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Knowledge, attitude, and satisfaction about premarital screening in Diyala City/ 2022

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Abstract
Background: Premarital screening reduces the occurrence of specific illnesses and their social impact. It is one of the best ways to avoid genetic illnesses, congenital anomalies, and medical and psychological marriage issues. Increasing target population awareness, positive attitude, and satisfaction with premarital screening will boost programmer use and success. Objectives: To assess couples' knowledge and attitude about premarital screening at Al-Batool Teaching Hospital's premarital care clinic, identify factors affecting knowledge and attitude, and assess satisfaction with clinic services.
Method: A cross-section study was conducted in Diyala City, at Al-Batool Teaching Hospital, during the period from the 1st of January 2022 to the 30th of November, targeting all the couples attending premarital care clinic at Al-Batool Teaching Hospital, during this period. Results: In this study, 800 participants participated. The majority, 510 (63.8%) were 20-29 years old. Only 9 (1.1%) had a personal history of genetic illness, whereas 20 (2.5%) had a family history. 21.4% of 171 had good knowledge. 82.3% of 658 had a favourable attitude. 673 (84.1%) were satisfied.
Conclusion: Few study participants were knowledgeable. A positive attitude and pleasure were noted. Poor knowledge, attitude, and contentment were highest among females, younger than 30, rural inhabitants, those with less than intermediate education, and the jobless.

Keywords: Knowledge, attitude, satisfaction, premarital, screening, Diyala

Introduction

Premarital screening (PMS) is a preventive health strategy aimed at couples planning to marry, focusing on identifying genetic blood disorders such as sickle cell anemia and thalassemia, as well as infectious diseases like hepatitis B, C, and HIV/AIDS. This process helps detect potential health risks for individuals and their future offspring, enabling informed decisions and necessary medical interventions [1]. The primary goal of PMS is to reduce the prevalence and societal impact of targeted diseases, with its implementation varying by country based on regional disease prevalence and legal requirements. For example, in the Kingdom of Saudi Arabia, it's mandatory to screen for hepatitis B and C, thalassemia, sickle cell disease, and HIV, while Qatar also includes tests for homocystinuria, cystic fibrosis, and rubella, among others [2, 3]. The program's success hinges on client satisfaction, which is a measure of the extent to which the health services meet individuals' expectations and needs. High satisfaction levels are crucial as they encourage the utilization of health services, adherence to follow-up appointments, and positive word-of-mouth, ultimately influencing the program's effectiveness and the outcomes of care [4, 5]. Premarital counseling, part of PMS, extends beyond disease prevention, also enhancing interpersonal skills and relationship quality, thereby improving life quality for couples and reducing the risk of future marital problems [1, 6]. In the context of genetic blood disorders, thalassemia and sickle cell disease are of particular concern in the Middle East, including Iraq, where consanguineous marriages are common. These genetic conditions pose significant health burdens, with thalassemia being the most prevalent inherited anemia in Iraq. Despite efforts, a study on PMS and genetic counseling in the Middle East showed that only in Iraq, Turkey, and Iran was there a significant reduction in marriages at risk, highlighting the challenge of achieving desired outcomes in genetic disorder prevention [7, 8]. The incidence of sexually transmitted diseases (STDs), including hepatitis B, C, and HIV, remains a global health challenge, with millions of new infections and deaths annually. Hepatitis B and C are major causes of chronic liver disease and cancer, with transmission routes including vertical transmission, sexual contact, and blood transfusion.

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Despite the asymptomatic nature of many infections, chronic hepatitis can lead to significant health complications and psychosocial issues [9, 10]. The economic burden of managing these diseases is substantial, particularly in countries like Iraq, where the cost of treating thalassemia alone can reach nearly $1 billion over 25 years [11]. HIV and syphilis are other critical concerns addressed by PMS. The global HIV epidemic has seen shifts with improved access to treatment, though costs associated with HIV care remain significantly higher than for those without the infection [12, 13]. Syphilis, a bacterial infection, can lead to severe health outcomes if untreated and poses an increased risk of HIV transmission. Premarital screening for syphilis can prevent its sexual transmission and reduce the incidence of congenital syphilis, which can have devastating effects on newborns [14, 15]. The aim of study is to evaluate the level of knowledge and attitudes exhibited by couples who visit the premarital care clinic at Al-Batool Teaching Hospital regarding premarital screening. Determine the variables that influence knowledge and attitude. Determine the level of participant satisfaction with the premarital care clinic services offered at Al-Batool Teaching Hospital.

