

Perception of Premarital Screening and Genetic Counseling among Future Couples

E. M. Hamed¹, D. KH. Eshra², I. K. Ali³, A. KH. Khalil⁴

¹ Nursing specialist in the Neurosurgery Hospital, Faculty of Nursing, Menoufia University

² & ³ Professor at Maternal and Newborn Health Nursing, Faculty of Nursing, Menoufia University

⁴ Assistant Professor at Maternal and Newborn Health Nursing, Faculty of Nursing, Menoufia University

Corresponding email: ekrammahfouz8@gmail.com.

Abstract

Background: Premarital screening and genetic counseling are important plans and strategies for preventing genetic disorders and congenital anomalies. The nurse has an integral role in providing genetic services that include assessing genetic risk, providing information, discussing available testing options and providing appropriate supportive counseling. **Aim:** To evaluate the perception of premarital screening and genetic counseling among future couples. **Design:** A descriptive cross-sectional design was utilized. **Setting:** The present study was conducted in the Maternal and Child Health center in Shebin El-Kom city. **Sample:** A convenience sample of three hundred and sixty future couples was used. **Instruments:** **Instrument I:** a structured interviewing questionnaire and **Instrument II:** attitude of the studied future couples regarding premarital screening and genetic counseling. **Results:** The results of the present study revealed that: Approximately three-quarters of the studied future couples (73.3%) had heard about PMSGC, but approximately two-thirds of the studied future couples (69.40%) had inadequate knowledge about premarital screening and genetic counseling. More than one-half of the studied future couples (50.80%) had a positive perception of premarital screening and genetic counseling. There was a highly statistically significant difference between the total perception of the studied future couples regarding premarital screening and genetic counseling and their demographic characteristic. **Conclusion:** More than one-half of the studied future couples had a positive perception of premarital screening and genetic counseling. Also, there were highly statistical differences among the total perception of the studied future couples regarding premarital screening and genetic counseling and their demographic characteristics. **Recommendations:** Increasing knowledge of the community regarding premarital screening and genetic counseling in collaboration with adequate religious support and government policy is recommended. Studying the effect of education programs regarding premarital screening and genetic counseling on university students' knowledge, perception, and attitude is essential.

Keywords: Perception of future couples, premarital screening, genetic counseling.

Introduction

Premarital screening and genetic counseling programs are unique strategies for health prevention and promotion of specific genetic disorders and sexually transmitted diseases. It is offered to couples intend to get married to reduce the incidence of genetic disorders and sexually transmitted diseases to children (Al-Shafai et al., 2022).

In addition to the premarital screening and genetic counseling program reduce the incidence of genetic disorders and sexually transmitted diseases. It is also considered a vital step toward allowing people to enjoy life and

protecting the society, hence minimizing the burden on persons, families and community and increasing knowledge of the community about genetic disorders (Routh Al-Deen, 2021).

Genetic counseling is the process by which an individual or family provides advice or gets information about genetic disorders that may affect them at risk for genetic disorders so that they can make appropriate decisions about marriage, reproduction, health and adaptation to their medical conditions and psychological conditions and familial effects associated with genetic disorders. Genetic counseling protects the couple's independence and fulfills their right to have complete information about the disorder and all valuable options (Raingruber, 2016).

PMS has been implemented in several countries worldwide, it was mandated in other countries, and especially those with high consanguinity rate such as countries in the Middle East the disease screened as part of PMS vary across countries. For example, in Saudi Arabia, it is mandatory for sickle cell disease, thalassemia, HIV, and hepatitis B and C. In Egypt, PMS is mandatory only to conduct hemoglobinopathy screening (Alhosain, 2018).

Batey, (2016) defined perception as the organization, identification, and interpretation of sensory information in order to represent and understand the environment or is the awareness of elements interpreted in the light of experience.

Factors are attributes that have an influence on individual and how the individual perceives the environment, socio-demographic characteristics, structural facilities of setting, care provider's technical competence, access to health facilities, health personal professional knowledge and skills, past experience their good interpersonal relationship with the client and their satisfaction all influence on the perception of maternal health care (Eshetu, 2015).

The World Health Organization recommended several measures to prevent genetic diseases including health education, the improvement of community knowledge, attitude toward the control of hereditary genetic diseases, premarital screening and genetic counseling, prenatal diagnosis, and preconception diagnosis (Alghamdi et al., 2016).

The health care professionals are logical choices for conveying valid information about pre-marital screening and genetic counseling. The Nurse has an integral role in providing genetic services, utilizing a variety of communication and information gathering techniques to gather the information that includes assessing genetic risk, providing information, discussing available testing options and providing appropriate supportive counseling (Ali et al., 2018).

Significance of the study:

Genetic blood disorders are widespread in Arab countries and consider the main causes of infant and child death, morbidity, and disability (Howard, 2020). Ali et al., (2018) reported hereditary hematological diseases, especially sickle cell anemia (SCA), and thalassemia make up one of the most common groups of genetic disorders globally. He added that 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.

Yousifa et al., (2018) and Awoyeni, (2015) mentioned that, in Egypt hereditary disorders and congenital malformation is estimated that 2.8% of them live in urban areas and 8.4% of them live in rural, this is almost attributable to consanguineous marriage. **El-Gilany et al., (2017)** reported that consanguineous marriage is one of the most important issues discussed by premarital counseling. It is marriages between blood relatives or marriages between second cousins or closer. In Egypt, The incidence of consanguineous marriage in the general population was found to be 27.4%. The highest incidence was in the rural areas. First cousin marriages occurred more often than the other types of consanguinity.

According to the review of literature **Ali et al., (2018)** who studied perception about premarital screening and genetic counseling among males and females nursing students reported that the participants' attitude toward premarital screening and genetic counseling was positive but insufficient awareness concerning those diseases it focuses and targets. Also the vast majority of them agreed to perform PMSGC and their attitude regarding premarital screening and genetic counseling found to be affected by their gender, personal and family history of hereditary diseases.

Yousifa et al., (2018) who studied perception and satisfaction of premarital screening and genetic counseling among future couples of governmental outpatient clinics showed that future couples' total knowledge about the PMSGC program is inadequate but their attitude regarding premarital counseling and examination was positive attitude. Also, their knowledge was found to be affected by socio-demographic data (education, age, residence-&income).

However, PMSGC services are very limited and most of the couples get married without any preparations which may increase the maternal and fetal risks. For this reason this study will be conducted to evaluate the perception of premarital screening and genetic counseling among future couples.

