

Awareness, Attitudes, and Willingness Toward Premarital Screening in Oman: Evidence from South Al-Sharqiyah Governorate

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Abstract

Objectives: To assess knowledge, attitudes, and determinants of willingness toward premarital screening (PMS) among adults in South Al-Sharqiyah Governorate, Oman.

Methods: A cross-sectional analytical study was conducted among 583 adults in South Al-Sharqiyah Governorate, Oman. Participants were recruited through convenience sampling via social media platforms, primarily WhatsApp, to facilitate broad community reach. Data were collected using an adapted structured online questionnaire based on KAP framework. Statistical analysis included descriptive statistics and multivariable logistic regression. Ethical approval obtained from the Ministry of Health Research and Studies Centre, Muscat, Oman (Ref. MoH/CSR/23/27632).

Results: Of the 583 participants, 93% expressed willingness to undergo PMS and 94.3% considered it important. Awareness of the national PMS program was reported by 63.8% and was a significant predictor of willingness (aOR = 2.65; 95% CI: 1.13–6.22; p = 0.026). Participants aged 18–24 years were significantly less likely to express willingness to undergo PMS compared with those aged 36–40 years (aOR = 0.32, 95% CI: 0.14–0.76, p = 0.009). No significant associations were observed between willingness and most sociodemographic characteristics including gender, education, and personal or family history of genetic disease. Support for mandatory PMS was high (85.8%), while concerns included religious beliefs (39.4%) and conditional or uncertain marital decisions following positive screening results (47%).

Conclusion: Acceptance of PMS in South Al-Sharqiyah Governorate is high. Awareness of the national program is the strongest determinant of willingness toward PMS, while younger adults demonstrated lower willingness to participate in screening. These findings provide an important baseline for evaluating public readiness following the 2026 transition to mandatory screening in Oman. Consequently, targeted, youth-focused awareness initiatives and integration of PMS education into schools and universities may enhance participation and support public health efforts in Oman.

Keywords: Premarital screening; Awareness; Knowledge; Attitude; Genetic diseases; Oman; Public health

Introduction

Premarital screening (PMS) is a cornerstone preventive public health strategy aimed at reducing the burden of genetic and transmissible diseases before marriage, while also helping prevent long-term health complications associated with hereditary disorders.^{1,2} It plays a vital role in regions with a high prevalence of consanguineous marriages, where autosomal recessive genetic disorders are more prevalent.^{1,2} By identifying genetic incompatibilities and infectious diseases early, PMS enables couples to make informed reproductive decisions and supports long-term public health outcomes.^{2,3}

Globally, PMS programs have effectively reduced the incidence of hemoglobinopathies and helped prevent transmission of infectious diseases such as hepatitis B, hepatitis C, and HIV.³ In the Gulf Cooperation Council (GCC) countries, where cultural and familial structures often favor consanguineous marriage, PMS programs have been widely implemented as part of public health strategies to reduce the burden of genetic diseases.³ However, despite the widespread implementation, evidence from the region indicates that program effectiveness is influenced not only by its availability but also by public knowledge, attitudes, and willingness toward screening.

In Oman, the national PMS program forms part of broader genetic disease prevention and maternal–child health strategies implemented by the Ministry of Health.⁴ The program was first introduced in Oman in 2004 as a voluntary service targeting hereditary blood disorders, particularly sickle cell disease and thalassemia, in addition to selected transmissible diseases.⁴ Hereditary blood disorders continue to impose a considerable public health and socioeconomic burden in Oman.⁵ Individuals with β -thalassemia often require lifelong blood transfusions and repeated hospital visits, resulting in significant physical, psychological, and social consequences.⁶ Similarly, sickle cell disease is associated with reduced health-related quality of life and ongoing morbidity among affected individuals and families.⁷

In response to this public health burden, Oman has recently strengthened its preventive strategy by introducing mandatory premarital screening. While the program was voluntary during the data collection period in late 2025, mandatory PMS was introduced under Royal Decree No. 111/2025, issued on 31 December 2025, with implementation beginning in 2026.⁸ This policy transition aims to reduce the prevalence of hereditary and infectious diseases and to alleviate their long-term burden on the healthcare system. As this study was conducted during the final phase of the voluntary system, it provides important baseline evidence on public acceptance and willingness toward PMS, which may support evaluation of readiness for implementation of the mandatory framework.

