

The Demographic, Social and Economic Dimensions of Consanguineous Marriage and its Relationship to Genetic Diseases: Sickle Cell Anemia as a Model

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Abstract

This research seeks to analyze the demographic, social and economic dimensions of consanguineous marriage and its relationship to some genetic diseases, especially sickle cell anemia, as an attempt to limit the spread of this phenomenon in Saudi society.

The research relied on a quantitative approach using the social survey method. A questionnaire was applied to a purposive sample of families whose members were married by consanguineous marriage, numbering (254). The results of the research indicated that consanguineous marriage is the prevailing pattern in Saudi society at a rate of 72.8% and is preferred by 60.2% of the study sample. The ratio of consanguineous marriage increases in families that belong to the same tribe to reach 93.3%, due to social, cultural and economic factors. The research also concluded that 66.1% of consanguineous married couples holding a university degree. The research demonstrated the existence of a statistically significant relationship at the level of 0.05 between surrogacy and the high incidence of genetic blood disease (sickle cell anemia) in the Eastern Region. The study recommended the necessity of including reproductive health in university curricula, and encouraging youth to undergo medical examinations before marriage, and creating a database of people with genetic diseases and working with various institutions.

Keywords: *Consanguineous Marriage - Inter-marriage - Genetic Diseases - Sickle Cell Anemia- Saudi society.*

Introduction

Marriage is a demographic phenomenon that plays a major role in society and is linked to the customs, traditions and social values prevailing throughout society. Like other Islamic countries, marriage is not determined except within its legal and religious framework. It is the basis for demographic and social production, and it is considered one of the highest social systems through which psychological and social stability and biological balance are achieved.

It has been observed in Saudi society that people are willing to marry consanguineously, which has created major social problems, including divorce and strife between families, as well as the transmission of some chronic and incurable diseases, disabilities and many

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genetic diseases, such as hemoglobin diseases such as Mediterranean anemia and sickle cell anemia.

In light of the great scientific development and progress in medical research related to genetics in our time, many scientific facts were discovered that were not clear and understood in the past about the relationship of consanguinity marriage (endogamy) with genetic diseases. Some of the risks that affect children, for example, are fetal deformities, which happen frequently, especially in the recent period, necessitating interaction with the social movement in society. The importance of this topic is because some societies, especially Saudi societies, prefer consanguinity marriage for many reasons, including increasing the strength of family ties with this kind of legal bond and the desire to keep wealth within the family. Consanguinity marriage is still one of the prevailing and widespread customs, despite the clarity of the extent of the danger that may be attached to marriage in this way.

Importance of the Research

Hence importance of this study stems from its cognitive (scientific) dimension, as an important source for fields of sociology such as medical and family sociology, social demography, and anthropology. Practically, many studies indicate that consanguineous marriage is widespread in the Middle East including the Gulf countries and range between 20% and 50% such as Ben Omran's and Al-Ghanims study (2019) . Other studies reported that in Saudi Arabia the rate of consanguinity is relatively high with a rate over than 60%, and it is related to social and demographic factors such as education, profession, and social systems such as religion, culture, and tribal composition (Albarghali, 2023). Because consanguineous marriage generates serious health and economic problems, and affects the general health of society, especially reproductive health, it was necessary to determine the growth rates of this phenomenon within Saudi society in the Eastern Province exclusively due to its demographic diversity and origins, and to provide some data and suggest some preventive methods to reduce The growing phenomenon of consanguineous marriage.(Khan ; Hammadi, 2023)

Research Statement:

The research problem is determined by revealing the demographic, social and economic dimensions of consanguineous marriage in its relationship to some genetic diseases, especially sickle cell anemia, and find out methods to reduce consanguineous marriage in Saudi society.

The research attempted to deal with this case through answering the following sub-questions:

1. How widespread is the phenomenon of consanguinity marriage in Saudi society?
2. What are the social, cultural and economic factors leading to consanguinity marriage in Saudi society?
3. What is the relationship between consanguinity marriage and the transmission of genetic diseases (sickle cell anemia)?
4. What are the means that limit genetic diseases resulting from consanguinity marriage?

These questions involve two hypotheses that the research attempts to verify, namely:

- 1- There is a statistically significant relationship at the level of 0.05 between the high rate of consanguinity marriage and the demographic, social and economic factors of the sample in the eastern region.
- 2- There is a statistically significant relationship at the level of 0.05 between consanguinity marriage and the high rate of hereditary blood diseases (sickle cell anemia) in the eastern region.