Purpose of the Study:

Evaluate perception of premarital screening and genetic counseling among future couples.

Research questions:

- What is the perception of premarital screening and genetic counseling among future couples?
- Is there a relationship between perception of premarital screening and genetic counseling among future couples and their Sociodemographic characteristics?

Research Design:

A descriptive cross -sectional design was used to carry out the present study.

Research Settings:

The present study was conducted in the Maternal and Child Health (MCH) center (Qebly) in Shebin El-Kom city at Menoufia Governorate. There is a high flow rate of future couples attending these centers from the different surrounding cities and villages that are near to Shebin El- Kom city. The flow rate of future couples is 3400 yearly at Qebly Maternal and Child Health center. This center provides

services to the community including; future couple screening, obtaining a marriage certificate, maternal and child health services, antenatal, natal, postnatal care, vaccination during pregnancy and family planning services.

Sampling:

A convenience sample of three hundred and sixty future couples from MCH center (Qebly) who fulfilled the following criteria: Both genders: Male and female planned to get married.

Sample size:

The flow rate of future couples is 3400 yearly at Qebly Maternal and Child Health center. Based on past review of literature (Ali et al., 2018) who reported that 78.3% of the studied participants were perceptive about the premarital screening availability, sample size has been calculated using the following equation: $n = (z^2 \times p \times q) / D^2$ at 80% power and CI 95% and it will be 360 participants.

Instruments

Instrument I: A structured interviewing Questionnaire

This instrument was used by the researcher to obtain complete data concerning premarital screening and genetic counseling. This instrument was consisted of three parts:

Part (I): Demographic characteristics of the studied future couples as age, gender, education, residence, occupation, income, relative relationship, parental consanguinity, personal history of hereditary disease and family history of hereditary disease.

Part (II): Level of knowledge of the studied future couples regarding premarital screening and genetic counseling. This part was developed by the researcher and revised by 3 experts through checking validity measure to assess level of knowledge of the studied future couples regarding premarital screening and genetic counseling e.g. hearing before regarding premarital screening and genetic counseling, sources of knowledge about premarital

screening (PMSGC) , know the meaning of PMSGC, know objectives of PMSGC, know infectious diseases that are focused on PMSGC, know hereditary diseases that are focused on PMSGC, know different options of places performing PMSGC, know tests that are involved in PMSGC services, know what physical examination is involved in PMSGC services.

Scoring system:

The total knowledge score included (9) closed ended questions. Each correct answer scored (0) and incorrect answer scored (1). The total score was indicating in three categories as the following: adequate >70% of total knowledge score, moderate: 70% - > 50% of total knowledge score and inadequate if the present study score was less than 50% (Al-Shroby et al., 2021; Babu et al., Binshihon et al., 2018 ; Ibrahim et al., 2013).

Validity of the instrument

The validity of the instrument was ascertained by three experts (two experts in Maternal and Newborn Health Nursing and one expert in Obstetrics & Gynecology) who judged the instrument for content and internal validity and modifications done.

Reliability of the instrument

Test-retest reliability had been used by the researcher for testing the internal consistency of the instrument. It was done through the administration of the same instrument to the same participants under similar conditions. Scores from repeated testing were compared and some questions were modified

Part (III): Perception of the studied future couples regarding premarital screening and genetic counseling. This part was developed by the researcher and revised by three experts' specialists in Maternal and Newborn Health through checking validity measures to assess perception of the future couples regarding premarital screening and genetic counseling.

It includes e.g. Is it important for future couple?, raise awareness about PMSGC before marriage, will reduce the prevalence of some genetic disease and the prevalence of some sexual transmitted diseases. Consanguinity can increase the risk of hereditary disease, PMSGC should be confidential, also cause psychological trouble to the couples, religious people should adopt the ideas of PMSGC in their discussion, law should obligate all future couples to do PMSGC is important, marriage decision must be left for freedom of the couple, medical counseling is important to be given after getting the results, any disease appeared in one of the couple has to be treated before marriage.

Scoring system:

Questions regarding perception of premarital screening and genetic counseling included 12 questions, The rate of scoring was from 1-5 that indicates 5-Likert scale used after modifications by researcher and revised by 3 experts through checking validity measures, each question answer ranged from strongly disagree (1), disagree (2), neutral (3), agree (4) strongly agree (5). The total perception score was indicated as the following: Positive perception: > 75% of total perception score, Neutral perception: 50-75% and negative perception if the percent score was less than 50% (Al-Shroby et al., 2021; Yousifa, 2018; Ali et al., 2018; Ibrahim et al., 2013).

Validity of the instrument:

The validity of the instrument was ascertained by three experts (two experts in Maternal and Newborn Health Nursing and one expert in Obstetrics & Gynecology) who judged the instrument for content and internal validity and modifications were made.

Reliability of the instrument

Test-retest reliability was applied by the researcher for testing the internal consistency of the instrument. It was done through the administration of the same instrument to the same participants under similar conditions on two or more occasions. Scores from repeated

testing were compared and some questions were modified.

Instrument II: Attitude of the studied future couples regarding premarital screening and genetic counseling. This instrument was developed by the researcher and revised by expert through reliability and validity measures to assess attitude of future couples regarding premarital screening and genetic counseling e.g. agree to carry out premarital screening and genetic counseling, prefer relative marriage, advice future couples to conduct PMCGS, appropriate time of carrying out PMSGC is just before marriage.

Scoring system:

Questions regarding attitude of the future couples regarding premarital screening and genetic counseling were scored as the following each question answer ranged from disagree (1), uncertain (2) to agree (3). The range of scores was from 1-3 that indicates Likert scale used after modification by researcher. The total score of attitude was indicated as the following: Positive attitude: > 75% of total attitude score, Neutral attitude: 50-75% of total attitude score and negative attitude if present score was less than 50% (Ibrahim et al., 2013; Al-Shroby et al., 2021; Binshihon et al., 2018; Al Kendi, 2012).

Validity of instrument:

The questionnaire was based on close-ended questions. The designed questionnaire was content validated by expert's reviews in a pilot study. The questionnaire was also translated into Arabic and reviewed by language experts.

Reliability of instrument:

Pre-Testing of the instrument: The validated instrument was subjected to a pretest using (36) participants from MCH center. This enabled the researcher to test run the instrument in order to be acquainted with the procedures and the probable constraints the study would be faced with.