Method
The study conducted at Al-Batool Teaching Hospital in Diyala City between January 1st and November 30th, 2022, aimed to evaluate the knowledge, attitudes, and satisfaction levels of couples attending a premarital care clinic regarding premarital screening (PMS). The study encompassed all couples visiting the clinic on data collection days, with the researcher attending twice weekly for six hours each session. Data was collected through direct interviews using a comprehensive form developed and reviewed by the research team. The form was divided into five parts:

1. **Socio-Demographic Information:** This section gathered basic personal and familial details such as age, gender, address, marital status, education, occupation, consanguinity, marital officiation, and histories of hereditary diseases.
2. **Knowledge about PMS:** Examined awareness and sources of information regarding PMS, reasons for screening, and knowledge of specific diseases relevant to PMS.
3. **Attitudes toward PMS:** Assessed participants' views on the importance and necessity of PMS, willingness to recommend PMS to others, and opinions on the impact of consanguinity on hereditary diseases.
4. **Satisfaction with PMS:** Evaluated the logistical and interpersonal aspects of the PMS process, including location convenience, sample collection, waiting areas, staff behavior, and counseling services.
5. **Services provided in the PMS Center:** Reviewed the range of services offered at the center, including medical history collection, appointment scheduling, blood sample collection, drug history documentation, tetanus vaccination for females, and educational / counseling services.

Participant responses were scored using a three-level Likert scale (0 for No/Bad, 1 for Neutral, 2 for Yes/Good), and the scores were analyzed to classify knowledge, attitudes, and satisfaction into three levels: poor (score < 50%), average (score 50-75%), and good (score > 75%).

The study utilized Microsoft Excel and SPSS for data analysis, presenting continuous variables as means and standard deviations, and categorical variables as frequencies and percentages. The Chi-square test was employed to explore associations between categorical variables, with a p-value of <0.05 deemed statistically significant.

Results
A total of 800 people were included in the current study. The majority 510 (63.8%) were between the age (20-29 years). Participants living in urban were 500 (62.5%). Those who married for the second time were 101 (12.6%). Participants with primary education were 200 (25.0%), and with university and above 233 (29.1%). Unemployed were 490 (61.3%) and no consanguinity was among 600 (75.0%) (Table 1).

Table 1: Sociodemographic characteristics of the study sample (N=800)

Variables		N.	%
	< 20 years	147	18.4
	20 - 29 years	510	63.8
Age groups	30 - 39 years	102	12.8
	40 - 49 years	26	3.3
	≥ 50 years	15	1.9
Gender	Male	400	50.0
	Female	400	50.0
Address	Urban	500	62.5
	Rural	300	37.5
Marital status	First time	699	87.4
	Second time	101	12.6
	Read and write /Illiterate	124	15.5
	Primary	200	25.0
Educational level	Intermediate	125	15.6
	Secondary	118	14.8
	University and above	233	29.1
	Employed	187	23.4
Job	Unemployed	490	61.3
	Student	123	15.4
	Second degree	120	15.0
Consanguinity	Third degree	80	10.0
	None	600	75.0

Although more than half of the participants (448 (56.0%)) heard about PMS, more than two thirds of them (617 (77.1%)) had no information about the regional PMCS clinic (Table 2). Regarding the knowledge about the diseases that were included in PMC; the highest proportion of awareness was for anemia in 734 (91.8%) of the participants, followed by RH factor in 579 (72.4%), then Hepatitis in 456 (57.0%) and the least was for Sickle cell anemia in 47 (5.9%) (Table 2).

