

Awareness Regarding Health Hazards of Consanguineous Marriage among Saudi Adults in Medina, 2016

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ABSTRACT

Background: Consanguineous marriages are strongly favoured in the Saudi population. It's well known that consanguineous marriage is related to many health hazards to the offspring and the most important factor in its limitation is the awareness and education of the population of these hazards.

Objectives: To determine the prevalence and socio-demographic determinants of consanguineous marriage as well as to assess the awareness and attitude towards the health hazards of consanguineous marriage among Saudi adults in Medina city, Saudi Arabia.

Subjects and Methods: This is an observational cross-sectional study which is based on an electronic self-administered questionnaire that was distributed to Saudi adults in Medina through social media. A representative sample of around 2000 of participant living in various area of Medina was selected randomly. The questionnaire contains four sections; socio-demographic characteristics, the prevalence of consanguineous marriage and the causes behind favoring this marriage in our society, questions regarding the knowledge and awareness about inherited disease and its relation to consanguineous marriage and questions regarding the knowledge about the premarital counseling and the attitude towards the marriage if the results showed risk to their offspring.

Results: The study population included a random sample of 1334 adults. Most of them (79.7%) were males and majority were Saudis (91.4%). Among ever-married subject (n=737), relative's marriage was reported by 40.8% of the participants. Of them (n=301), 87% married their cousins. Most of the participants (81.3) could recognize that consanguineous marriage increases the probability of genetic diseases. The

commonest reported sources were mass media (40.5%), schools (29.5%) and health care specialist (19%). Only 50% of the participants could recognize that pre-marriage medical test helps in preventing the transmission of hereditary blood disease, sickle-cell anemia and Thalassemia. Majority of them (88.8%) knew that abnormal pre-marriage test cause social or psychological problems. Most of the respondents (81.8%) said that they would finish that marriage if they got abnormal results.

Conclusion: This study showed high prevalence of consanguineous marriage among Saudi adults in Medina. Saudi Adults had good awareness regarding the health hazards of consanguineous marriage, had good awareness towards the premarital screening, and had negative attitude towards the consanguineous marriage if they informed about harmful effect of their offspring.

Keywords: Consanguineous Marriage, Knowledge, Saudi Arabia, Electronic Questionnaire.

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INTRODUCTION

Consanguinity it is a Latin word comes from "consanguinitas" and it is mean blood relation. In that aspect, Consanguinity described as unions between couples who share at least one common ancestor. According to the World Health Organization' guidelines, a consanguineous marriage is defined as a marriage between people who are second cousins or more closely related.¹

Consanguineous marriages are strongly favoured in the Saudi population. In Riyadh, capital of Saudi Arabia, the prevalence of consanguineously marriage was more than half of the population 51.3 %, ² whereas a higher rate recorded was reported in Madina in 2007 (67.2%).³

It's well known that consanguineous marriage is related to many

health hazards to the offspring and the most important factor in its limitation is the awareness and education of the population of these hazers. In 2015, 41.2 % of adult in Riyadh was below the average in the knowledge about consanguineous marriage.⁴

It is estimated that one billion of the current global population live in communities with a preference for consanguineous marriage especially in Muslims countries.⁵ In Saudi Arabia, a study revealed that the overall rate of consanguinity shows that 57.7% of the families screened were consanguineous. The most frequent were first cousin marriages (28-4%) followed by distant relative marriages (15-2%) and second cousin marriages (14-6%). In fact, consanguinity is influenced by geographic, demographic, religious, cultural, and socio-economic factors, however in Saudi Arabia, significant differences was reported among the populations in the different areas. The highest rate of consanguinity was 80.6% in Samtah and the lowest rate was around 34% in Abha in the South Western province.⁶

The most prevalent illnesses reported in the offspring of consanguineous marriages are asthma, congenital heart defects, hearing loss, and Down's syndrome. Other associated illnesses are mental retardation and intellectual disability, epilepsy, diabetes, mild to serious cognitive disability of the offspring due to birth defects, and pro-reproductive mortality.⁴ Furthermore, consanguineous marriages play an important role in the increased appearance of autosomal recessive diseases due to the facilitation of the expression of autosomal recessive mutated inherited factors from a common ancestor.⁴