Despite high reported acceptance of PMS in Oman and other GCC countries, existing studies indicate that acceptance does not always translate into actual willingness or behavioral uptake.^{9–11} This gap between attitudes and willingness has been linked to multiple factors, including age, educational level, perceived risk, and awareness of the screening program.^{12,13} Evidence also suggests that willingness toward PMS is shaped by a combination of sociodemographic and informational determinants rather than attitudes alone.¹⁴ Educational and awareness-based interventions in some GCC settings have been associated with improved knowledge and more positive attitudes toward PMS.^{15,16} Conversely, limited awareness and misconceptions—particularly among younger adults—may reduce perceived relevance and willingness to participate in screening.^{12,14}

However, most studies in Oman and the GCC have focused on awareness and attitudes, particularly among students or urban populations, with limited emphasis on determinants of willingness in community-based settings. Furthermore, evidence from semi-rural and governorate-level populations in Oman, such as South Al-Sharqiyah, remains limited. This is important, as sociocultural structures, tribal composition, and consanguinity patterns may differ from urban regions, potentially influencing screening behaviors. These gaps limit the generalizability of existing findings and highlight the need for context-specific evidence to guide targeted public health interventions.

Therefore, this study aims to assess the knowledge, attitudes, and determinants of willingness toward PMS among adults in South Al-Sharqiyah Governorate, Oman. In addition, it investigates the association between willingness and sociodemographic characteristics. By identifying key factors associated with willingness toward PMS, this study provides evidence to inform national policy development and regional health planning, while contributing to the international literature on preventive genetic screening in culturally diverse settings.

Methods

A cross-sectional analytical study was conducted in South Al-Sharqiyah Governorate, Oman, between August 25, 2025, and November 12, 2025. This governorate comprises five wilayats (Sur, Jalan Bani Bu Ali, Jalan Bani Bu Hassan, Al-Kamil and Al-Wafi, and Masirah) and is characterized by traditional social structures and relatively high rates of consanguinity.

The study population consisted of adults aged 18–40 residing within the five wilayats of South Al-Sharqiyah Governorate. Participants were recruited using a non-probability convenience sampling technique via social media platforms, primarily WhatsApp, to facilitate broad community participation across the geographically dispersed wilayats.

The minimum required sample size was calculated at 384 participants using Cochran's formula based on a 95% confidence level and a 5% margin of error. A final sample of 583 participants was included in the analysis, substantially exceeding the calculated minimum sample size and thereby enhancing the statistical reliability of the findings. The response rate was 89.7%.

Data were collected using a structured, self-administered online questionnaire adapted from a previously published regional study with permission obtained from the original authors.¹⁰ This study adopts the Knowledge, Attitudes, and Practices (KAP) model as its primary conceptual framework, commonly utilized in literature evaluating public health interventions and premarital screening uptake.^{10,17} For the scope of this research, the framework is adapted to operationalize "Practice" as Willingness to undergo screening.' This modification allows the study to assess the community's behavioral intentions and readiness.¹⁸ The framework suggests that a participant's Knowledge regarding genetic risks and screening benefits may influence their attitudes toward PMS, which may subsequently be associated with their willingness to adopt premarital screening practices.¹⁸

The instrument was translated into Arabic and underwent content validity assessment by experts from the Ministry of Health Research and Studies Centre. The questionnaire comprised four sections: (1) demographic characteristics (age, gender, marital status, educational level, and Wilayat of residence); (2) medical history (personal and family history of genetic diseases); (3) knowledge and awareness (awareness of the national PMS program in Oman and perceived importance); and (4) attitudes and perceptions (willingness toward PMS and agreement with making PMS mandatory).

