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AWARENESS OF THE PRE-MARITAL SCREENING AMONG STUDENTS AT THE COLLEGE OF APPLIED MEDICAL SCIENCES IN TAIF UNIVERSITY

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Abstract:

Background: Premarital screening is an extensive batch of tests created especially for those getting ready to get married. These tests are intended to detect infections and inherited disorders as well as any health problems that may impact fertility. Pre-marital blood test awareness, attitudes, and opinions were evaluated in this survey of Taif University second year (group A) and fourth year (group B) male and female applied medical science students.

Materials and Method: The study involved 38 participants from group A and 43 participants from group B, who were surveyed over a three-week period. A link to the survey emailed and it distributed through various online platforms to students who agreed to participate in this survey.

The results showed that pre-marital blood tests were known to most participants in both groups prior to their enrolment in the applied medical science college. Group B mostly obtained information from lectures in the classroom, but group A used a variety of sources, including social media, internet sites, family, and general information. Pre-marital testing has cultural and religious implications, which both groups acknowledged. Compared to group B, group A showed a greater proportion of participants who supported requiring pre-marital blood testing for all new couples. Furthermore, group B showed more variability in their responses to the various tests included in pre-marital screening. Most participants from group A believed that pre-marital screening should be mandatory for all new couples and expressed higher confidence in explaining its importance to others compared to group B. Both groups indicated a preference for online videos or webinars as educational sources to improve awareness about pre-marital screening. Healthcare professionals were seen as having a crucial role in providing clear information and collaborating with leaders to promote society-wide awareness. While both groups expressed willingness to participate in awareness campaigns, group A showed a higher inclination to organize such campaigns. It is essential to comprehend the viewpoints of medical science students in order to evaluate the program's acceptability and efficacy among prospective medical professionals.

Conclusion: The study highlights the importance of continuous efforts to educate and inform the public about pre-marital screening to maximize its benefits and prevent genetic disorders in future generations.

Introduction

Premarital screening and genetic counseling (PMSGC) are a comprehensive program offered to couples planning to get married that assists several important purposes in each society (31). According to The World Health Organization (WHO) it recommends all new couples to have a premarital screening (PMS) as a preventive measure for genetic diseases, infectious, or transmissible diseases that could affect them or their offspring (6).

One of the major points is the reduction of inherited diseases spread by identifying genetic disorders that can be transmitted to children such as thalassemia and sickle-cell anemia (SCA). Moreover, PMSGC is testing for some infectious diseases that can be transmitted to the other partner such as hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) which can affect the health of the partner and children as well (1,6,29,40). Raising awareness about these diseases, promoting comprehensive healthy marriages and healthier life for the new generation are one of the fundamental issues that PMSGC program is seeking for.

In 1973, Cyprus was mandatory screening for β-thalassemia as the first country to initiates a mandatory PMSGC test in the world for new couples before marriage due to the high occurrence of the thalassemia (22,39). Many other Middle East countries followed suit in implementing a mandatory PMSGC, especially those with high consanguinity marriage rates (23). Iran was applied PMSGC by 1997 while both Saudi Arabia and Jordan started to work with PMSGC by 2004 then Bahrain had followed them by one year later in addition in 2009 Qatar had followed them. Finally, in 2011 United Arab Emirates used PMSGC for all new couples (6,34).

These genetics and infectious tests are varied between countries based on the incidence frequency (27). For example, in Saudi Arabia, it is mandatory for SCA, thalassemia due to the higher prevalence of these conditions in the region (2,10). Moreover, sexually transmitted diseases (STD) HIV, HBV and HCV are also targeted in this screening of new couples aiming to reduce the incidence (7). In addition, in Egypt it is obligatory to screen the hemoglobinopathy (31).

In Qatar, PMSGC includes mandatory screening for thalassemia, SCA, classical homocystinuria (HCU), and cystic fibrosis, HIV, HBV and HCV, and rubella. Moreover, couples have the option to screen spinal muscular atrophy (SMA) if they need (6,10,17). In Oman, PMSGC includes mandatory screening thalassemia, SCA, Gloucose-6-phosphate dehydrogenase deficiency (G6PD) and STD such as HIV, HBV, and HCV (17, 23).

In 2001, National Premarital Screening Program (NPSP) for SCA and thalassemia was initiated in Saudi Arabia and in 2004 it was compulsory step for all new couples to receive a marriage license (7) and thus, that help to reduce the incident of hereditary diseases (17).