Research Objectives:

The research aims to analyze the demographic, social and economic dimensions of consanguineous marriage and its relationship to some genetic diseases, especially sickle cell anemia, and its impact on Saudi society. A group of sub-goals branch out from the main objective, which are determined as follows:

1. Knowing the extent of the phenomenon of consanguineous marriage in Saudi society
2. Identifying the social, cultural and economic factors leading to consanguineous marriage in Saudi society.
3. Clarifying the relationship between consanguineous marriage and the transmission of genetic diseases (sickle cell anemia)
4. Arriving at appropriate ways to reduce genetic diseases resulting from consanguineous marriage in Saudi society.

Theoretical Framework-

- Consanguinity Marriage (Endogamy):

Endogamy is a marriage between two people who are related by blood. It is the marriage that takes place within the same family, such as the marriage of cousins and aunts, to extend within the same tribe, with the aim of strengthening family relations and protecting them from mixing with other lineages, as well as other matters related to inheritance. (Al-Obaidi, 2012)

Consanguineous marriage: is a deeply rooted social trend among one-fifth of the world population, mostly residing in the Middle East, West Asia, and North Africa, as well as among some immigrant communities in Europe and North America. (Al-Nabalawy, 2016)

It is also defined as a kind of desirable or prescribed practice for marriage within a kinship group, which may be a clan, tribe, village, or social class. (Marshall, 2000)

- Genetic diseases:

Genetic diseases are defined as “a group of diseases that are transmitted from parents to children, and the reason for their occurrence is a defect in the composition and components of red blood cells, which produce red blood cells that are unable to perform their normal functions, and one of the most important types of genetic blood diseases is Thalassaemia, and cell anemia. (NHS)

Genetics defines hereditary diseases as, “an incompatible group of diseases that appear in the form of health symptoms that are difficult to treat, and are transmitted from parents to children through genetic material, as a result of a genetic or chromosomal imbalance. (Haila, 1999)

- Sickle cell anemia:

Sickle cell anemia is one of the genetic blood diseases in which a disorder occurs in the genes responsible for the formation of hemoglobin, and it causes the adhesion of these pellets inside the tiny blood vessels, thus, the flow of blood and oxygen to the organ decreases, which results in symptoms associated with crises in people with sickle cell anemia, including severe pain, tightness breathing, and others. (Bittles, 2008)

- literature review:

Among these studies is the study of Al-Issa (2018), which dealt with the jurisprudential opinion on the provisions of infectious genetic diseases, and clarified the view of Islamic law and its implications.

Al-Hashemi's exploratory study (2018). This study was dedicated to detecting the perception of university youth towards consanguineous marriage, measuring their awareness of hereditary blood diseases.

The study of Al-Hussein (2019). The researcher relied on the experimental method, and applied the questionnaire to a group of Saudi families in the city of Riyadh.

The study of Saba (2016), attributed consanguineous marriage to economic factors, the provision of dowries and the lack of expenses, because of the intimacy of social and human relations between families. The study of Al-Nabawi (2016) in the Sultanate of Oman, monitored the most important social and cultural variables affecting the health status of Omani society, especially genetic blood diseases. Abu Dalo (2015), discussed genetic diseases resulting from consanguineous marriage in seven Jordanian villages.

Hawamdeh (2005), advocated the application of a permanent strategy in the short and long term to put the means into practice. And the study of Al-Shalawi (2005), which called for the establishment of control over the work of medical laboratories when conducting a complete blood test.

Although most of the previous studies dealt with many topics related to the problem of the current research, yet the current research adopted the descriptive analytical approach, as well as the difference in the temporal and spatial dimensions, social and cultural awareness, the research population, the sample, and the qualitative analysis unit adopted in the research. If the previous studies focused on a specific type of disability, this research is distinguished from other previous studies in that it is scientific research of hereditary blood diseases, specifically sickle cell anemia, that is spread in the Eastern Region of the Kingdom of Saudi Arabia. However, it can be said that the previous studies helped crystallize the way the information was organized, thus serving as a theoretical and methodological frame of reference. The research benefited from the literary survey in defining and constructing the research case, formulating its hypotheses, and determining the methods of data collection and analysis.