The identification of carrier status through premarital screening, and providing people with suitable counseling is undertaken in Saudi Arabia. Premarital Screening: defined as conducting examination for soon-to-be married in order to identify if there is any injury with genetic blood diseases such as sickle-cell anemia (SCA) and thalassemia, and some infectious diseases such as hepatitis B, C and HIV "Aids".⁷ In 2004 Premarital Screening has become a mandatory requirement by the ministry of health to decrease the incidence of these genetic disorders in future generations.⁸ The results from screening programs for inherited blood disorders like β - thalassemia and sickle cell diseases showed that while 90% of couples in Saudi Arabia were at a greater risk to have affected children in the future, they still decided to get married to avoid embarrassment among their families due to possible nullification of their wedding ceremonies.⁴ This study aimed to determine the prevalence and socio-demographic determinants of consanguineous marriage as well as to assess the awareness and attitude towards the health hazards of consanguineous marriage among Saudi Adults in Medina city, Saudi Arabia.

SUBJECTS AND METHODS

This is an observational cross-sectional study which is based on an electronic self-administered questionnaire that was distributed to Saudi adults in Medina through social media. A representative sample of around 2000 of participant living in various area of Medina was selected randomly.

All eligible participants who agreed to participate were requested to fill the questionnaire on the spot. On average a questionnaire filling required almost five minutes to complete.

The questionnaire contains four sections. The first section is about socio-demographic characteristics which include age, gender,

marital status, nationality, residency and occupation. Second section determines the prevalence of consanguineous marriage and the causes behind favoring this marriage in our society. Third section includes the questions regarding the knowledge and awareness about inherited disease and its relation to consanguineous marriage. Fourth section is including questions regarding the knowledge about the premarital counseling and the attitude towards the marriage if the results showed risk to their offspring.

Raw data were processed and cleaned to identify any anomalies prior to statistical analysis. The statistical analysis program (SPSS v.22) was been used in the study in data entry and analysis, with the use of description in the form of frequency and percentage as well as analysis using chi-square test. P-value less than 0.05 was utilized as a cut-off for statistical significance.

Table 1: Personal data for the participants (n = 1334)

Variable		Number	%
Gender	Male	1063	79.7
	Female	271	20.3
Nationality	Saudi	1219	91.4
	Others	115	8.6
Age (years)	< 20	162	12.1
	20- 30	653	49.0
	31- 40	264	19.8
	41- 50	177	13.3
	> 50	78	5.8
Marital status	Single	597	44.8
	Married	701	52.5
	Divorced	36	2.7
Education level	Primary	16	1.2
	Intermediate	69	5.2
	Secondary	277	20.8
	University	906	67.9
	Postgraduate	66	4.9

Table 2: Consanguineous marriage among ever-married participants

Answer	Number	(%)
Consanguineous marriage (n=737)		
Yes	301	(40.8)
No	436	(59.2)
Relation (n=301)		
Cousin	262	(87.0)
Other	39	(13.0)

RESULTS

The study population included a random sample of 1334 adults. Table 1 shows their personal data. Most of the participants (79.7%) were males. Majority were Saudis (91.4%). Almost half of them (49%) aged between 20 and 30 years. While only 5.8% of them aged more than 50 years. According to the marital status, 52.5% of them were married and according to their educational level, 67.9% of the participants had university level.

Among ever-married subject (n=737), relative's marriage was reported by 40.8% of the participants. Of them (n=301), 87% married their cousins.