According to a cross-sectional study was published in Oman 2014, among random 400 citizen between age of 20-35 to examine the knowledge and attitude of Omani about PMSGC. The outcome of this study was that most of the participants were know the importance of PMSGC and 49.5% of them believed that important to make the screening mandatory for new couples

while on the other hand there are tiny number of the participants were against PMSGC. This study showed factors that affect participant's attitude toward PMSGC were gender, age, education level, and income. Thus, female, old, low educated level, high income participants were refused to approve PMSGC. Finally, that raise the flag for Omani government to take an action to educate the society about PMSGC (5).

In 2022, Al-Shafai et al published a cross-sectional study in Qatar to study the knowledge and the attitude towards PMS among Qatar University students. While 476 students were conducted in this study only 100 of them were have a minimal knowledge about PMS. So, this study revealed that despite that PMS is mandatory in Qatar for new couples, but the society still have low knowledge to ward it. This study showed medical and health students were the most participants have good knowledge and attitude towards PMS. Thus, help to identify factors that affect the knowledge towards PMS and assets the Qatari government to have awareness movement towards PMS in the society (8).

The consanguineous marriage rate is higher in Saudi Arabia comparing to other middle east countries spatially first cousin marriage and it increased among rural, low educated, low-income populations (2,9,16). The percent reach up to 56% of all marriages in Saudi Arabia (12,33). Moreover, many studies show a high link between consanguineous marriage and many hereditary disorders. Thus, unfortunately, Saudis have the highest incidence of autosomal recessive disorders in the world (2,9,14,16,22). Interestingly, that raise the importance of spread the awareness among the population and educate the Saudi society about the PMSG by showing them the consequence and risks of these marriages on couples and their offspring as well.

Furthermore, Saudi Arabian government provide a PMSGC in over 131 healthcare centers across the Kingdom. Importantly, all new couples must do the screening in a period of three months before their marriage and that is a compulsory step in the marriage process. The couples with incompatible results will consider to be revised by a counselor to assist them in order having a final decision about their marriage and that may include a marriage cancellation (12,15,18,29,35).

Studies suggest that the awareness, understanding and accepting of PMSGC among Saudi people are improve in community and influenced by many factors such as educational level, economic level, and culture beliefs (18,19,20,21,23).

Despite the fact that we cannot have an exactly global percentage of the population that believes in the importance and necessity of the pre-marriage screening, the awareness of that it is raise dynamically and can vary significantly from one region to another.

Around the world the acceptance and implementation of premarital screening programs are influenced by cultural, religious, social factors, health education and policy initiatives. In many countries they have established programs that raise awareness among the new generation to raise the health of society and reduce the financial burden on the government. Moreover,

according to some research: education level, age, and marital status for population are determined to be some of the important factors that can raise the familiarity and acceptance of premarital screening (5,8,18,19,20).

By focusing on Applied Medical Science students, due to their involvement in the healthcare field, we can gain insights into the effectiveness of current educational strategies and identify areas for enhancement to ensure these future healthcare providers are fully prepared to support, advocates and promote premarital screening.

However, it is crucial to assess their level of awareness and acceptance, as they can significantly impact the program's success through their future professional roles. Because their role is not limited to their future professional responsibilities, they also serve as a bridge to the community, often within their own families and social circles.
Therefore, understanding their awareness and attitudes towards premarital screening is crucial for the overall success of the program in Saudi Arabia.

The aim of the current study was to better understand various factors that influence and to assess applied medical science students understanding of pre-marital blood tests by measuring and comparing the level of awareness of second- and fourth-year male and female applied medical science students about the premarital screening to reflect the importance of this type of blood test and to reduce number of the inherited disease and infectious disease. We employed a survey questionnaire for addressing the research questions online.

Ethical considerations:
The study was approved by Taif University for Research Ethics committee. All participants were verbally informed at the beginning of the questionnaire about the purpose of this study. The participants' identities were kept anonymous, and their personal information was not and will not be disclosed during or after the study.