Sociological approaches of the Research:

There are some theoretical frameworks that provide scientific explanations in the context of dealing with the issue of the social and cultural dimensions of health and disease. This research started from a sociological conceptual framework based on the assumptions of Parsons' event theory mainly to guide the field research and define its field, and the research relied on the interpretation of the problem on the theory of heredity and its relationship to disease, and the theory of social class and disease.

- Parsons' event theory:

Parsons' theory has focused on the system and its application to consanguinity marriage. It means that the family is a social system in action, so it includes the systems of links and interaction that people establish with each other, as they can practice the act when they become able to practice it through consanguineous marriage, as they distribute the social functions that allow them to practice the act in a different way depending on the social location. The theory that Parsons worked to develop contributes to the clarification of many social issues, so this theory has become an important position in sociology studies in America, and in most countries of the world, the researcher was able to address many issues of sociology and social issues because of its analytical capabilities. (Al-Gharib, 2014)

- The theory of heredity and its relationship to disease:

Many scientific studies have proven that there are a large number of diseases that have the greatest impact on children from consanguineous marriage, for example, sickle cell

anemia, an increase in the rate of abortions among women married to the circle of relatives, an increase in the ratio of congenital diseases and physical disabilities, an increase in the ratio of women being subjected to cesarean section, troubles of pregnancy and childbirth, an increase in the ratio of intellectual disability and mental retardation, and weakness in the offspring as a result of the accumulation of bad genetic traits. An increase in the prevalence of phenylketonuria, which is a type of metabolic disease, results in a deficiency in an enzyme responsible for the breakdown of phenylalanine or the amino acid, so its rate increases: “Phenylketonuria is a rare inherited disorder that causes an amino acid called phenylalanine to build up in the body. PKU is caused by a change in the phenylalanine hydroxylase (PAH) gene. This gene helps create the enzyme needed to break down phenylalanine”. (Rush, Rohena: 2020)

- The theory of social class and disease:

For sociologists, the social class is determined by comprehensive and integrated social determinants. Social classes, in consanguinity marriage, are determined not only by quantitative determinants, although they are subject to a unified law, which is conflict and contradiction within the family. It is possible that there will be an agreement between families because of this marriage, and it is possible and even expected that there will be conflict within the family due to consanguinity marriage. Therefore, it does not follow a specific method and does not take a single form in the conflict. There are some conflicts within families because of the problems that occur between the spouses, but it did not take an overt form. This conflict is expressed socially by relatives. It is also possible that the conflict is hidden or did not appear between relatives. Consanguineous marriage has been linked to the development and progress of societies and is present in all societies and in Saudi society in particular. (Johnson, 2010)

Research Methodological Procedures:

As the study is a descriptive-analytical, the research relied on the social survey approach through the sample.

The SPSS statistical program was used to process the data contained in the questionnaire and calculate frequencies and ratios for the characteristics of the research population and population data. To verify the hypotheses of the research, the chi-square test was used at the level of statistical significance of 0.05.

The field study was applied on a purposive sample of (254) individuals from the Eastern Province community, to whom consanguineous marriage applies and who have genetic diseases (male and female), in 2023 . And the questionnaire was used as a data collection tool.

Data Collection tool:

The items of the questionnaire were built in a positive direction according to the five-point Likert scale. Weights were given to the items as follows: strongly agree: five degrees, agree, four degrees, hesitant: three degrees, disagree: 2 points, strongly disagree: 1 point.

The questionnaire consists of two parts: The first section: is primary data of the sample, and includes variables: gender, marital status, age group, educational level, family income, number of family members who have genetic diseases, type of individual who has genetic disease, type of genetic disease, and other characteristics that explain the features and nature of the sample. The second section: included the themes of the questionnaire, and consists of four axis related to the study questions.

a. The internal consistency validity and reliability analysis of the questionnaire:

The following table shows Cronbach's alpha coefficient, which measures the reliability of the research's tool. We find that Cronbach's Alpha values for each dimension of research are less than its total value, which is equal to 0.943, indicating the reliability of these questions.

Table No. (1) shows the correlation coefficient with the total score of the axis		
Axis	Validity	Cronbach's Alpha
the extent of the spread of the phenomenon of consanguineous marriage in Saudi society	0.963	0.928
the social, cultural and economic dimensions leading to consanguineous marriage	0.969	0.939
the relationship between consanguineous marriage and the transmission of genetic diseases (sickle cell anemia)	0.970	0.941
factors that limit genetic diseases resulting from consanguineous marriage	0.960	0.922
Total	0.971	0.943

It is clear from table (1) that the values of the correlation coefficients between the degree of the dimension and the total degree of the axis to which the dimension belongs are high ranging between (0.960) and (0.971) and all of them are positive and statistically significant, which means that there is a high degree of internal consistency, which reflects a high degree of validity of the questionnaire items.