Administrative Approval:

An approval from the Committee of Hearing and Ethics Faculty of Nursing, Menoufia University was obtained on 8/5/2020. Official letters were taken from the Dean, Faculty of Nursing, Menoufia University, and were submitted to the directors of the Maternal and Child Health (MCH) center (Qebly) in Shebin El-Kom city at Menoufia Governorate to carry out the study. Official permission was obtained to carry out the study from the directors of the above-mentioned settings.

Ethical Considerations:

A written permission was obtained from the Dean of Faculty of Nursing, Menoufia University for the directors of the Maternal and Child Health center in Shebin El-Kom City.

Approaches to ensure ethics were considered in the study regarding confidentiality and informed consent. Confidentiality was achieved by the use of locked sheets with the names of the future couple replaced by code numbers. All future couples were informed that the information they provided during the study would be kept confidential and used only for statistical purposes after finishing the study. The findings would be presented as a group data with no personal participant's information remaining.

After explanation prior to enrollment in the study, informed verbal consent was obtained from all future couples. Each couple was informed that participation in the study was voluntary, and that they could withdraw from the study whenever they decided to and each one was given the opportunity to freely refuse participation. They were free to ask any question about the study details.

Pilot study:

Pilot study was conducted to test the applicability of the instrument, the feasibility of the study and to estimate the time needed for data collection on 10% of the total sample (36) participants. On the basis of the pilot study results; the researcher rephrased some questions. Hence, the future couples who were chosen in pilot study were not included in the study sample.

Procedure:-

The current study was carried out in two consecutive phases, namely preparatory and implementation phases.

1.The preparatory phase:

An extensive literature review related to the study was done including electronic dissertations, available books, articles, doctoral dissertation, research and peer interaction, and ideas from external sources and periodicals. An official permission was granted from the Maternal and Child health center authorities before starting data collection. The researcher's plan explains the procedures for describing the purpose of the study to the participants.

2.Implementation phase:

The researcher applied the implementation phase according to the following steps:

At the beginning, the researcher went to the Maternal and Child Health center in Qebli every day except Friday from 9 Am to 1.30 Pm. About 5 to15 future couples came to the center to obtain health certificate for marriage but only 5-7 future couples agreed to participate in the study and each couple took about 10 to 15 minutes to answer the questionnaire.

The 1st step: The researcher met the future couples in MCH centers at the time of doing medical tests in laboratory, as they were waiting for the results of the tests to appear or waiting for their turn to get the tests done, the researcher introduced herself to the studied future couples. The researcher provided a verbal explanation of the aim of the study and answered all related questions. They were interviewed to complete the demographic data, personal history of hereditary disease and family history of hereditary disease.

The 2nd step: The researcher used the questionnaire to assess level of knowledge of the future couples regarding premarital screening and genetic counseling e.g. hearing before about premarital screening and genetic counseling, sources of knowledge about premarital screening (PMSGC), know the meaning of PMSGC, know objectives of PMSGC, then ask about their perception about premarital screening and genetic counseling e.g. premarital screening and genetic counseling is important for future couple, PMSGC will reduce the prevalence of some genetic disease

and consanguinity can increase the risk of hereditary diseases.

lastly ask about their attitude regarding premarital screening and genetic counseling e.g. agree to carry out the premarital screening and genetic counseling, prefer relative marriage, advise future couple to conduct PMCGS, appropriate time of carrying out PMSGC is just before marriage. The researcher filled the questionnaire forms from participants within ten to fifteen minutes. Also, each participant was thanked for their participation and their time.

The data collection started in July 2021 till September 2021.

Statistical Analysis:

Data were collected, tabulated and statistically analyzed by an IBM compatible personal computer with SPSS Statistical Package Version 22. Two types of statistics were used, descriptive statistics e.g., number (No) and percent (%). Analytic statistics e.g. Chi- squared test (χ^2) was used to study association between two qualitative variables.

Pearson correlation coefficient test (r-test) is used to study the correlation between two parametric quantitative variables. Spearman correlation coefficient test (r-test) is used to study the correlation between variables when one of them is an ordinal variable. P-value of (≤ 0.05) was considered statistically significant. P-value of (≤ 0.001) was considered high statistically significant (Bajwa, 2015).

Results

Table (1) shows demographic characteristics of the studied future couples. The majority of the studied group future couples (80, 9%) were aged less than 30 years. More than half of future couples (67.5%) live in rural areas. Approximately half of the studied future couples (50.9%) were females and (49.4%) were males. One-third of future couples (39.2 %) had secondary education and nearly half of participants (48.9%) had university education or higher.

It also shows that approximately three-quarters of the future couples (76.1%) weren't parental consanguinity. The majority of future couples (97.8%, 47.8%) didn't have a personal history and family history of hereditary disease respectively.

Table (2) Reveals knowledge of the studied future couples regarding premarital screening and genetic counseling. Approximately three-quarters of the future couples (73.3%) heard about PMSGC. More than one- half of future couples did not know the meaning and the objectives of PMSGC (59.4%, 59.7%) respectively. The majority of the future couples didn't know about infectious diseases, a hereditary disease that focused on PMSGC, different options of places performing PMSGC, tests that are involved in PMSGC services, and physical examinations are involved in PMSGC services (85.3%, 78.1%, 87.5%, 80.3%, 87.2%) respectively

Figure (1) illustrates the source of knowledge regarding PMSGC. Friends and family were the source's source of knowledge about premarital screening and genetic counseling for 46.90% of future couples followed by the internet (21.40%).

Figure (2) demonstrates the total knowledge score of the studied future couples about premarital screening and genetic counseling. Only (30.60%) had adequate knowledge about premarital screening and genetic counseling.

Table (3) indicates perception of the studied future couples regarding premarital screening and genetic counseling. The studied future couples perceive that PMSGC is important for future couples, it is important to increase awareness about PMSGC before marriage, PMSGC will reduce the prevalence of some genetic diseases, PMSGC will reduce the prevalence of some sexually transmitted diseases, consanguinity can increase the risk of hereditary diseases, religious people should adopt the ideas of PMSGC in their discussion and marriage decision must be left for freedom of the couple in detecting STDs (76.1%, 77.3%, 66.4%, 60.1%, 70.5%, 67.3%, 71.2%) respectively.