Materials and Method
Participant recruitment and Questionnaire administration

In this study we have decided to use second- and fourth-year male and female applied medical science students as inclusion criteria. All applied medical science students who agreed to participate in the survey collected from Taif University database. A link to the survey emailed and it distributed through various online platforms to students who agreed to participate in this survey.
Questionnaire design and development
We had fifteen questions covering topics to elevate the awareness level about pre-marital screening. There are diverse types of questions. For example, we have close-ended questions, Likert scale questions, yes/no questions, and text questions.
The survey was distributed through various online platforms. The data gathered among second- and fourth-year male and female applied medical science students in Taif University. We designed a questionnaire with questions covering key issues around students' knowledge about

pre-marriage blood tests, perceptions of their importance, willingness to undergo such tests, cultural and social factors influencing awareness. The frequency of students reported one time. The questionnaire developed in English and then translated into Arabic. The questionnaire survey pretested among a group of experts to confirm the survey design and text wording.

Results

Thirty-eight of second year group (A) and forty-three of fourth year group (B) male and female applied medical science students from Taif University participated in this survey in three weeks period.

For group A, 83.8 % of participants were between 18-20 years old, and the rest were between 21-23 years old. Furthermore, 78.9 % were female participants while 21.1% were males.

For group B, 7% of participants were between 18-20 years old, and the rest were between 21-23 years old. Furthermore, 55.8 % were female participants while 44.2% were males.

In this survey, group A showed 97.4% of participants stated that they have heard about pre-marriage blood tests before they enrolled to the applied medical science collage in Taif University while group B showed 95.3%.

The responses of group A and group B about how the participants learn about the pre-marriage blood test was shown in figure (1). The comparison shows that classroom lectures were the main source for information to group B while other choices which includes online source, social, general information, and family were the main source of information to group A.

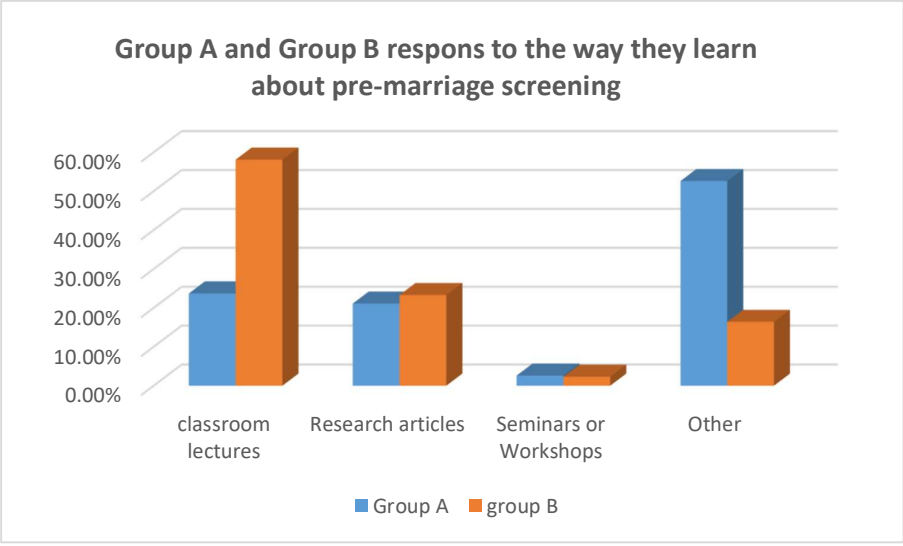

Figure 1: comparison between group A and group B on their response about how each group was learn about pre-marriage screening.

Both groups agreed that there are cultural and religious considerations related to pre-

marriage testing in their community with a similar percentage.

Interestingly, the respond toward the legalization of pre-marriage blood tests in Saudi Arabia from group A, showed a higher percentage (86.8%) of participants that agreed to make the pre-marriage blood screening mandatory for all new couples than group B which showed (71.4%) of participants.

On the same question, five participants of group A showed that they were not sure about making the pre-martial screening compulsory for all new couples while the number of participants in group B which were unsure about pre-martial screening is eleven participants.

Group B showed more variety in their answers about the tests that included in the pre-martial screening than group A. Their respond was including tests such as blood grouping, RH factor, genetic tests, and infectious diseases.

Group B showed that 55.8% of participants think the importance of pre-marriage blood tests is to prevent disease transmission. While the highest percentage of participants in group A, thought the importance of the pre-marriage screening is to detect genetic disorders. Furthermore, a minority of both groups' participants believe the importance of screening is to assess overall health.

According to groups response to the primary goal of pre-martial screening both groups showed a high percentage to identify a potential genetic disorders figure (2). The second main goal of the pre-martial screening in both groups is to determine blood type compatibility.