A pilot study was conducted for 40 participants to ensure clarity and cultural appropriateness. Internal consistency was assessed using Cronbach's alpha based on the final study data. The knowledge domain (five items) demonstrated good reliability (Cronbach's $\alpha = 0.78$), while the attitude domain (three items) showed acceptable reliability (Cronbach's $\alpha = 0.71$), indicating consistent measurement of the intended constructs among the Omani population in South Al-Sharqiyah Governorate.

Knowledge was assessed using five items, with correct responses scored as one and incorrect or "don't know" responses scored as zero. Attitudes toward PMS were evaluated using selected opinion-based items, including participants' level of agreement regarding mandatory PMS, which was measured using a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". Willingness toward PMS was operationally defined as participants' self-reported agreement to undergo screening, assessed using the question "Would you agree to undergo PMS?" For the multivariable logistic regression analysis, responses were categorized into "Willing" (Yes) and "Not willing/Uncertain" (No or "I don't know").

Data were analyzed using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, N.Y., USA). Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize participants' sociodemographic characteristics and attitudes toward PMS. Bivariate associations between categorical variables and willingness toward PMS were analyzed using Chi-square (χ^2) tests.

To identify independent predictors of willingness toward PMS, a multivariable binary logistic regression model was constructed. Variables with a p-value < 0.20 in the univariable analysis, as well as variables identified in previous literature as theoretically relevant, were included in the model. Categorical variables were dummy-coded, with selected reference categories (including age 36–40 years, female sex, married status,

postgraduate education, negative personal and family history of genetic diseases, and the 'I don't know' awareness category as the baseline reference) used for comparison.

Model goodness-of-fit was assessed using the Hosmer–Lemeshow test, while multicollinearity was evaluated using Variance Inflation Factors (VIFs). The Hosmer–Lemeshow test indicated acceptable model fit ($p > 0.05$), and no significant multicollinearity was identified (all VIFs < 2). Results are presented as adjusted odds ratios (aORs) with corresponding 95% confidence intervals (CIs). A p -value ≤ 0.05 was considered statistically significant.

Ethical approval was obtained from the Research and Studies Centre, Muscat, Oman (Ref. no. MoH/CSR/23/27632). Participation was voluntary, and informed consent was obtained; anonymity and confidentiality were maintained.

Results

A total of 583 participants completed the survey, representing multiple regions across South Al Sharqiyah Governorate, with the highest participation from Jalan Bani Bu Ali (38.6%) and Sur (30.7%). Females comprised 74.8% of participants. Most respondents were aged 36–40 years (36.7%), followed by those aged 25–30 and 31–35 years. The majority were married (66.9%), while 28.3% were single, with smaller proportions divorced (2.9%) or engaged (1.2%).

In bivariate analysis, marital status was significantly associated with willingness toward PMS ($p = 0.027$). A higher proportion of married participants expressed willingness to undergo PMS compared with unmarried participants (94.9% vs. 88.5%). Other demographic characteristics, including gender ($p = 0.056$) and educational level ($p = 0.421$), were not significantly associated with willingness (Table 1).

Table 1: Demographic characteristics, consanguinity, genetic disease history, and their associations with willingness toward PMS (n = 583).