It also reveals that half (50.3%) of studied future couples perceive that PMSGC should be confidential, (40.6%) didn't perceive that PMSGC cause psychological trouble to the couples, more than half (58.1%) of future couples perceive that law should obligate all future couples to do PMSGC is important, (68 %) of future couples perceive that any disease appeared in one of the couples had to be treated before marriage and majority (83.9%) of future couples perceive that medical counseling is important to be given after getting the results.

Figure (3) explains the total perception score of the studied future couples regarding premarital screening and genetic counseling. More than half (50.80%) of the studied future couples had a positive

perception regarding premarital screening and genetic counseling.

Table (4) represents attitudes of future couples regarding premarital screening and genetic counseling. Approximately three-quarter of the studied future couples (70%) agree to carry out premarital screening and genetic counseling. Three-quarters of the studied future couples (75%) don't prefer relative marriage. The majority of the studied future couples (83.9%) advice future couples to conduct PMSGC. Approximately three-quarters of the studied future couples (72.2%) agree that the appropriate time for carrying out premarital screening and genetic counseling is just before marriage.

Figure (4) reveals the total attitude score of the studied future couples about premarital screening and genetic counseling. Approximately two-third (68.30%) of the studied future couples had a positive attitude toward premarital screening and genetic counseling.

Table (5) clarifies the relationship between total knowledge score of the studied future couples and their demographic characteristics regarding premarital screening and genetic counseling. There was a statistically significant difference between the total knowledge score of the studied future couples and their personal history of hereditary disease and their income (P 0.018, P 0.029) respectively.

It also shows that there was a highly statistically significant difference between the total knowledge score of future couples and their education (P <0.001). **Table (6)** describes the relationship between total perception score of the studied future couples and their demographic characteristics regarding premarital screening and genetic counseling. There was a statistical significant difference between the total perception of studied future couples regarding premarital screening and genetic counseling and their residence, income and educational level.

Table (5) clarifies the correlation between the total knowledge score, the total attitude score and the total perception score of studied future couples regarding premarital screening. There was positive correlation between the total knowledge score, the total attitude score and the total perception score of studied future couples regarding premarital screening. It also shows that there a highly statistically significant difference between the total knowledge score, the total attitude score and the total perception score of studied future couples regarding premarital screening

Table (1): Demographic Characteristics of the Studied Future Couples (N=360).

Variables	Studied future couples No.=360	
	No.	%
Age:		
- <30 years	290	80.6%
- 30 ≥years	70	19.4%
Gender:		
- Male	178	49.4%
- Female	182	50.6%
Residence:		
- Rural	243	67.5%
- Urban	117	32.5%
Education:		
- Illiterate	13	3.6%
- read and write	30	8.3%
- secondary education	141	39.2%
- Institute	63	17.5%
- University	106	29.5%
- post graduate	7	1.9%
Income:		
- Enough	163	45.27%
- Not enough	197	54.73%
Parental consanguinity:		
- Yes	86	23.9%
- No	274	76.1%
Personal history of hereditary disease:		
- Yes	8	2.2%
- No	352	97.8%
Family history of hereditary disease :		
- Yes	44	12.2%
- No	316	87.8%

Table (2): Level of Knowledge of the Studied Future Couples regarding Premarital Screening and Genetic Counseling (N=360).

Variables	The studied future couples			
	Correct		Incorrect	
	No.	%	No.	%
- Hearing before about premarital screening and genetic counseling	264	73.3%	96	26.7%
- know the meaning of PMSGC	146	40.6%	214	59.4%
- know objectives of PMSGC	145	40.3%	215	59.7%
- know infectious diseases that are focused by PMSGC	53	14.7%	307	85.3%
- know hereditary diseases that are focused by PMSGC	79	21.9%	281	78.1%
- know different options of places performing PMSGC	45	12.5%	315	87.5%
- know tests that are involved in PMSGC services	71	19.7%	289	80.3%
- know that physical examination is involved in PMSGC services	46	12.8%	314	87.2%

Figure 1: Sources of Information of the Future Couples about Premarital Screening and Genetic Counseling (N=360).

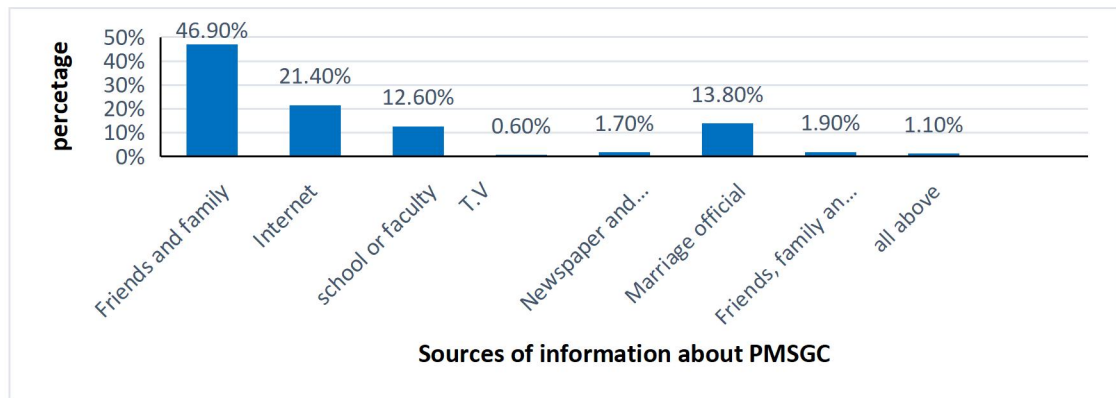


Figure (2): Total Knowledge Score of Studied Future Couples regarding Premarital Screening and Genetic Counseling (N= 360).

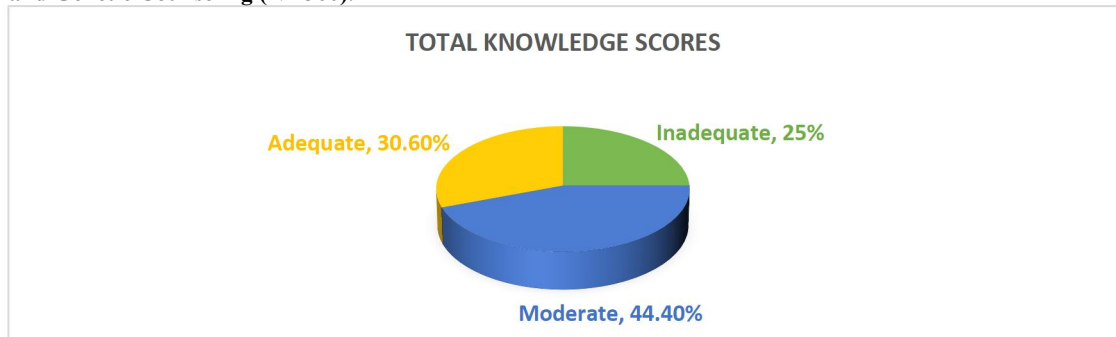


Table (3): Perception of the Studied Future Couples regarding Premarital Screening and Genetic Counseling (N=360).