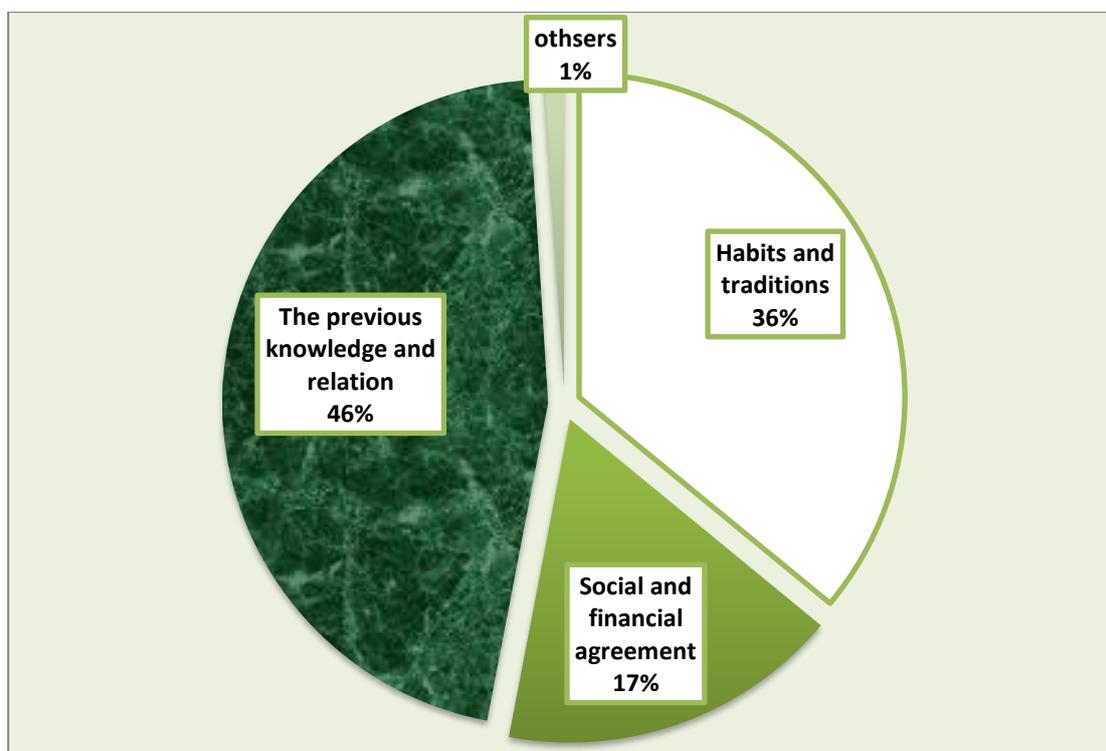


Figure 1: Reasons of preferring consanguineous marriage in Saudi society.

Table 3: Responses of the participants to knowledge questions and statements

	Correct answers	
	No.	%
▪ Consanguineous marriage increases the probability of genetic diseases.	1085	81.3
▪ Genetic disease is a disease caused by inheriting the abnormal gene from both parents	1221	91.5
▪ Pre-marital medical test helps in preventing the transmission of hereditary blood disease, sickle-cell anemia and Thalassemia	667	50.0
▪ Pre-marriage medical test is enough to prevent genetic diseases inheritance	699	52.4
▪ Abnormal pre-marriage test cause social or psychological problems	1184	88.8
▪ Disagreed with consanguineous marriage after getting abnormal pre-marriage test.	1091	81.8

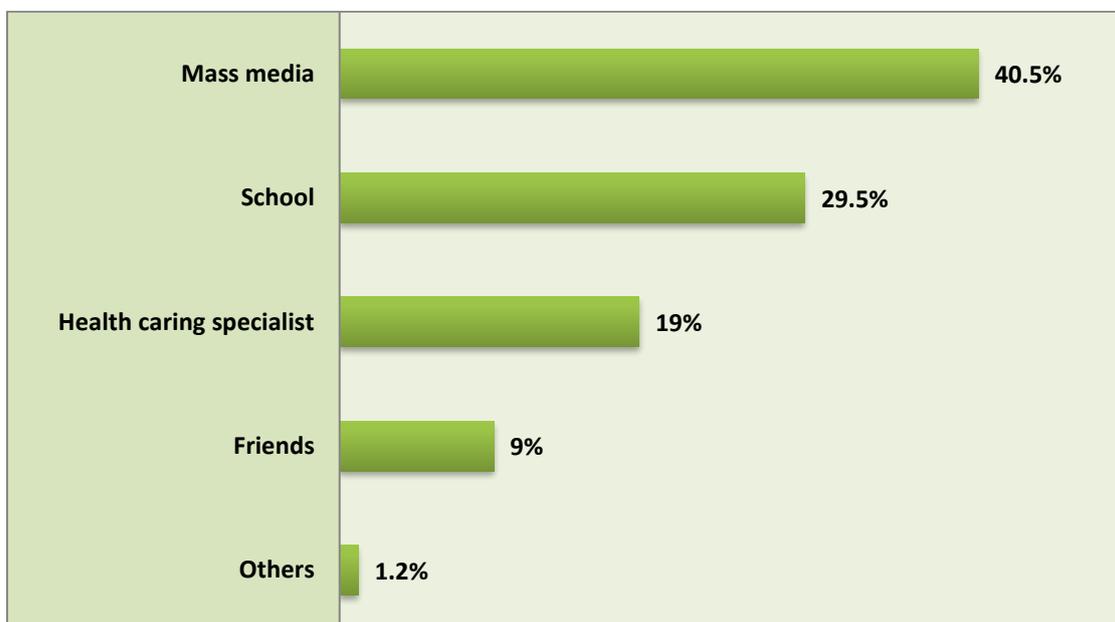


Figure 2: Source of information about genetic diseases among the participants.