Characteristic	Category	n (%)	Willing to undergo PMS n (%)	p-value
Wilayat	Sur	179 (30.7)	170 (95.0)	—
	Jalan Bani Bu Ali	225 (38.6)	210 (93.3)	—
	Jalan Bani Bu Hassan	87 (14.9)	80 (92.0)	—
	Al-Kamil & Al-Wafi	71 (12.2)	65 (91.5)	—
	Masirah	21 (3.6)	17 (81.0)	—
Age group (years)	18–24	103 (17.7)	85 (82.5)	0.009
	25–30	134 (23.0)	125 (93.3)	
	31–35	132 (22.6)	122 (92.4)	
	36–40	214 (36.7)	210 (98.1)	
Gender	Male	147 (25.2)	133 (90.5)	0.056
	Female	436 (74.8)	417 (95.6)	
Marital status	Married	390 (66.9)	370 (94.9)	0.027
	Single	165 (28.3)	146 (88.5)	
	Divorced	17 (2.9)	16 (94.1)	
	Engaged	7 (1.2)	7 (100)	
	Other	4 (0.7)	3 (75.0)	
Educational level	High school or less	195 (33.4)	182 (93.3)	0.421
	Diploma/Bachelor	367 (63.0)	347 (94.6)	
	Postgraduate	21 (3.6)	21 (100)	
Family history of genetic disease	Yes	173 (29.7)	168 (97.1)	0.050
	No	332 (57.0)	305 (91.9)	
	I don't know	78 (13.4)	77 (98.7)	
Personal history of genetic disease	Yes	83 (14.2)	81 (97.6)	0.378
	No	448 (76.8)	418 (93.3)	
	I don't know	52 (8.9)	51 (98.1)	
Parental consanguinity	Yes	305 (52.3)	287 (94.1)	0.121
	No	264 (45.3)	250 (94.7)	
	I don't know	14 (2.4)	13 (92.9)	

"Willing to undergo PMS n (%)" indicates the number and percentage of participants willing to undergo premarital screening. Chi-square test was used to calculate p-values. Wilayat is presented descriptively and not included in inferential analysis. Educational level categories were regrouped to improve statistical stability and reduce sparse cell distribution. **Bold** p-values indicate statistical significance ($p < 0.05$).

Consanguinity among participants' parents was reported by 52.3% of participants, with first-cousin marriages accounting for 28.0%. Family history of genetic disease showed a marginal association with willingness to undergo PMS in univariable analysis ($\chi^2 = 9.509$, $p = 0.050$), whereas personal history of genetic disease was not significantly associated with willingness ($\chi^2 = 4.214$, $p = 0.378$; Table 1).

Approximately two-thirds of participants (63.8%) reported awareness of the national PMS program. Sources of information primarily included media platforms and newspapers (35.3%), followed by family and friends (21.6%). Awareness of the program was significantly associated with willingness toward PMS in bivariate analysis ($\chi^2 = 26.986$, $p < 0.001$; Table 2). Most participants (93.5%) correctly identified that both males and females should undergo PMS. However, fewer recognized that PMS includes both clinical assessment and blood investigations (44.4%) or that it targets both infectious and genetic diseases (64.8%).

Table 2: Knowledge and awareness of PMS and associations with willingness toward PMS (n = 583).

Knowledge and awareness item		Category	n (%)	Willing to undergo PMS n (%)	p-value
Awareness of PMS program		Yes	372 (63.8)	362 (97.3)	<0.001
		No	114 (19.6)	100 (87.7)	
		I don't know	97 (16.6)	88 (90.7)	
Source of information		Media/Newspapers	206 (35.3)	—	—
		Family/Friends	126 (21.6)	—	—
		Health services/school health nurse	88 (15.1)	—	—
		School/University	38 (6.5)	—	—
		Other	37 (6.3)	—	—
Who should be screened		I don't know	88 (15.1)	—	—
		Males	18 (3.1)	—	—
		Females	4 (0.7)	—	—
		Both	545 (93.5)	—	—
		No one	16 (2.7)	—	—
PMS components known		Physical exam	4 (0.7)	—	—
		Blood tests	222 (38.1)	—	—
		Both	259 (44.4)	—	—
		I don't know	98 (16.8)	—	—
Disorders targeted		Genetic	121 (20.8)	—	—
		Infectious	7 (1.2)	—	—
		Both	378 (64.8)	—	—
		I don't know	77 (13.2)	—	—

1. "Willing to undergo PMS n (%)" indicates the number and percentage of participants willing to undergo premarital screening for the knowledge item where applicable. 2. Chi-square test was used to calculate p-values for association with willingness. 3. "—" indicates not analyzed or p-value not applicable. 4. Percentages were calculated based on the total sample size (n = 583). 5. **Bold** p-values indicate statistical significance ($p < 0.05$).