Results and discussion

First Section - The primary data and properties of the sample:

Table No. (2)			
Statistic of the research sample by :			
	Variant items	Frequency	Percent
Gender	male	26	10.2
	female	228	89.8
	Total	254	100
age group	20 – 25	70	27.6
	26- 30	49	19.3
	31 – 35	28	11.0
	36 – 40	40	15.7
	45 – 50	35	13.8
	50 -70	32	12.6
	Total	254	100.0
educational level	elementary	1	.4

	preparatory	9	3.5
	secondary	69	27.2
	university	168	66.1
	post university	7	2.8
	Total	254	100.0
social status	married	215	84.6
	single	31	12.2
	divorced	7	2.8
	widow	1	.4
	Total	254	100.0
Family income	0-3000	16	6.3
	3001 - 6000	45	17.7
	6001-9000	56	22.0
	9001-12000	47	18.5
	12001-15000	28	11.0
	15001-18000	23	9.1
	18001-21000	18	7.1
	21000-35000	21	8.3
	Total	254	100.0
number of family members who have genetic diseases	one	113	44.5
	two	52	20.5
	three	27	10.6
	four	14	5.5
	five	30	11.8
	six	18	7.1
	Total	254	100.0
individual gender who has a genetic disease	male	56	22.0
	female	49	19.3
	none	149	58.7
	Total	254	100.0
	kinetic	1	.4
	audio	33	13.0
	pronunciation	7	2.8

type of genetic disease	vitaligo	1	.4
	Retardation	7	2.8
	blood diseases (thalassemia)	15	5.9
	Blood diseases (anemia or sickle cell anemia)	49	19.3
	Congenital malformations (hare lip, cleft palate)	4	1.6
	knock down	2	.8
	none	135	53.1
	Total	254	100.0

- The data of table No. (2) show that the ratio of females is higher than that of males, as females represent 89.8%, while males represent the lowest ratio, 10.2%.
- The results indicate that the interest of individuals in the issue of consanguineous marriage increases in the age group (20-25) by 27.6%, and it decreases among individuals (31-35) to a rate of 11%.
- The data shows the majority of individuals by educational status from university at 66.1%, secondary at 27.2%, average at 3.5%, and higher education at 2.8%
- The data shows that the highest ratio of married people is 84.6%, followed by bachelors at 12.2%, discovered at 2.8%, and widows at 0.4%.
- The data shows show that the majority of those with incomes between 6001-9000 at a rate of 22%, followed by those with incomes between 9001-12000 at a rate of 18.5%, then those with incomes between 3001-6000 at a rate of 17.7%, then those with incomes less than 3000 at a rate 16%, then those with income between 21001-15000 at a rate of 11%, then those with income between 15001-18000 at a rate of 9.1%, then those with income more than 21,000 at a rate of 8.3%, then those with income between 18001-2100 at a rate of 7.1%
- The data shows that the vast majority do not have a family member with a hereditary disease at a rate of 44.5%, followed by one individual at a rate of 20.5%, then followed by more than four individuals at a rate of 11.8%, then followed by two individuals at a rate of 10.6%, then followed by four individuals at a rate of 7.1%, then followed by three individuals at 5.5%.
- The table shows that the highest ratio of the sample does not have a genetic disease with a rate of 58.7%, followed by males with a ratio of 22%, while females with a ratio of 19.3%
- The table indicates that the majority of the sample does not have a genetic disease by 53.9%, then blood diseases (anemia or sickle cell anemia) by 22.8%, then other classified types by 16.1%, then blood diseases (Thalassemia) by 5%, then Speech rate by 3.1%, then mental retardation by 2.4%, then epilepsy by 2%, then movement by 2%, then congenital deformities by 1.6%, then hearing by 1.2%, then vitiligo by 1.2%.
- Most families prefer consanguineous marriage by 60.2%, while families who do not prefer consanguineous marriage by 39.8%
- Consanguineous marriage increases in families of one tribe by 93.3% and decreases in the other by 6.7%.