Table 2: Knowledge about PMS and about the diseases included in PMS

Items	No		Yes	
	N.	%	N.	%
Heard about PMS before the court	352	44.0	448	56.0
Identify regional PMCS clinic	617	77.1	183	22.9
Heard about the following diseases				
Sickle cell anemia	753	94.1	47	5.9
Iron deficiency anemia	66	8.3	734	91.8
STD	426	53.5	374	46.8
Thalassemia	684	85.5	116	14.5
Hepatitis diseases	344	43.0	456	57.0
Rh factor	221	27.6	579	72.4

The majority reported (yes) as their attitude for "Thinking that carrying out premarital screening is important / 747 (93.4%)", "Agreement on making premarital screening as an obligatory procedure before marriage / 740 (92.5%)", "Will advise future spouse to do PMCS / 730 (91.3%)", "Agreement to carry out premarital screening / 797 (99.6%)", "Consanguinity may lead to hereditary diseases/480 (60.1%)", "PMS will contribute to reduction of prevalence of some genetic and STDs/526 (65.8%)", and "the importance to raise awareness about PMS before marriage to reduce genetic and STDs / 670 (83.8%)". Whereas the majority reported (no) as their attitude for "The result of premarital screening (infection, genetic disease) is positive, so is your decision to stop the marriage/597 (74.7%)". As clarified in (Table 3).

Table 3: The Attitude toward PMS (N=800)

Items	No		Neutral		Yes	
	N.	%	N.	%	N.	%
Thinking that carrying out premarital screening is important	5	0.6	48	6.0	747	93.4
Agreement on making premarital screening as an obligatory procedure before marriage	6	0.8	54	6.8	740	92.5
Will advise future couples to do PMCS	5	0.6	65	8.1	730	91.3
Agreement to carry out premarital screening	1	0.1	2	0.3	797	99.6
Consanguinity may lead to hereditary diseases	102	12.8	217	27.2	480	60.1
PMS will contribute to reduction of prevalence of some genetic and STDs	34	4.3	239	29.9	526	65.8
Agreement on raising awareness about PMS before marriage to reduce genetic and STDs	3	0.4	127	15.9	670	83.8
The result of premarital screening (infection, genetic disease) is positive, so is your decision to stop the marriage	597	74.7	144	18.0	58	7.3

Regarding participants' satisfaction with PMS services; (Table 4) showed that the highest satisfaction was with doctors' reception and behavior in 726 (90.8%), and the least was with waiting time in 461 (57.6%).

Table 4: Participants' satisfaction with PMS services (N=800)

Items	Bad		Neutral		Good	
	N.	%	N.	%	N.	%
Place of PM (close/far from home)	252	31.5	154	19.3	394	49.3
Place of taken a blood sample	4	0.5	94	11.8	702	87.8
Waiting time	45	5.6	294	36.8	461	57.6
Doctors' reception and behavior	0	0.0	74	9.3	726	90.8
Other counseling staffs, reception, and behavior	1	0.1	108	13.5	691	86.4
Place for counseling	10	1.3	162	20.3	628	78.5

Good knowledge level was among 171 (21.4%). Good attitude level was among 658 (82.3%). Good satisfaction was among 673 (84.1%). As shown in (Table 5).

Table 5: The level of knowledge, attitude, and satisfaction with PMS

Scales	Poor		Average		Good	
	N.	%	N.	%	N.	%
Knowledge level	388	48.5	241	30.1	171	21.4
Attitude level	13	1.6	129	16.1	658	82.3
Satisfaction level	14	1.8	113	14.1	673	84.1
Total = 800						

Participants younger than 30 years had the highest proportion of poor knowledge level 329 (50.1%) without statistical significance (P=0.065).
Females were significantly ($p<0.001$) having the highest proportion of poor knowledge 288 (57.0%). Participants living in rural were significantly (P=0.006) having the highest proportion of poor knowledge 164 (54.7%). Participants that Illiterate/ Read and write/primary/and intermediate education were significantly ($p<0.001$) having the highest proportion of poor knowledge level 334 (74.4%).
Participants that employed were significantly ($p<0.001$)

having the highest proportion of good knowledge level 84 (44.9%), in contrast participants that unemployed were having the highest proportion of poor knowledge level 309 (63.1%). As shown in (Table 6).