Variables with $p < 0.20$ in univariable analyses, together with theoretically relevant variables, were entered into a multivariable binary logistic regression model (Table 3). Program awareness and younger age remained independent predictors of willingness to undergo PMS (Figure 1). Participants who were aware of the national program had 2.65 times higher odds of willingness to undergo PMS compared with those who were unaware or uncertain (aOR = 2.65; 95% CI: 1.13–6.22; $p = 0.026$). In contrast, participants aged 18–24 years had significantly lower odds of willingness compared with those aged 36–40 years (aOR = 0.32; 95% CI: 0.14–0.76; $p = 0.009$). Gender, marital status, educational level, and history of genetic conditions were not independently associated with willingness in the adjusted model.

Table 3: Predictors of willingness to undergo premarital screening: Multivariable logistic regression (n = 583).

Variable	Category	B	SE	Wald χ^2	p-value	Adjusted OR (95% CI)
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Age group (years)	36–40	<i>Reference</i>	—	—	—	1.00 (Reference)
	18–24	−1.142	0.440	6.739	0.009	0.32 (0.14–0.76)
	25–30	0.078	0.528	0.022	0.882	1.08 (0.38–3.05)
	31–35	0.253	0.527	0.230	0.632	1.29 (0.46–3.62)
Gender	Female	<i>Reference</i>	—	—	—	1.00 (Reference)
	Male	−0.278	0.383	0.528	0.468	0.76 (0.36–1.60)
Marital status	Married	<i>Reference</i>	—	—	—	1.00 (Reference)
	Unmarried (Single)	−0.198	0.412	0.231	0.631	0.82 (0.37–1.84)
	Divorced / Others	−0.084	0.643	0.017	0.896	0.92 (0.26–3.25)
Educational level	Postgraduate	<i>Reference</i>	—	—	—	1.00 (Reference)
	High school or less	−0.624	0.611	1.043	0.307	0.54 (0.16–1.82)
	Diploma/Bachelor	−0.214	0.497	0.185	0.667	0.81 (0.31–2.12)
Personal history of genetic disease	No	<i>Reference</i>	—	—	—	1.00 (Reference)
	Yes	0.348	0.553	0.396	0.529	1.42 (0.48–4.19)
	I don't know	0.349	0.789	0.195	0.659	1.42 (0.30–6.65)
Family history of genetic disease	No	<i>Reference</i>	—	—	—	1.00 (Reference)
	Yes	−0.160	0.517	0.095	0.758	0.85 (0.31–2.35)
	I don't know	0.264	0.614	0.185	0.667	1.30 (0.39–4.34)
Awareness of PMS program in Oman	I don't know	<i>Reference</i>	—	—	—	1.00 (Reference)
	Yes	0.973	0.436	4.969	0.026	2.65 (1.13–6.22)
	No	−0.351	0.443	0.627	0.428	0.70 (0.30–1.68)

1. *B* = regression coefficient; *SE* = standard error; *aOR* = adjusted odds ratio; *CI* = confidence interval. 2. Educational level and marital-status categories were regrouped to improve model stability and avoid sparse cell bias. Engaged and other marital-status categories were merged into broader categories because of small cell counts. 3. Variables included in the model were selected based on univariable analysis and clinical relevance from previous literature. 4. Reference categories are listed at the top of each variable block. All odds ratios are interpreted relative to their respective reference categories. 5. Hosmer–Lemeshow test indicated acceptable model fit ($p > 0.05$), and no evidence of significant multicollinearity was identified (all *VIFs* < 2). 6. **Bold** *p*-values indicate statistical significance ($p < 0.05$).