Results of the second axis: the extent of the spread of the phenomenon of consanguineous marriage in Saudi society:

1 The results show that the majority (72.8%) are married to one of their relatives, while 27.2% are not married to one of their relatives.

2 The results show that the highest ratio has a family member who is married to relatives (87.4%) and those who are not married to relatives (12.6%).

3 The results that the highest ratio does not support consanguineous marriage by 56.3%, and the lowest ratio supports consanguineous marriage by 43.7%.

4 The results indicate that the highest ratio favors consanguineous marriage by 60.2%, while the lowest ratio, 39.8%, does not favor consanguineous marriage.

5 The results indicate that the highest ratio of those in whose social milieu has a high incidence of consanguineous marriage is 77.2%, and the lowest ratio of whom consanguineous marriage is not frequent is 22.8%.

6 The results indicate that the vast majority have families in their residential area who accept consanguineous marriage at a rate of 78.7%, and the ratio that does not have many families in their residential area who accept consanguineous marriage represents 21.3%

7 The results indicate that the highest ratio of the sample resides in an urban area at a rate of 94.1%, and those who do not reside in an urban area represent a rate of 5.9%

8 The results indicate that consanguineous marriage is the ideal model in Saudi society at a rate of 51.2%, while the lowest ratio, is 48.8%, in which consanguineous marriage is not considered the ideal model in Saudi society.

9 The results indicate that consanguineous marriages are common among families of the same tribe, with a rate of 93.3%, while the lowest ratio of them do not have consanguineous marriages, with a rate of 6.7%.

10 Most of those who are married to consanguineous marriages live in urban environments (94.1%), while people who live in rural areas account for 5.9%.

11 Most of the community's population believes that consanguineous marriage is the ideal model with a ratio of 51.2%, while others oppose this view with a ratio of 48.8%.

Table No. (3) Second: Results associated with social, cultural and economic factors leading to consanguineous marriage

Axis 2	Phrase		Strongly agreed	agreed	hesitant	disagree	strongly disagree	Total	Std. Deviation	Mean
Results associated with social, cultural and economic factors leading to consanguineous marriage	Saudi society encourages consanguineous marriage	F	42	66	95	53	4	254	1.04088	2.6457
		%	15.4	24.6	35,8	20,5	1,6	100		
	Strengthening family ties	F	52	98	66	34	5	254	1.01005	2.3543
		%	20.3	38.6	26,0	13,0	1,6	100		

Parent pressure	F	42	68	74	70	8	254	1.10899	2.7205
	%	15.7	26	27,6	25,2	4.2	100		
consanguineous marriage achieves family stability and harmony	F	25	57	99	61	17	254	1.05747	2.9094
	%	9.8	22	37,0	23,6	5,5	100		
Fewer marital problems	F	20	42	85	85	25	254	1.08948	3.1850
	%	9.7	16.1	32,7	32,7	9,4	100		
Transmission of positive genetic traits such as beauty, intelligence, strength or longevity, and others	F	28	74	83	55	18	254	1.09685	2.8268
	%	10.6	28.3	31,5	21,3	10,6	100		
consanguineous marriage is associated with customs and traditions	F	66	118	38	29	5	254	1.00405	2.1654
	%	25.6	46.1	14,6	11,4	1,6	100		
Preserving the assets and principles within the family.	F	40	116	60	38	5	254	.99325	2.4134
	%	15.4	44.1	23,2	13,8	1,6	100		
Maintaining the cohesion of one clan	F	41	99	66	44	7	254	1.04723	2.5118
	%	15,4	17,73 8,2	25,2	17,3	2,8	100		

Preserving the property, money and wealth of the family	F	46	88	58	51	17	254	1.16507	2.5906
	%	17,7	33.9	20.9	19,7	5,5	100		
Material burdens of dowry and marriage requirements	F	46	80	62	51	16	254	1.18307	2.6457
	%	17,7	31.1	24,4	20,1	6,3	100		

- Society believes that consanguineous marriage is related to customs and traditions, with a ratio of 25.6% to 46.1% in support and 13% in opposition.
- Society believes that consanguineous marriage achieves family stability and harmony, with a ratio of 9.8% to 22% in support, while 5.5% to 23.6% oppose.
- Most people support the marriage of relatives to reduce financial burdens such as dowry and other costs with a ratio of 17.7% , and Mean 1.18307
- The results indicate that the Strengthening family ties 20.3%
- The results indicate that the Preserving the property, money and wealth of the family 17.7%
- The results indicate that the Material burdens of dowry and marriage requirements 17.7%
- The results indicate that the Parent pressure 15.4%
- The results indicate that the Saudi society encourages consanguineous marriage 15.4%

