI, Sadiq AA, Ziady HH. Attitudes to premarital counseling among students of Abha Health Sciences College. Saudi Med J 2002 Aug;23(8):986-990.
13. Al Sulaiman A, Suliman A, Al Mishari M, Al Sawadi A, Owaidah TM. Knowledge and attitude toward the hemoglobinopathies premarital screening program in Saudi Arabia: population-based survey. Hemoglobin 2008;32(6):531-538.
14. Al-Aama JY. Attitudes towards mandatory national premarital screening for hereditary hemolytic disorders. Health Policy 2010 Sep;97(1):32-37.
15. Al-Aama JY, Al-Nabulsi BK, Alyousef MA, Asiri NA, Al-Blewi SM. Knowledge regarding the national premarital screening program among university students in western Saudi Arabia. Saudi Med J 2008 Nov;29(11):1649-1653.