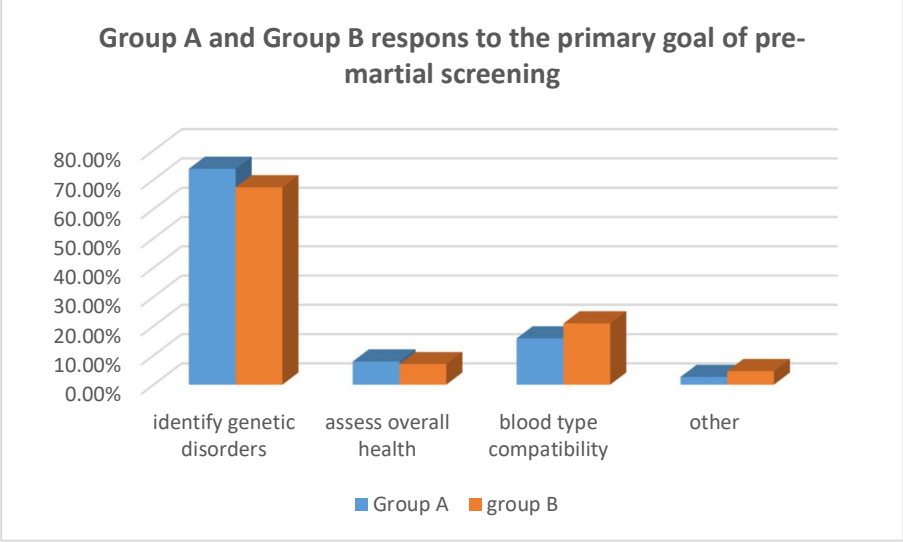

Figure 2: comparison between group A and group B on their response to primary goals of pre-martial screening for all new couples.

Group A showed 100% of participants believed that the pre-martial screening should be mandatory for all new couples while group B showed 2.3% of participants were not sure

about making the pre-marriage screening mandatory.

Surprisingly, participants in group A showed a higher confidence on their respond to explaining the importance of pre-martial screening for new couples and society (55.30%) than participants in group B (27.90%) figure (3). Furthermore, group B showed a higher percentage (9.30%) on low confidence to explaining the importance of the pre-martial screening test to new couples and the society than group A.

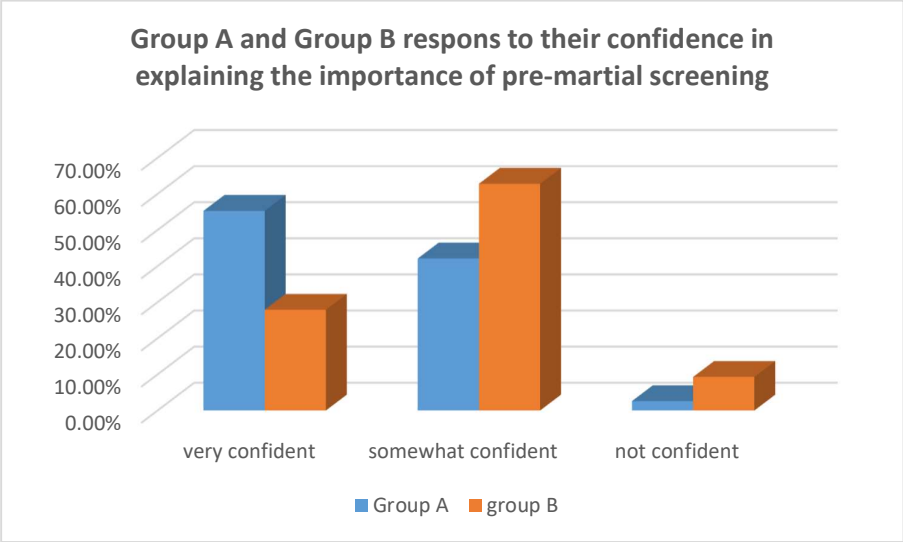

Figure 3: comparison between group A and group B on their response to participant's confidence in explaining the importance of pre-martial screening to other.