Third: Results related to the relationship between consanguineous marriage and transmission of genetic diseases (sickle cell anemia)

- The results indicate that the number of families who have more than 4 individuals who carry a genetic disease is 44.5%, while families with one person is 20.5%, and families that do not have a genetic disease are 11.8%.
- The results indicate that the ratio of males infected with genetic diseases is higher than that of females, as the ratio of males reaches 22%, while females reach 19.3%.
- The results indicate that genetic blood diseases have the highest prevalence, with a rate of 22.8%.
- Direct kinship is the highest in consanguineous marriage with a rate of 60.6%, followed by an indirect relative, with a rate of 11.4%.
- The results indicate that the phrase: "anemia or sickle cell anemia are genetic diseases" has achieved the highest ratio which amounted to 44.9%, and this is evidence that anemia or sickle cell anemia is a genetic disease.
- The phrase: "there is complete recovery from hereditary blood diseases" achieved the lowest ratio, which amounted to 3.5%, and this is evidence that the ratio of recovery from genetic diseases is incomplete.

- Genetic blood diseases have the highest prevalence, with a rate of 22.8%.

- Verification of the first hypothesis:

Table No. (4) indicates, using the (x²) test, that the chi-square value of the probability is Asymp. Sig. equal to 0.000, which is less than the 0.05 level of statistical significance. This means that there is a very strong relationship between the demographic, social, and economic factors of the study sample and consanguineous marriage. This confirms the hypothesis of the first study that there is a statistically significant relationship of 0.05 between the high rate of consanguinity marriage and the demographic, social and economic factors of the sample in the eastern region.

Table No. (4) -Chi-Square Tests

Your family prefers consanguinity marriage * Strengthening family ties	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.667 ^a	4	.000
Likelihood Ratio	30.971	4	.000
Linear-by-Linear Association	23.063	1	.000
N of Valid Cases	254		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.59.

- Verification of the second hypothesis:

Table No. (5) -Chi-Square Tests

Your family prefers consanguinity marriage * Preserving the assets and principles within the family	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.346 ^a	4	.006
Likelihood Ratio	12.357	4	.002
Linear-by-Linear Association	9.377	1	.001
N of Valid Cases	254		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.99.

Table No. (5) indicates, using the (x²) test, that the chi-square value of the probability is Asymp. Sig. equal to 0.006, which is less than the 0.05 level of statistical significance. This means that there is a very strong relationship between consanguineous marriage and the high rate of hereditary blood diseases (sickle cell anemia) in the eastern region.

Research Recommendations:

1. Activating the role of the university in educating students about the possibility of an increase in the incidence of genetic diseases among members of society as a result of consanguineous marriage, and the negative consequences incurred by the individual and society.
2. Include the impact of genetic diseases on society and the individual in school and university curricula, and in awareness and social lectures.

3. University students should be encouraged to conduct early premarital examinations and genetic counseling, and the importance of taking into account the results of the examination should be emphasized.
4. Create a database for people with genetic diseases to investigate their spread and work with various institutions to limit their spread.
5. Implementing a preventive awareness-raising medical program targeting students from high school to university, including compulsory examination for students to identify the number of infected and carriers of genetic diseases, and guiding them to the right choice of life partner.
6. Creating an effective mechanism between the Ministry of Health and the Ministry of Social Development to activate the role of social specialists in carrying out their role in following the scientific method to research the phenomenon of consanguineous marriage and its relationship to the spread of genetic diseases in Saudi society, and to provide scientific solutions that could limit the consequences of this problem.
7. Conducting more scientific research related to consanguineous marriage and its relationship to hereditary diseases in Saudi society, and taking into account the results of studies and research to encourage members of society with the importance of mandatory premarital examination.
8. Focusing the media on spreading medical culture, especially those related to marital life and offspring, and showing the seriousness of genetic diseases through doctors discussing this issue.
9. Issuing new laws to conduct premarital medical examinations that include all infectious and non-communicable genetic diseases.
10. Emphasizing the effective and constructive role of the religious institution in raising the level of awareness among the community through sermons and lessons.

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