Figure 1 presented the reasons of preferring consanguineous marriage in Saudi society. Slightly less than half of them (46%) reported previous knowledge between couples, while 36% of them mentioned habits and traditions and 17% reported social and financial agreement.

Table 3 summarized the responses of the participants to knowledge questions and statements. Most of them (81.3) could recognize that consanguineous marriage increases the probability of genetic diseases; mentioned diseases were blood diseases (49%), diabetes (35%) and Down syndrome (16%). Most of the

participants (83.3%) claimed that they know what is meant by a genetic disease. Their sources of information are illustrated in figure 2. The commonest reported sources were mass media (40.5%), schools (29.5%) and health care specialist (19%). Majority of the participants (91.5%) knew that genetic disease is a disease caused by inheriting the abnormal gene from both parents. Also majority of the participants (95.4%) reported that they know what the pre-marital medical test is. The commonest reported sources were mass media (45.8%), friends (29.9%) and health care specialist (13.8%). (Figure 3)

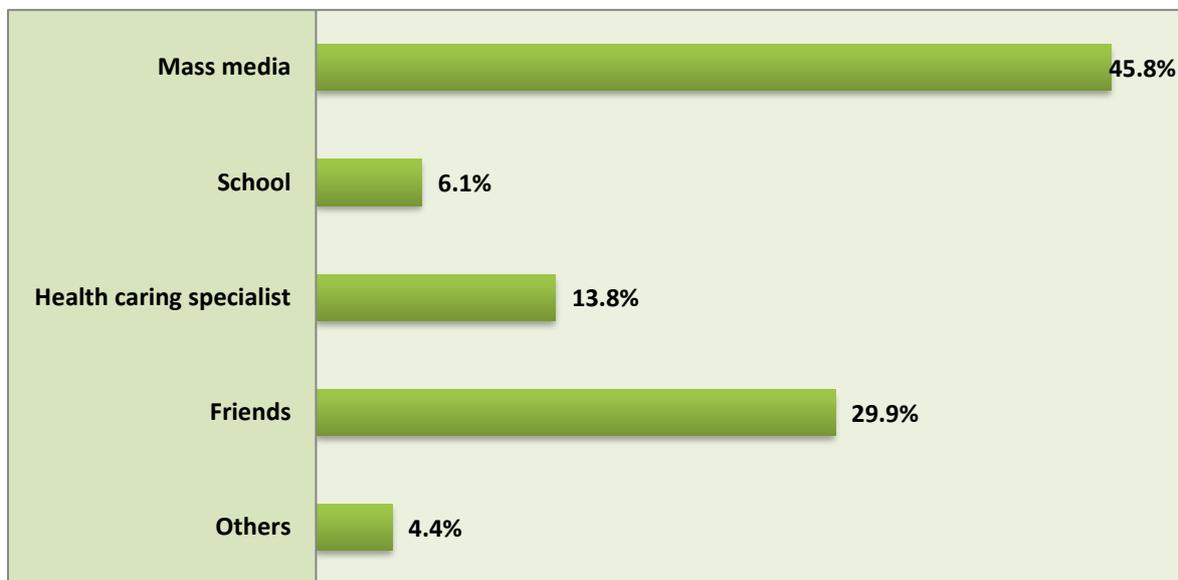


Figure 3: Source of information about pre-marriage medical test.