Table 6: The association of participant's knowledge level with their sociodemographic factors

Variables		Poor		Average		Good		P- value
		N.	%	N.	%	N.	%	
Age groups	< 30 years	329	50.1	197	30.0	131	19.9	0.065
	≥ 30 years	59	41.3	44	30.8	40	28.0	
Gender	Male	160	40.0	144	36.0	96	24.0	<0.001
	Female	228	57.0	97	24.3	75	18.8	
Address	Urban	224	44.8	153	30.6	123	24.6	0.006
	Rural	164	54.7	88	29.3	48	16.0	
Marital status	First time	340	48.6	209	29.9	150	21.5	0.935
	Second time	48	47.5	32	31.7	21	20.8	
Educational level	Illiterate / Read and write/ Primary / Intermediate	334	74.4	93	20.7	22	4.9	<0.001
	Secondary/ University and above	54	15.4	148	42.2	149	42.5	
Job	Employed	35	18.7	68	36.4	84	44.9	<0.001
	Unemployed	309	63.1	118	24.1	63	12.9	
	Student	44	35.8	55	44.7	24	19.5	
Hereditary disease	Yes	7	35.0	5	25.0	8	40.0	0.118
	No	381	48.8	236	30.3	163	20.9	

The highest proportion of participants with poor and average attitude level were among age group <30years [13,(2.0%), and 115(17.5%) respectively, P=0.014]. Male participants were significantly (P=0.006) with the highest proportion of good attitude level reported among 343 (85.8%) of them. Also, employed participants were significantly (*p*<0.001) with the highest proportion of good attitude level reported among 179 (95.7%) of them. The highest proportion of participants with poor and average attitude level were among education level Illiterate /Read and write/ Primary/ Intermediate [13, (2.9%), and 117 (26.1%) respectively, *p*<0.001]. As illustrated in (Table 7).

Table 7: The association of participant's attitude level with their sociodemographic factors

Variables		Poor		Average		Good		P- value
		N.	%	N.	%	N.	%	
Age groups	< 30 years	13	2.0	115	17.5	529	80.5	0.014
	≥ 30 years	0	0.0	14	9.8	129	90.2	
Gender	Male	2	0.5	55	13.8	343	85.8	0.006
	Female	11	2.8	74	18.5	315	78.8	
Address	Urban	8	1.6	69	13.8	423	84.6	0.068
	Rural	5	1.7	60	20.0	235	78.3	
Marital status	First time	12	1.7	115	16.5	572	81.8	0.680
	Second time	1	1.0	14	13.9	86	85.1	
Educational level	Illiterate /Read and write/ Primary/ Intermediate	13	2.9	117	26.1	319	71.0	<0.001
	Secondary/ University and above	0	0.0	12	3.4	339	96.6	
Job	Employed	0	0.0	8	4.3	179	95.7	<0.001*
	Unemployed	13	2.7	109	22.2	368	75.1	
	Student	0	0.0	12	9.8	111	90.2	
Hereditary disease	Yes	0	0.0	3	15.0	17	85.0	--
	No	13	1.7	126	16.2	641	82.2	

* Exact test was used significance at *p*<0.05.

Participants who live in urban were significantly (<0.001) with the highest proportion of good satisfaction level reported among 453 (90.6%) of them. Also, employed participants were significantly (P=0.015) with the highest proportion of good satisfaction level reported among 164 (87.7%) of them. The highest proportion of participants with poor and average satisfaction level were among education level Illiterate /Read and write/ Primary/ Intermediate [12, (2.7%), and 70 (15.6%) respectively, P=0.027]. As illustrated in (Table 8).

Table 8: The association of participant's satisfaction level with their sociodemographic factors

Variables		Satisfaction level						P- value
		Poor		Average		Good		
		N.	%	N.	%	N.	%	
Age groups	< 30 years	10	1.5	95	14.5	552	84.0	0.500
	≥ 30 years	4	2.8	18	12.6	121	84.6	
Gender	Male	7	1.8	55	13.8	338	84.5	0.955
	Female	7	1.8	58	14.5	335	83.8	
Address	Urban	2	0.4	45	9.0	453	90.6	<0.001
	Rural	12	4.0	68	22.7	220	73.3	
Marital status	First time	13	1.9	96	13.7	590	84.4	0.597
	Second time	1	1.0	17	16.8	83	82.2	
Educational level	Illiterate /Read and write/ Primary/ Intermediate	12	2.7	70	15.6	367	81.7	0.027
	Secondary/ University and above	2	0.6	43	12.3	306	87.2	
Job	Employed	2	1.1	21	11.2	164	87.7	0.015*
	Unemployed	12	2.4	64	13.1	414	84.5	
	Student	0	0.0	28	22.8	95	77.2	
Hereditary disease	Yes	0	0.0	4	20.0	16	80.0	0.659*
	No	14	1.8	109	14.0	657	84.2	

*Exact test was used significance at *p*<0.05.