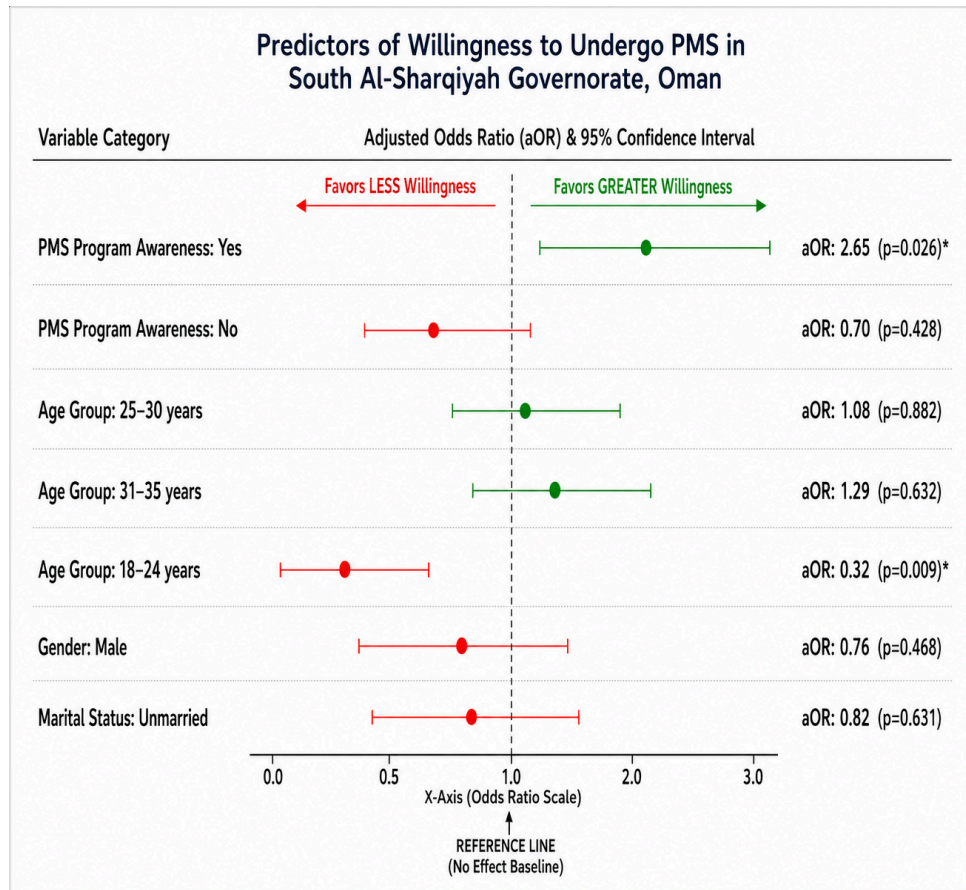


Figure 1: Predictors of willingness to undergo premarital screening in South Al-Sharqiyah Governorate, Oman via multivariable logistic regression (n = 583). Markers to the right of the vertical reference line (1.0) indicate factors favoring greater willingness, while markers to the left indicate lower willingness. Horizontal bars represent the 95% confidence intervals. Asterisks (*) indicate statistical significance ($P \leq 0.05$).

Attitudes toward PMS were generally positive, with 93% of participants expressing willingness to undergo screening and 94.3% considering PMS important (Table 3). Among willing participants, 25.3% (n = 137) reported barriers that could affect decisions after positive screening results, including religious beliefs (39.4%), concerns about marriage continuity (17.5%), and social stigma (11.7%).

Most participants (88.2%) preferred PMS to be conducted before marriage. In the event of genetic risk detection, 36% reported they would cancel the engagement, whereas 47% were uncertain or stated that their decision would depend on the severity of the risk (Table 4). Support for mandatory PMS was reported by 85.8% of participants. No significant differences in attitudes toward mandatory PMS were observed according to gender ($t = -0.927$, $p = 0.354$), age group ($F = 0.662$, $p = 0.576$), or educational level ($F = 1.009$, $p = 0.402$).

Table 4: Attitudes and perceptions toward PMS and agreement with mandatory screening (n = 583).