Table 4: Factors associated with knowledge of consanguineous marriage hazards among participants

	Knowledge of consanguineous marriage hazards		p-value*
	Good N=1050	Poor N=284	
Gender			
Male (n=1063)	848 (79.8)	215 (20.2)	0.060
Female (n=271)	202 (74.5)	69 (25.5)	
Nationality			
Saudi (1219)	964 (79.1)	255 (20.9)	0.282
Others (n=115)	86 (74.8)	29 (25.2)	
Age (years)			
<20 (n=162)	126 (77.8)	36 (22.2)	0.159
20-30 (n=653)	526 (80.6)	127 (19.4)	
31-40 (n=264)	194 (73.5)	70 (26.5)	
41-50 (n=177)	144 (81.4)	33 (18.6)	
>50 (n=78)	60 (76.9)	18 (23.1)	
Marital status			
Single (n=597)	485 (81.2)	112 (18.8)	0.008
Married (n=701)	543 (77.5)	158 (22.5)	
Divorced (n=36)	22 (61.1)	14 (38.9)	
Educational level			
Primary (n=16)	11 (68.8)	5 (31.2)	<0.001
Intermediate (n=69)	51 (73.9)	18 (26.1)	
Secondary (n=277)	197 (71.1)	80 (28.9)	
University (n=906)	730 (80.6)	176 (19.4)	
Postgraduate (n=66)	61 (92.4)	5 (7.6)	

* Chi-square test

Only 50% of the participants could recognize that pre-marriage medical test helps in preventing the transmission of hereditary blood disease, sickle-cell anemia and Thalassemia. More than half of the participants (52.4%) believed that pre-marriage medical test is enough to prevent genetic diseases inheritance. Majority of them (88.8%) knew that abnormal pre-marriage test cause social or psychological problems. Most of the respondents (81.8%) said that they would finish that marriage if they got abnormal results.

Most of single participants (81.1%) had good knowledge regarding consanguineous marriage hazards compared to married (77.5%) and divorced (61.1%) participants, $p=0.008$. High educated participants (postgraduate) were more knowledgeable compared to lower educated (primary school) (92.4% versus 68.8% had good knowledge), $p<0.001$. (Table 4)

DISCUSSION

Consanguinity is prevalent in many Middle Eastern and Arab cultures and societies.⁹ Some studies have shown significant differences in the rates of genetic disorders between children born to consanguineous marriage partners and those born to non-consanguineous parents,¹⁰ while others have found no significant differences.¹¹ Marriage between close biological relatives is generally regarded with suspicion and distaste. The rates of consanguineous marriages the Middle East, and especially in Saudi Arabia, vary in different studies from 22%-55% of the population, and, therefore, it appears to be more of an eastern tradition, especially in Saudi Arabia where the population has a preference for consanguinity for many social and traditional reasons.⁴ So this study aimed to assess the awareness regarding health hazards of consanguineous marriage among Saudi adults.

In the present study, the rate of consanguineous marriage was 40.8%. This figure is close to what has been reported previously by Ahmed et al. (50.3%).⁴ Generally speaking, from both studies, it is obvious that at in Saudi Arabia, the rate of consanguineous marriage is still high. In Qatar, Bener et al. reported also a high rate of consanguineous marriages (54%).⁹ Additionally, Shawky et al., reported a relatively high rate of consanguineous marriage in Egypt (35.3%).¹² Majority of consanguineous relationship (87%) were between cousins in the current study. In Qatar Bener et al.⁹ the most common form of consanguineous relationship again was between first cousins. In Jordan, 20–30% of all marriages were cousin mating and 69% of these are first cousin.¹³

Consanguineous marriage may be more favorable for the women's status, including the wife's better relationship with her in-laws who could support her in time of need. There is a general belief that marrying within the family reduces the possibilities of hidden uncertainties in health and financial issues. It is believed that consanguinity strengthens family ties and enforces family solidarity, with cousin marriage providing excellent opportunities for the transmission of cultural values and cultural continuity.¹⁴ Premarital negotiations regarding financial matters of marriage are more easily conducted and sometimes less costly. Wife's parents prefer to have their daughter living near them and to enjoy the presence of their grandchildren. Moreover, wealthy landlords may prefer to keep their property within the family.^{15,16} The most common reasons of preferring relatives marriage in the present study were previous knowledge between couples, habits and traditions, and finally for social and financial agreement. This finding disagrees with Alharbi et al., results who found that the

most common reason of preferring Saudi society relatives was social and traditional factors.¹⁷

Regarding knowledge and awareness about genetic diseases, and their relation with relative's marriage, the participants showed overall good knowledge and awareness about genetic diseases, particularly among higher educated subjects. Health care providers and genetics specialists could consider both the negative impact of consanguineous marriage in terms of increased genetic risks to the offspring, as opposed to the potential social and economic benefits.¹⁸ In the current survey, most of participants thought that the genetic disease probability increase with relative marriage and thought that they have the required knowledge about genetic diseases.