In comparison group A to group B both groups showed a higher percentage in using online videos or webinars as a source to improve their awareness about pre-martial screening than other sources with percentage (81.6%) and (65.1%) respectively figure (4). The second primary source was an expert lecture with a higher percentage in group B (27.9%) than group A (10.7%). Moreover, both groups showed similar low percentage when participants asked about using pamphlets and brochures as source of information to improve their awareness about pre-martial screening. Figure (4)

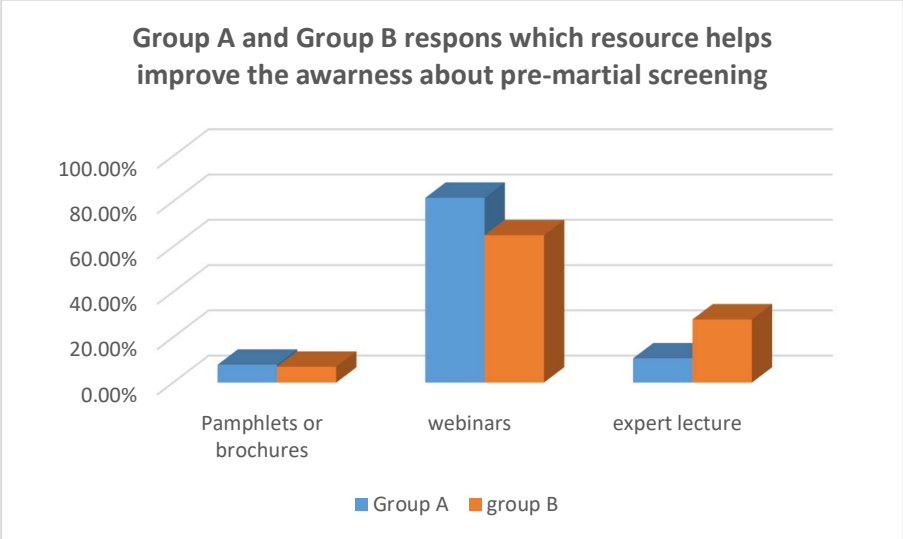

Figure 4: comparison between group A and group B on their response to sources and educational materials help to improve the awareness about pre-martial screening.

Group A and group B showed alike response about their opinion about role of healthcare professionals to encourage new couples to undergo pre-martial screening by providing clear information during pre-martial screening counselling (65.8%) and (69.8%) respectively. Moreover, collaborating between healthcare professionals and leaders to promote society awareness about pre-martial screening is the second important role of healthcare professional by participant's response. Finally, conducting a community workshop by healthcare professionals to raise society awareness about pre-martial screening represents the lowest percentage of participant's opinion.

Despite that group A showed a higher percentage of participants those are willing to organize awareness campaigns to public (68.4%) than group B (53.5%). Both groups were willing to participate in society awareness campaigns about pre-martial screening to raise and promote society awareness (60.5%) and (62.8%) respectively. Group B believed that medical science students should contribute by educating peers and community to raise awareness about pre-marriage health screenings (46.5%) while group A showed a lower percent (31.6%).

Discussion

The current study significantly contributed to our present understanding of premarital screening awareness among second- and fourth-year's male and female students at college of Applied Medical Sciences, Taif University. It provides insight into the level of awareness and interest in this topic among Saudi Arabia's new generation of highly educated individuals.

The results showed some interesting differences and similarities between Group A (second year students) and Group B (fourth year students) in terms of views toward pre-marriage blood tests, as well as perceptions of the value and awareness of such screenings.

Pre-marriage testing in society is related to cultural and religious factors, as both Group A and Group B admitted. This implies that both groups' participants are aware of how society

influences the adoption and use of premarital blood testing. According to Al-Kahtani (2000), there has been a noticeable rise in the acceptance of premarital health counselling (PMHC) among people from higher socioeconomic levels. Professionals have a remarkable 100% acceptance rate. On the other hand, participants without jobs showed the lowest acceptance rate of PMHC, with only 38.5%. Additionally, his study demonstrated the need for improved health education, especially from an Islamic perspective, in order to close knowledge gaps, especially for the young and inexperienced as well as those with low levels of education.
In fact, group A showed a higher awareness level than group B. Moreover, group A showed advanced level in their willing to participate and contribute to encourage and raise the awareness level among their community. Group A depends more on online courses or videos and webinars than using books or lectures as a source to educate themselves. Thus, university and leaders should concentrate on these sources to be highly selective and reliable sources for the new generation. Improving these types of sources with new era can help to improve general society awareness not only about premarital screening but also for overall health, new diseases and how society can prevent many diseases. The study of Alkalbani et al., (2022) revealed that the majority of the students were aware of the presence of premarital screening tests, indicating a generally high level of awareness among the Omani population. However, it was observed that some participants lacked knowledge regarding the specific components of the premarital screening test.