Domain	Item / Category	n (%) / Mean $\pm$ SD	Statistical test	p-value
General attitude	PMS is important	Yes: 550 (94.3); No: 15 (2.6); I don't know: 18 (3.1)	—	—
	Would agree to undergo PMS	Yes: 542 (93.0); No: 20 (3.4); I don't know: 21 (3.6)	—	—
Perceived barriers influencing screening decisions (n = 137)	God's will	54 (39.4)	—	—
	Concerns regarding marriage continuity	24 (17.5)	—	—
	Social stigma	16 (11.7)	—	—
	Other	43 (31.4)	—	—
Timing of PMS	High school	38 (6.5)	—	—
	After marriage	2 (0.3)	—	—

Response if children could be affected	Before marriage	514 (88.2)	—	—
	I don't know	29 (5.0)	—	—
	Continue engagement/marriage	83 (14.0)	—	—
	Proceed due to family pressure	5 (1.0)	—	—
	Proceed due to emotional reasons	11 (2.0)	—	—
	Cancel engagement	210 (36.0)	—	—
	I don't know	145 (25.0)	—	—
	Decision depends on the level of genetic risk	129 (22.0)	—	—
	Overall score (1–5)	Male: 4.37 ± 0.89 Female: 4.45 ± 0.88	Independent t-test	0.354
	Age group	—	One-way ANOVA	0.576
Agreement with mandatory PMS Comparison across age and education	Education level	—	One-way ANOVA	0.402

1. Categorical variables are presented as n (%), and continuous variables as mean ± standard deviation (SD). 2. Independent t-test for male vs female mean scores. 3. One-way ANOVA for age and education comparison. 4. Agreement scale ranged from 1 (strongly disagree) to 5 (strongly agree).

Discussion

Our study demonstrated a high level of acceptance of PMS among adults in South Al-Sharqiyah governorate, Oman. Most participants reported willingness to undergo screening and perceived PMS as an important component of marriage preparation. This may reflect the established integration of PMS within the national health system since its introduction in 2004 as part of routine premarital healthcare practice.

The observed acceptance of PMS is consistent with findings from other GCC countries, where sustained governmental commitment and long-standing public health initiatives have contributed to the widespread acceptance of PMS.¹ Studies from Saudi Arabia, Bahrain, and Kuwait similarly report high levels of awareness and acceptance.^{7,16,17} These regional similarities suggest that PMS has become an established component of marital preparation across many GCC countries.^{7,12,18} Collectively, these findings may reflect the influence of both national health strategies and shared sociocultural values in shaping public attitudes toward PMS.

The high prevalence of consanguinity identified in this study may further contribute to public support for PMS, as communities with traditional marriage patterns are often more aware of the impact of hereditary conditions within families. This may partly explain why mandatory screening was generally perceived as a preventive public health measure rather than a challenge to cultural practices. Overall, the findings suggest substantial community readiness for the transition to mandatory PMS implementation in Oman.

The absence of significant associations between willingness to undergo PMS and demographic factors such as gender, educational level, and personal history of genetic disease indicates broad acceptance across different population subgroups. Although family history of genetic disease demonstrated a marginal association in the univariable analysis, this relationship did not remain significant after multivariable adjustment. Similarly, marital status showed an association with willingness in the univariable analysis but did not emerge as an independent predictor in the adjusted model, suggesting that the observed association may have been influenced by other factors, including age and program awareness.

These findings align with previous studies reporting that once PMS is integrated within national health systems, demographic differences in acceptance tend to diminish as screening becomes socially normalized.^{13,16} Our results support this evidence, suggesting that Oman's PMS program has achieved a similar level of social integration.

In contrast, younger age emerged as a significant predictor of willingness to undergo PMS. Participants aged 18–24 years being less likely to express willingness compared with those aged 36–40 years. This finding differs from reports in other Gulf countries, where younger individuals have sometimes demonstrated greater

receptiveness to PMS.⁵ The observed difference in South Al-Sharqiyah may be related to variations in exposure to premarital health education or differences in how young adults perceive the relevance of screening when marriage is not immediately anticipated, highlighting a critical gap in early preventive engagement among younger populations.

The reduced willingness observed among younger participants highlights the need for age-specific interventions. Younger individuals may underestimate genetic risks and perceive themselves as low risk.^{6,15,18} Furthermore, although the 2026 transition to a mandatory framework is expected to improve uptake through legal enforcement, there remains a risk that, without targeted education, younger adults may perceive PMS primarily as a procedural requirement rather than a preventive health measure.