Most of the literature studying the association of Down syndrome with parental consanguinity concluded that no such association existed. The association of consanguineous marriages with late onset complex diseases such as diabetes, cardiovascular disorders, schizophrenia and cancer requires further studies to precise any existing risks because currently unambiguous evidence-based conclusions are difficult to establish.¹⁸ In the present study, the majority thought that the most distributed genetic diseases caused by relatives marriage were blood diseases, while 35% of them thought that it is diabetes, only 16% of them thought that these diseases are down syndrome and general disabilities.

The source of information among 40.5% of participants in the current survey was Mass media. Social media had been shown in different studies to be effective in increasing awareness, especially in areas where people do not have access to specialized knowledge or experience, and aids in constructing and changing of attitude towards different health issues.^{19,20} Only 19% of participants got their information from health caring specialists; However, education of the health caring specialists in particular is an important pillar in clarifying the health and social effects of consanguineous marriages.

The offspring of consanguineous unions may be at increased risk for recessive disorders because of the expression of autosomal recessive gene mutations inherited from a common ancestor.²¹ Majority of the participants (91.5%) in the current study thought that genetic diseases cause by abnormal genes inherited from parents.

Regarding pre-marriage medical test, most of participants of the present work have the required knowledge pre-marriage medical test, the majority got their knowledge from mass media, about half of the participants said that it helps in preventing the transmission of hereditary blood disease.

In this study, 81.8% of participants would finish the marriage if they got abnormal results. Previous studies in the Netherlands among migrant populations, report that although preconceptional testing is generally evaluated as positive,^{22,23} there is more reluctance toward prenatal testing and termination of pregnancy in some populations.^{22,24}

Among important limitations that should be mentioned in this study is its conduction through electronic questionnaire which means that those who hadn't internet access were not included which could affect generalizability of results. However, inclusion of large sample size could minimize this effect.

In conclusion, this study showed high prevalence of consanguineous marriage among Saudi adults in Medina. Saudi

Adults had good awareness regarding the health hazards of consanguineous marriage, had good awareness towards the premarital screening, and had negative attitude towards the consanguineous marriage if they informed about harmful effect of their offspring. Therefore, it is recommended to conduct awareness campaigns to warn of the negative effects of consanguineous marriage, hold seminars and distribute pamphlets among college students to make them aware of the negative effects of consanguineous marriage, the exploitation of the media and social networking sites larger to awareness towards consanguineous marriage and increase awareness of premarital testing phenomena.