Variables	The studied future couples									
	Strongly agree		Agree		Neutral		Strongly Disagree		Disagree	
	No.	%	No.	%	No.	%	No.	%	No.	%
- PMSGC is important for future couple	127	35.3%	147	40.8%	83	23.1%	3	0.8%	-	-
-Awareness about PMSGC before marriage	128	35.6%	150	41.7%	73	20.3%	9	2.5%	-	-
-PMSGC will reduce the prevalence of some genetic diseases	96	26.7%	143	39.7%	99	27.5%	22	6.1%	-	-
- PMSGC will reduce the prevalence of some sexual transmitted diseases	83	23.1%	131	36.4%	122	33.9%	22	6.1%	2	0.6%
-Consanguinity can increase the risk of hereditary diseases	111	30.8%	133	36.9%	89	24.7%	19	5.3%	8	2.2%
-PMSGC should be confidential	73	20.3%	126	35%	113	31.4%	44	12.2%	4	1.1%
-PMSGC cause psychological troubles to the couples	19	5.3%	57	15.8%	138	38.3%	127	35.3%	19	5.3%
-That religious people should adopt the ideas of PMSGC in their discussion	56	15.6%	186	51.7%	96	26.7%	19	5.3%	3	0.8%
-Law should obligate all future couples to do PMSGC is important	65	18.1%	144	40%	111	30.8%	37	10.3%	3	0.8%
-In detecting STDs, marriage decision must be left for freedom of the couple	74	20.6%	182	50.6%	89	24.7%	13	3.6%	2	0.6%
-That medical counseling is important to be given after getting the results	80	22.2%	222	61.7	55	15.3%	3	0.8%	-	-
-Any disease appeared in one of the couple has to be treated before marriage	76	21.1%	169	46.9%	90	25%	23	6.4%	2	0.6%

Figure (3): Total Perception Score of the Studied Future Couples regarding Premarital Screening and Genetic Counseling (N=360).

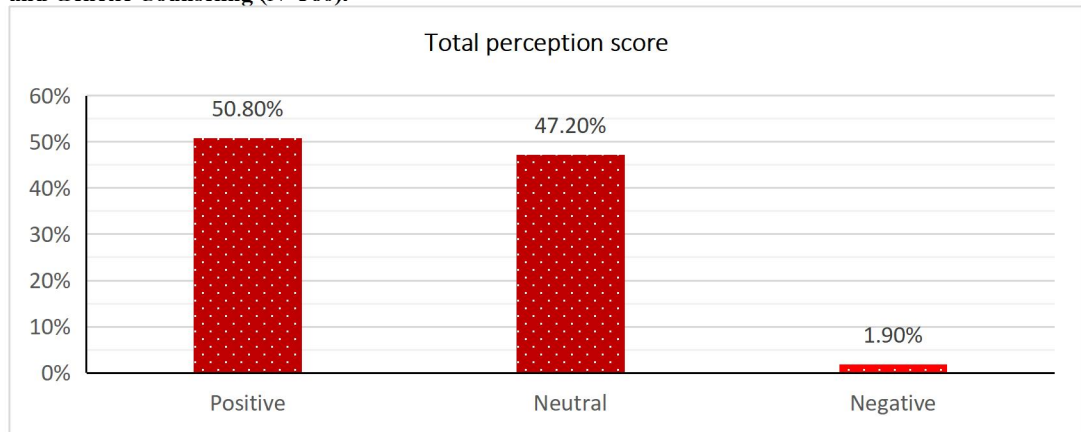


Table (4): Attitudes of the Studied Future Couples regarding Premarital Screening and Genetic Counseling (N=360).

Variables	The studied future couples					
	Disagree		uncertain		Agree	
	No.	%	No.	%	No.	%
- carryout premarital screening and genetic counseling	64	17.8%	42	11.7%	254	70.6%
- prefer relative marriage	270	75%	48	13.3%	42	11.7%
- Advise future couple to conduct PMCS	25	6.9%	33	9.2%	302	83.9%
- Appropriate time for carrying out PMSC is just before marriage	60	16.7%	40	11.1%	260	72.2%

Figure (4): Total Attitude Score of the Studied Future Couples regarding Premarital Screening and Genetic Counseling (N=360).

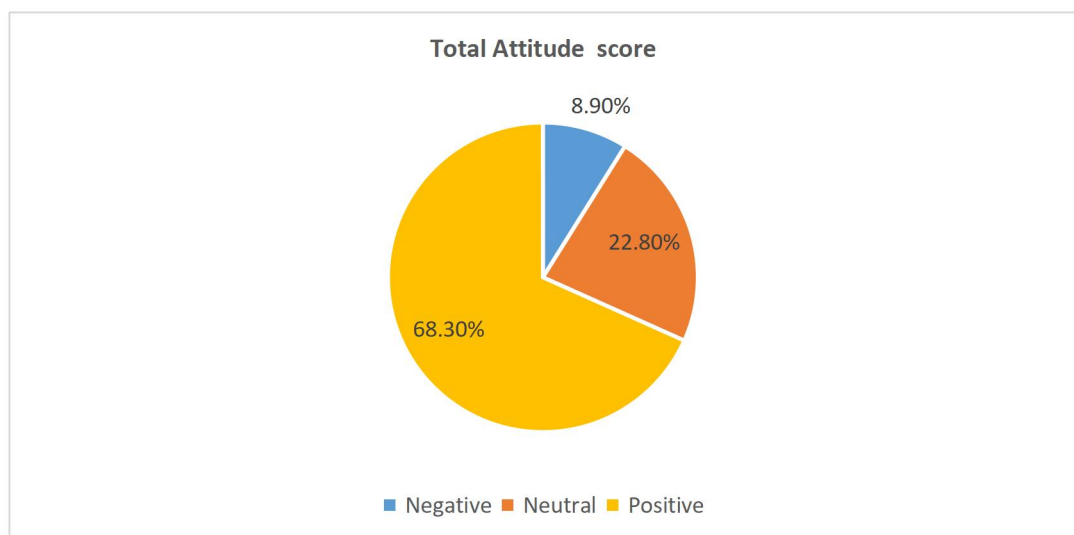


Table (5): Relationship between Total Knowledge Score of the Studied Future Couples and their demographic Characteristics regarding Premarital Screening and Genetic Counseling (N= 360).