In addition, reliance on social media as a major source of health information may contribute to misconceptions regarding genetic screening and its purpose. These findings suggest that awareness alone may not be sufficient; tailored communication strategies and school-based education are needed to effectively engage younger populations and shift perception of PMS from a legal obligation to a vital preventive health practice.

Awareness of the national PMS program emerged as a significant independent predictor of willingness, consistent with regional and international studies highlighting knowledge as a key determinant of screening uptake. Studies from Saudi Arabia, Qatar, and Jordan similarly report high levels of awareness and positive attitudes toward PMS, with acceptance and support associated with better understanding of its purpose and implications.¹⁹⁻²¹ Our findings reinforce the importance of sustained public education and effective risk communication in maintaining and improving PMS uptake in Oman.

Despite overall high acceptance of premarital screening, conditional willingness was evident. Participants cited religious beliefs, concerns about marital continuity, and social stigma as potential barriers, and responses to hypothetical genetic risk scenarios varied. These findings are consistent with regional research showing that positive attitudes toward screening do not always translate into uniform decision-making, and that cultural values and perceptions of risk to future children influence responses to screening outcomes.^{13,20}

Support for mandatory PMS was strong, with substantial agreement reported across different population segments, reflecting broad societal endorsement of PMS.²² This suggests trust in the health system and recognition of the collective benefits of screening, while also highlighting the importance of ensuring ethical implementation and culturally sensitive counseling services.

Overall, this study contributes new evidence from Oman, suggesting the maturity of the national PMS program while identifying key areas for improvement. The central role of awareness and the reduced engagement among younger adults highlight the importance of targeted, culturally appropriate, and youth-focused health communication strategies to sustain and strengthen PMS uptake.

Findings suggest that enhancing PMS uptake may benefit from targeted youth-focused awareness initiatives and strengthened educational outreach in schools and universities. Digital health platforms may also provide opportunities to address misconceptions and improve risk perception among younger populations, consistent with evidence from adolescent studies.²³ Strengthening premarital counseling services and culturally sensitive communication may further support informed decision-making. In addition, following the implementation of mandatory PMS, further analytical research investigating age-specific uptake of PMS is essential to be conducted.

This study has several limitations. First, the use of convenience sampling via social media (WhatsApp) may have introduced selection bias, potentially overrepresenting individuals with higher digital literacy and social engagement. This is reflected in the relatively higher proportion of female and older participants in the sample. Although this digital approach allowed for broad geographic coverage across the five wilayats, it limits the generalizability of the findings to the wider Omani population.

Second, the self-reported nature of the data may be subject to social desirability bias, whereby participants may over-report positive attitudes toward screening. In addition, the cross-sectional design allows for the identification of associations but does not permit causal inferences between the identified determinants and willingness.

Third, non-response bias may be present, as individuals who chose not to participate or did not complete the questionnaire may differ systematically in their awareness or attitudes toward premarital screening compared with respondents. Finally, although the study assessed behavioral intention (willingness), stated intention may not always translate into actual behavior in clinical practice.

Conclusion

This study demonstrates a high level of acceptance and willingness to undergo PMS among adults in South Al-Sharqiyah Governorate, reflecting strong societal endorsement of PMS as a preventive public health measure. Awareness of the national PMS program emerged as the most influential determinant of willingness, underscoring the critical role of health education and effective communication in promoting screening uptake. In contrast, lower willingness observed among younger adults highlights a significant engagement gap that necessitates targeted, age-specific interventions.

The absence of significant associations between willingness and gender, educational level, or medical history suggests that PMS has become a socially normalized expectation across demographic groups in Oman. These findings indicate that efforts to sustain and enhance PMS uptake should focus on youth-oriented awareness strategies, integrating PMS education into school and university curricula, and strengthening premarital counseling services. Collectively, this study contributes valuable evidence to the regional and international literature on preventive genetic screening and offers context-specific insights to inform the continued optimization of PMS programs in Oman and similar settings.

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