Discussion

This study, conducted at Al-Batool Teaching Hospital in Diyala City, focused on evaluating the impact of consanguineous marriages (CMs) on the prevalence of congenital diseases in the Middle East, emphasizing the role of premarital screening (PMSGC) in reducing the transmission of genetic and sexually transmitted diseases. The PMS program specifically aims to screen potential couples for genetic disorders and provide medical and genetic counseling based on the screening outcomes. Key findings from the study include a significant adult participation rate (63.8% aged 20-29), with a high unemployment rate (61.3%) and a considerable portion of participants having attained university level education (29.1%). This demographic data contrasts with a similar study conducted in Oman by Al-Farsi OA, *et al*., 2014 [16], which reported a younger participant age range (20-25) and higher employment and high school diploma attainment rates. The discrepancy is attributed to the unstable socio-economic conditions in Iraq, influenced by conflicts and job scarcity. Marriage dynamics revealed that 12.6% of participants were in a second marriage, aligning with cultural acceptance across Arab countries, as also observed in a Saudi Arabian study by Melaibari M, *et al*., 2018 [17]. Urban residency was predominant (62.5%), with a significant majority lacking consanguinity (74.9%), possibly due to better access to genetic counseling services in urban settings, as noted by Bener A, *et al*., 2019 [18], in Turkey. Awareness of PMS was reported by 56.0% of participants, with a notable gap in knowledge about regional PMCS clinics when compared to findings from Oman, suggesting a need for improved health education strategies. The primary source of PMS information was friends (57.6%), indicating the potential for educational institutions to play a more significant role in disseminating PMS information, as observed in Oman by Al Kindi R, *et al*., 2012 [19]. The motivation for undergoing PMS was primarily to ensure fitness for marriage (38.8%), reflecting a high awareness of PMS benefits. The study revealed a strong consensus (99.6%) in favor of conducting PMS, though a majority (74.7%) would not terminate a marriage based on positive screening results, underscoring the complex interplay of cultural, social, and emotional factors in decision-making. Satisfaction with PMS services was high, particularly regarding the doctors' reception and behavior (90.8%), contrasting with lower satisfaction levels reported in a Jeddah study by Ibrahim NK, *et al*., 2013 [20]. This discrepancy highlights the importance of accessible healthcare facilities and quality doctor-patient interactions. Blood tests revealed low rates of HBV and HCV but a significant prevalence of anemia (15.8%), emphasizing the need for broader awareness and preventive measures, especially when compared to findings from Egypt by Alkalash SH, *et al*., 2021 [21]. The study concluded with high levels of good knowledge (21.4%), attitude (82.3%), and satisfaction (84.1%) among participants, differing from the Egyptian study by Alkalash SH, *et al*., 2021 [21], which reported higher knowledge but similar attitude and satisfaction levels. These variations underscore the influence of healthcare service quality and educational outreach on public health outcomes. Notably, poor knowledge and attitude levels were primarily found among female participants, the young, and those with lower educational levels. This trend mirrors findings from Kuwait by Al-Enezi *et al*., 2017 [22], though the current study's broader educational scope and equal gender representation offer a distinct comparison. The findings highlight the critical role of education in enhancing health awareness and the need for targeted outreach in rural areas, where residents often exhibit lower levels of knowledge and awareness.

Conclusion

The study revealed that while a majority exhibited positive attitudes and high satisfaction towards premarital screening (PMS), less than a quarter demonstrated good knowledge of PMS. Notably, participants younger than 30 showed lower knowledge and attitudes towards PMS, with females displaying significantly poorer understanding and attitudes compared to males. Urban dwellers outperformed their rural counterparts in knowledge and satisfaction of PMS, though their higher attitude levels did not reach statistical significance. Lower educational attainment (below intermediate level) and unemployment were associated with diminished knowledge, attitudes, and satisfaction towards

PMS, underscoring the impact of socio-demographic factors on PMS perceptions.

Conflict of Interest
Not available

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Not available

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