Demographic Characteristics Regarding Fertility, Sexual Behavior and Contraception (N= 900)								
Variables	Inadequate		Moderate		Adequate		χ^2 test	P value
	No. 90	% 25%	No. 160	% 44.4%	No. 110	% 30.56%		
Age:								
- <30 years	74	82.2%	132	82.5%	84	76.4%	1.78	0.415
- 30≥years	16	17.8%	28	17.5%	29	23.6%		
gender:								
- Male	44	48.9%	73	45.6%	61	55.5%	2.534	0.282
- Female	46	51.1%	87	54.4%	49	44.5%		
Residence:								
- Rural	61	67.8%	116	72.5%	66	60%	4.647	0.098
- Urban	29	32.2%	44	27.5%	44	40%		
Education:								
- Illiterate	5	5.6%	4	2.5%	4	3.6%	99.811	<0.001**
- read and write	16	17.8%	14	8.8%	0	0%		
- secondary education	51	56.7%	75	46.9%	15	13.6%		
- Institute	9	10%	30	18.8%	24	21.8%		
- University	9	10%	34	21.3%	63	57.3%		
- post graduate	0	0%	3	1.9%	4	3.6%		
Income:								
- Enough	30	33.3%	77	48.1%	56	50.9%	7.11	0.029*
- Not enough	60	66.7%	83	51.9%	54	49.1%		
Parental consanguinity:								
- Yes	20	22.2%	56	35%	33	30%	4.46	0.107
- No	70	77.8%	104	65%	77	70%		
Personal history of hereditary disease:								
-Yes	0	0%	2	1.25%	6	5.5%	7.94	0.018*
- No	90	100%	158	98.75%	105	94.5%		
Family history of hereditary disease :								
- Yes	11	12.2%	19	11.9%	14	12.7%	0.044	0.978
- No	79	87.8%	141	88.1%	96	87.3%		

Table (6): Relationship between Total Perception Score of the Studied Future Couples and their demographic Characteristics regarding Premarital Screening and Genetic Counseling (N = 360)

socio-demographic characteristics	negative		Neutral		positive		χ^2 test	P value
	No. 7	% 1.9	No. 170	% 47.2	No. 183	% 50.8		
Age:								
- <30 years	7	100	136	80	147	80.3	1.729	0.421
- 30 \geq years	0	0	34	20	36	19.7		
gender:								
- Male	3	42.9	86	50.6	89	48.6	0.259	0.879
- Female	4	57.1	84	49.4	94	51.4		
Residence:								
- Rural	3	42.9	127	74.7	112	61.2	7.675	0.022*
- Urban	4	57.1	43	25.3	71	38.8		
Education:								
- Illiterate	2	28.6	7	4.1	2	1.1	137.3	<0.001**
- read and write	2	28.6	23	13.5	2	1.1		
- secondary	2	28.6	105	61.8	38	20.8		
- education	0	0.0	15	8.8	45	24.6		
- Institute	1	14.3	19	11.2	90	49.2		
- University	0	0.0	1	0.6	6	3.3		
- post graduate								
Income:								
- Enough	1	14.3	60	35.3	92	50.3	10.417	0.005*
- Not enough	6	85.7	110	64.7	91	49.7		
Parental consanguinity:								
- Yes	1	14.3	31	18.2	29	15.8	0.393	0.822
- No	6	85.7	139	81.8	154	84.2		
Personal history of hereditary disease:								
- Yes	0	0	6	3.5	4	2.2	0.793	0.673
- No	7	100	164	96.5	179	97.8		
Family history of hereditary disease:								
- Yes	1	14.3	20	11.8	23	12.6	0.081	0.960
- No	6	85.7	150	88.2	162	87.4		

Table (9): Correlation between the Total Knowledge Score, the Total Attitude Score and the Total Perception Score of Studied Future Couples regarding Premarital Screening (N=360).

Correlations			Knowledge scoring	perception score	Attitude score
Spearman's rho	Knowledge score	Correlation Coefficient	--	0.537	.171**
		P value	.	<0.001**	<0.001**
	Perception score	Correlation Coefficient	0.537**	--	0.107
		P value	<0.001**	.	.042*
	Attitude score	Correlation Coefficient	0.171	0.107	1.000
		P value	.001**	.042*	.

Discussion:

The findings of the current study revealed that the majority of the studied group's future couples' ages were from 18 to 30 years.

This finding was supported by **Moussa et al. (2018)** who studied "Knowledge and Attitude towards Premarital Screening and Genetic Counseling Program among Female University Students" in Saudi Arabia. Their finding reported that the studied group their ages ranged from 18 to 30 years. The researcher selected this age group because it is the age of marriage in Egypt.

Also, this finding was similar to a study performed by **Al-Kindi et al. (2012)** who studied "Knowledge and Attitude of University Students towards Premarital Screening Program" in Oman. Their findings revealed that all students' ages ranged from 18 to 27 years.

Furthermore, this finding was congruent with **Islam et al. (2022)** who investigated their studies on "Knowledge and Perception of and Attitude toward a Premarital Screening Program in Qatar". Their findings revealed that the majority of Qatar University students aged from 18 to 30 years.

The agreement between the results of the current study and previous studies might be related to the age of marriage in most Arab countries ranges between these ages and this is considered the important age for premarital screening and genetic counseling.

The current study revealed that slightly more than half of the studied future couples were female and slightly less than half were male. This is due to the sample of the current study being future couples.

This finding was in line with **Ali et al. (2018)** who investigated their studies on "Perception about Premarital Screening and Genetic Counseling among Males and Females Nursing Students" in Mansoura, Egypt. Their findings reported that slightly more than half

were female and slightly less than half were male.

Also, this finding was compatible with **Al-Shroby et al. (2021)** who conducted their studies about "Awareness of Premarital Screening and Genetic Counseling among Saudis and Its Association with Sociodemographic Factors" which mentioned that slightly more than half were female and slightly less than half were male.