REFERENCES

1. Parry J. Low- and middle-income countries are catching up on the use of screening for birth defects. *Bulletin of the World Health Organization* 2012 Aug;90(8): 557-632
2. Al Husain M, Al Bunyan M. Consanguineous marriages in a Saudi population and the effect of inbreeding on prenatal and postnatal mortality", *Annals of Tropical Paediatrics* 1997, 17(2):155-160
3. El-Mouzan MI, Al-Salloum AA, Al-Herbish AS, Qurachi MM, Al-Omar AA. Regional variations in the prevalence of consanguinity in Saudi Arabia. *Saudi Med J*. 2007 Dec;28(12):1881-4.
4. Ahmed AE, Alharbi OA, Al-Hamam AA, Al-Shaia WA, Al-Marzoug HM, Bagha M. Awareness of health consequences of consanguineous marriages among Saudi adults. *Journal of Public Health in Developing* 2016;2(1):121-129.
5. Bittles A. Consanguinity and its relevance to clinical genetics. *Clin Genet*. 2001;60:89-98.
6. Mohsen A F El-Hazmi, A R Al-Swailem, A S Warsy, A M Al-Swailem, R Sulaimani, A A Al-Meshari . Consanguinity among the Saudi Arabia Population, 1995;32:623-626.
7. Ministry of health Protal, Kingdom of Saudi Arabia. Overview of Premarital Screening. [Last Update: 08 April 2014] [<http://www.moh.gov.sa/en/healthawareness/beforemarriage/Pages/default.aspx>.]
8. Khalil EMF, Abdelkader SM, Alsaeed MD, Alshahrany NM. Knowledge, Beliefs and Behavior Intention about Premarital Screening among King Saud University Female Students in Riyadh Sch. *J. App. Med. Sci.*, 2014; 2(5E):1797-1805
9. Bener A, Hussain R. Consanguineous unions and child health in the State of Qatar. *Paediatr Perinat Epidemiol*. 2006 Sep; 20(5):372-8.
10. Jaouad IC, Elalaoui SC, Sbiti A, Elkerh F, Belmahi L, Sefiani A. Consanguineous marriages in Morocco and the consequence for the incidence of autosomal recessive disorders. *J Biosoc Sci*. 2009 Sep; 41(5):575-81.
11. El Mouzan MI, Al Salloum AA, Al Herbish AS, Qurachi MM, Al Omar AA. Consanguinity and major genetic disorders in Saudi children: a community-based cross-sectional study. *Ann Saudi Med*. 2008 May-Jun;28(3):169-73.
12. Shawky RM, El-Awady MY, Elsayed SM, Hamadan GE. Consanguineous matings among Egyptian population. *Egyptian Journal of Medical Human Genetics* 12.2 (2011): 157-163
13. Hamamy HA, Masri AT, Al-Hadidy AM, Ajlouni KM. Consanguinity and genetic disorders. Profile from Jordan. *Saudi Med J*. 2007 Jul;28(7):1015-7.
14. Sandridge AL, Takeddin J, Al-Kaabi E, Frances Y. Consanguinity in Qatar: knowledge, attitude and practice in a population born between 1946 and 1991. *J Biosoc Sci*. 2010 Jan; 42(1):59-82.
15. Shawky RM, Elsayed SM, Zakib ME, Nour El-Din SM, Kamal FM. Consanguinity and its relevance to clinical genetics." *Egyptian Journal of Medical Human Genetics* 14.2 (2013): 157-164.
16. Hamamy H, Bittles AH. Genetic clinics in Arab communities: meeting individual, family and community needs. *Public Health Genomics*. 2009;12(1):30-40.
17. Alharbi OA, Al-Shaia WA, Al-Hamam AA, Al-Marzoug HM, Ahmed AE, Bagha M. Attitudes of Saudi Arabian adults towards consanguineous marriage. *Qatar Med J*. 2015 Dec 31;2015(2):12.
18. Hamamy H, Antonarakis SE, Cavalli-Sforza LL, Temtamy S, Romeo G, Kate LP, et al. Consanguineous marriage, pearls and perils: Geneva International Consanguinity Workshop Report. *Genet Med*. 2011 Sep;13(9):841-7.
19. D'Alessandro AM, Peltier JW, Dahl AJ. A large-scale qualitative study of the potential use of social media by university students to increase awareness and support for organ donation. *Prog Transplant*. 2012 Jun;22(2):183-91.
20. Petrella RJ, Speechley M, Kleinstiver PW, Ruddy T. Impact of a social marketing media campaign on public awareness of hypertension. *Am J Hypertens*. 2005 Feb;18(2 Pt 1):270-5.
21. Bennett RL, Motulsky AG, Bittles A, Hudgins L, Uhrich S, Doyle DL, et al. Genetic counseling and screening of consanguineous couples and their offsprings: Recommendations of the National Society of Genetic Counselors. *J Genet Couns*. 2002 Apr;11(2):97-119.
22. Van Elderen T, Mutlu D, Karstanje J, Passchier J, Tibben A, Duivenvoorden HJ. Turkish female immigrants intentions to participate in preconception carrier screening for hemoglobinopathies in the Netherlands: an empirical study. *Public Health Genomics*. 2010;13(7-8):415-23.
23. Lakeman P, Plass AM, Henneman L, Bezemer PD, Cornel MC, ten Kate LP. Three-month follow-up of Western and non-Western participants in a study on preconceptional ancestry-based carrier couple screening for cystic fibrosis and hemoglobinopathies in the Netherlands. *Genet Med*. 2008 Nov;10(11):820-30.
24. Giordano PC, Dihal AA, Hartevelde CL. Estimating the attitude of immigrants toward primary prevention of the hemoglobinopathies. *Prenat Diagn*. 2005 Oct;25(10):885-93.

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