In our study, Group A displayed a higher level of agreement (86.8%) than Group B (71.4%) about the legality and necessity of premarital blood tests. This suggests that individuals in Group A are highly accepting blood testing prior to marriage for all new couples. It's important to keep in mind that a small portion of participants in each group said they were unclear about this issue, indicating that different perspectives existed within each group.

Premarital screening refers to a comprehensive set of tests conducted on couples who are planning to marry. These tests aim to identify potential genetic, infectious, and blood borne diseases to minimize the risk of transmitting such conditions to their offspring. The primary objective of premarital screening is to ensure the well-being and health of future children (Rahman et al., 2014).

In the Middle East, premarital screening and genetic counselling (PMSGC) programs are widely experienced due to social and religious rules that discourage having children before marriage (29). In order to reduce the prevalence of genetic diseases, several countries in the Mediterranean and Middle Eastern regions have implemented mandatory PMSGC programs (5).
The introduction of PMSGC programs began in the 1970s with the aim of eradicating β-thalassemia, a genetic disorder, across the Mediterranean region. The initial program was successfully implemented in Cyprus in 1973, resulting in a significant reduction in the number of affected babies from 51 to 8 annually between 1974 and 1979. Since 2002, there have been no reported cases of β-thalassemia births in Cyprus (27). Similar programs were subsequently implemented in Greece and Italy, leading to a complete elimination of β-thalassemia births in both countries (35).

The success of these programs can be attributed to various factors, including the provision of free prenatal diagnosis and access to abortion services. Effective education and counselling also played a crucial role. It is worth noting that less than 5% of the reductions were attributed to the divorce of engaged couples (35). The overall success of the PMSGC programs highlights the importance of comprehensive genetic counselling, education, and accessible healthcare services in reducing the incidence of genetic diseases in the region.
Aside from the Arab world, certain African and Asian nations require it as a legal requirement. The Healthy Marriage Program, formerly known as the Premarital Screening Program, was established in 2004 in Saudi Arabia. It is a mandatory screening program for individuals intending to get married in the country. The program aims to identify potential health risks in couples by screening for sickle cell disease, thalassemia, HIV, and hepatitis B and C. By making this screening mandatory, Saudi Arabia seeks to promote healthier marriages and prevent the transmission of these diseases to future generations (29).

While the effectiveness and widespread acceptance of premarital screening (PMS) were widely acknowledged in China, the mandatory nature of the policy received significant criticism from various foreign civil rights activists (30). As China undergoes a process of modernization, perceptions and attitudes towards PMS are subject to rapid change. Various social factors come into play, influencing people's views on PMS (Gao X, Yu J., 2005; Al-Aama et al., 2008).

In our study, both groups agreed that the identification of potential genetic abnormalities was the most essential goal of pre-marriage screening when questioned about its main objectives. This result demonstrates how well the participants understood the value of genetic testing in determining their chance of inheriting certain diseases. The implementation of premarital screening aims to address the challenges associated with consanguinity and reduce the occurrence of hereditary disorders (13).

Group A showed greater confidence (55.3%) than Group B (27.9%) in terms of confidence in explaining the importance of pre-marriage screening to others. However, a larger proportion of participants (9.3%) in Group B expressed uncertainty when describing the significance of the screening. These results imply that either Group A members understood the content better or were exposed to more relevant teaching resources.

Regarding the role of medical experts, both groups agreed that providing clear information during pre-marriage screening counselling is crucial. Another crucial aspect was the cooperation of leaders and healthcare experts to raise public awareness about pre-marriage screening. However, the participants were least supportive of holding community workshops to increase awareness. The participants' expectations that medical professionals will actively participate in educating and informing the community about pre-marriage blood tests are highlighted by these findings.

Finally, when it came to participants' willingness to organize or participate in awareness campaigns, Group A had a higher percentage of people who expressed a willingness to organize such initiatives than Group B. However, all groups demonstrated a similar amount of desire to

participate in societal awareness initiatives overall. Group B participants stated that medical science students should help by teaching their peers and the community, displaying their appreciation for the role they can play in raising awareness regarding pre-marriage screening among Saudi society.

Conclusion

In conclusion, premarital screening tests are a crucial element of public health strategy, and their success depends on widespread awareness and positive attitudes towards these tests. As such, continuous efforts to educate and inform the public are essential to maximize the benefits of premarital screening programs worldwide and to increase the acceptance, utilizing of this program leading to prevent some of the genetic disorders and having healthier generations globally.

Conflict of interest

None

Acknowledgement

None

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