In addition, **Al-Kindi et al. (2012)** who studied "Knowledge and Attitude of University Students towards Premarital Screening Program" in Oman reported that slightly more than half were female and slightly less than half were male. This means that it is preferable for the sample to include males and females because of the importance of the examination for both.

The present study showed that approximately three-quarters of the studied future couples weren't have parental consanguinity and only one-fourth of the studied future couples had parental consanguinity.

This finding was incongruent with **Yousifa et al. (2018)** who study the "Perception and Satisfaction of Premarital Screening and Genetic Counseling among Future Couples of Governmental Outpatient Clinics" in Port Said, Egypt. They concluded that one-third of the studied future couples had parental consanguinity. The agreement between the result of the current study and the previous study might be due to the study being conducted in the same country where people have the same culture and customs. And this is in line with the real rate of consanguineous marriage in Egypt, which ranges from the range one-fourth to two-third.

On the contrary, this finding wasn't in accordance with **Moussa et al. (2018)** who investigated "Knowledge and Attitude towards Premarital Screening and Genetic Counseling Program among Female University Students" in Saudi Arabia. Their finding reported that more

than two-quarter's experienced positive parental consanguinity. This contrast may be due to changes in culture and customs in each republic.

The present study showed that the majority of the studied future couples didn't have personal and family histories of hereditary diseases.

This finding was congruent with **Ali et al. (2018)** who conducted their studies on "Perception about Premarital Screening and Genetic Counseling among Males and Females Nursing Students" in Mansoura, Egypt. Their finding observed that the majority of the studied participants didn't have personal and family histories of hereditary diseases.

Concerning the education level of the studied future couples, the present study showed that nearly half of the studied future couples had a university education or higher.

This finding was in harmony with **Al-Shroby et al. (2021)** who examined "Awareness of Premarital Screening and Genetic Counseling among Saudis and Its Association with Sociodemographic Factors" in Saudi Arabia. Their finding showed that nearly half of the participants had a university education or higher.

Also, this finding was similar to **Yousifa et al. (2018)** who studied "perception and satisfaction of premarital screening and genetic counseling among future couples of governmental outpatient clinics" in Port Said, Egypt. They indicated that slightly less than half had a university degree or above.

The present study showed that more than half of the studied future couples didn't have enough income. This may be because more than two-quarters of them live in rural areas where there are few job opportunities and low income.

This finding was in accordance with **Moussa et al. (2018)** who indicated in their study in Saudi Arabia about "Knowledge and Attitude towards Premarital Screening and Genetic Counseling Program Among Female

University Students" that more than half didn't have enough income.

In addition, this finding was consistent with **Al-Shroby et al. (2021)** who examined "Awareness of Premarital Screening and Genetic Counseling among Saudis and Its Association with Sociodemographic Factors" in Saudi Arabia. Their finding showed that about half of the studied group didn't have enough income.

On the contrary: this finding was inconsistent with **Yousifa et al. (2018)** who conducted their study regarding "perception and satisfaction of premarital screening and genetic counseling among future couples of governmental outpatient clinics" in Port Said, Egypt. They reported that more than two quarters had enough monthly income.

The difference between the results of the present study and the previous studies might be related to more than three-quarter of their participants being from urban areas where there are a lot of job opportunities and high income.

Part II: Description of the finding regarding knowledge of the studied future couples regarding premarital screening and genetic counseling.

The present study documented that approximately three-quarters of the studied future couples had heard about PMSGC, but approximately two-third of the studied future couples had inadequate knowledge about premarital screening and genetic counseling. This low score of knowledge might be due to not having awareness- rising programs about premarital screening and genetic counseling.

These findings were in agreement with **Yousifa et al. (2018)** who investigated their studies concerning "Perception and Satisfaction of Premarital Screening and Genetic Counseling among Future Couples of Governmental Outpatient Clinics" In Port Said, Egypt. They indicated that the majority of the studied participants had heard about PMSGC and

approximately three-quarters of participants had inadequate knowledge.

In addition, these findings were in line with **Ali et al. (2018)** who investigated their studies on "Perception about Premarital Screening and Genetic Counseling among Males and Females Nursing Students" in Mansoura, Egypt. Their finding reported that the majority of studied subjects were aware of the availability of the PMSGC in Egypt but more than half didn't have correct knowledge about PMSGC

Also, these findings were compatible with **Ibrahim et al. (2013)** who conducted their studies on "An Education Program about Premarital Screening for Unmarried Female Students in King Abdul-Aziz University" their findings reported that the majority of students heard about the PMS program and the majority of the students obtained unsatisfactory knowledge scores.

Also, these findings were in line with **Moussa et al. (2018)** who studied "Knowledge and Attitude towards Premarital Screening and Genetic Counseling Program among Female University Students" in Saudi Arabia reported that the majority of the participants were aware of the availability of program but unfortunately, their knowledge considering the diseases was not sufficient.

Furthermore, these findings were compatible with **Al-Shroby et al. (2021)** who conducted their studies on "Awareness of Premarital Screening and Genetic Counseling among Saudis and Its Association with Socio-Demographic Factors" in Saudi Arabia, reported that all study participants had heard about PMSGC and regarding total knowledge score only about ten percent had satisfactory knowledge.

The agreement between the results of the current study and previous studies might be due to a lack of ability to appreciate the seriousness of genetic disorders.

The current study illustrated that friends and family were the sources of knowledge about premarital screening and genetic counseling.

This finding was in the same line of **Moussa et al. (2018)** who studied "Knowledge and Attitude towards Premarital Screening and Genetic Counseling Program among Female University Students" in Saudi Arabia. Their finding reported that the main source of information on PMS was from relatives and family.

Also, **Al-Shroby et al. (2021)** investigated "Awareness of Premarital Screening and Genetic Counseling among Saudis and its Association with Socio-Demographic Factors" in Saudi Arabia. Their finding reported that the main source of knowledge about the premarital screening was relatives and friends

In addition, these findings were consistent with **Yousifa et al. (2018)** who implemented their studies on "Perception and Satisfaction of Premarital Screening and Genetic Counseling among Future Couples of Governmental Outpatient Clinics" In Port Said, Egypt. They indicated that the main source of information among future couples about premarital screening was family and friends

Also **Ibrahim et al. (2013)** who studied "An Education Program about Premarital Screening for Unmarried Female Students in King Abdul-Aziz University" reported that that family and friends represented the commonest source of knowledge about premarital screening.

The similarity between the results of the current studies and previous studies might be due to all study conducted in Arab areas and a lack of awareness about premarital screening and genetic counseling.

On the contrary, this finding was inconsistent with **Ali et al. (2018)** who investigated their studies on "Perception about Premarital Screening and Genetic Counseling among Males and Females Nursing Students" in Mansoura, Egypt. Their finding reported that

the main source of students' information on PMSGC was school/faculty. This contraindication is due to the selected sample of nursing students.

Also, Mohamed (2015) who studied "Premarital Care: Health Promotion Program for Female Students in An Shams University". Their findings reported that the main source of knowledge was school or university. This contraindication is due to the fact that all selected samples were from universities.

Part III: Description of the findings regarding the perception of the studied future couples regarding premarital screening and genetic counseling:-

The findings of the current study documented that more than half of the studied future couples had a positive perception of premarital screening and genetic counseling. Approximately three - quarter of the studied future couples strongly agree that PMSGC is important for future couples, it is important to increase awareness about PMSGC before marriage, PMSGC will reduce the prevalence of some genetic diseases, PMSGC will reduce the prevalence of some sexual transmitted diseases, consanguinity can increase the risk of hereditary diseases, religious people should adopt the ideas of PMSGC in their discussion, marriage decision must be left for freedom of the couple in detecting STDs, the law should obligate all future couples to do PMSGC is important, any disease appeared in one of the couple had to be treated before marriage and the majority of future couples strongly agree that medical counseling is important to be given after getting the results

The current study findings were in the same line with Ali et al. (2018) who conducted their studies on "Perception about Premarital Screening and Genetic Counseling among Males and Females Nursing Students" in Mansoura, Egypt. Their findings reported that most of the participants had a positive perception regarding PMSGC and the majority of participants agree that it's important to carry out PMSGC, PMSGC prevents transmission of

diseases, blood relationship is the main cause of genetic diseases and approximately three - quarter of the participants agree that PMSGC must be obligatory and any diseases appeared on one couple must be treated before marriage.

In addition, these findings were in accordance with the findings of Yousifa et al. (2018) who implemented their studies on "Perception and Satisfaction of Premarital Screening and Genetic Counseling among Future Couples of Governmental Outpatient Clinics" In Port Said, Egypt. They indicated that most of the participants had a positive perception regarding premarital screening and genetic counseling and the majority of participants agreed that PMSGC is important for future couples, decreases the occurrence of genetic or inherited diseases and STDs, consanguinity is the main cause of genetic diseases and two - third of the participants agreed that when future couples carrying inherited disease or STDs, decision of marriage must be left for them, PMSGC essential to be obligatory, religious personnel should adopt the concepts of PMSGC in their talk.

Meanwhile, Abd-Allah, (2016) who studied "Assessment of Perception Regarding Premarital Screening among Ain-Shams University Students" reported that the majority of the studied sample had a negative perception about the reason of arises diseases as the result of consanguinity marriage.

The difference between the results of the current study and previous studies might be related to many factors such as health personals professional knowledge, past experience of individuals, care providers' technical competence, and access to health facilities where all of these factors affected on the perception of individuals.

Part IV: Description of the findings regarding the attitude of the studied future couples regarding premarital screening and genetic counseling:-

The current study results portrayed that almost two-thirds of the studied future couples

had a positive attitude and agreed to carry out PMSGC.

These findings were in agreement with the study conducted by Al howiti, et al. (2019) who studied "Premarital Screening Program Knowledge and Attitude among Saudi University Students in Tabuk City" reported that almost two-thirds of the students had a positive attitude towards premarital screening

In addition, these findings were consistent with Moussa et al. (2018) who studied "Knowledge and Attitude Towards Premarital Screening and Genetic Counseling Program among Female University Students" in Saudi Arabia. Their findings reported that approximately three-quarters of participants had a positive attitude towards premarital screening and genetic counseling programs and agree that it is important to carry out premarital screening.

Also, these findings were in line with Al-Shroby et al. (2021) who investigated "Awareness of Premarital Screening and Genetic Counseling among Saudis and its Association with Socio-Demographic Factors" in Saudi Arabia. Their findings reported that the majority of participants had a positive attitude towards the importance of PMSGC. The agreement between the results of the current study and previous studies reflects that the future couples had a respectable thought of the value of premarital screening programs.

Part X: Description of the findings regarding the correlation among the total knowledge score, the total attitude score and the total perception score of studied future couples regarding premarital screening.

The present study revealed that there were a positive correlation and a highly statistically significant difference among the total knowledge score, the total attitude score and the total perception score of studied future couples regarding premarital screening

These findings were in agreement with Al-Shafai, et al. (2022) who studied knowledge and perception of and attitude toward a

premarital screening program in Qatar, reported that there were a positive correlation among the total knowledge score, the total attitude score and the total perception score of studied future couples regarding premarital screening

In addition, these findings were in line with the study conducted by Al howiti, et al. (2019) who studied "Premarital Screening Program Knowledge and Attitude among Saudi University Students in Tabuk City" reported that there were a highly statistically significant difference among the total knowledge score, the total attitude score and the total perception score of studied future couples regarding premarital screening.

Also, these findings were in accordance with the study conducted by Ali, et al (2018) who studied "Premarital Screening and Genetic Counseling among Males and Females Nursing Students" in Mansoura, Egypt. Their findings reported there was a highly positive correlation between study subjects' total knowledge, their total perception and attitudes.

Conclusion

According to the findings of the present study it can be concluded that:

More than half of the studied future couples had a positive perception of premarital screening and genetic counseling and approximately three-quarter of the studied future couples strongly agreed on the benefits and the importance of premarital screening and genetic counseling. This answered the first research question

There were highly statistically significant differences among the total perception of the studied future couples regarding premarital screening and genetic counseling and their demographic characteristics: level of education, residence and income. This answered the second research question.

Recommendations

Based on the findings of the current study, the following are recommended:

- Increasing knowledge of the community regarding premarital screening and genetic counseling in collaboration with adequate religious support and government policy

- Broadcasting of information about the premarital programs through official education, different types of mass media and public education program regarding tests of premarital screening and genetic counseling and complication of consanguinity.

- Incorporate the benefits of premarital screening and genetic counseling in high school and university curricula.

Suggestions for future studies:-

- Providing health education programs to raise awareness and knowledge of single young people regarding premarital screening and genetic counseling.

- Studying the effect of education programs on university students' knowledge, perception and attitude, regarding premarital screening and genetic counseling.

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