

## A CROSS-SECTIONAL STUDY OF PUBLIC KNOWLEDGE AND ATTITUDES REGARDING VITILIGO

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## Abstract

**Background:** Vitiligo is a long-term autoimmune condition affecting up to 2% of the global population, characterized by skin depigmentation. Its visible nature often leads to social stigma, significantly impacting the psychological well-being and quality of life of those affected. Limited public understanding of the disease contributes to this stigma.

**Methods:** This study was conducted with 1000 participants to evaluate public knowledge and attitudes toward vitiligo. The survey comprised four sections: sociodemographic data, exposure to vitiligo, knowledge assessment, and attitudes toward the condition. Knowledge and attitudes were scored and categorized into levels. Statistical analyses examined the influence of sociodemographic factors and exposure to vitiligo on these scores.

**Results:** The mean knowledge score was  $8.72 \pm 2.46$ , and 67.1% of participants exhibited moderate knowledge. Attitudes were predominantly positive, with a mean score of  $4.41 \pm 3.12$ , and only 13.2% had negative attitudes. Younger participants, women, and health-related professionals demonstrated higher scores for both knowledge and attitudes. Prior exposure to vitiligo was significantly associated with improved scores. Sources of information impacted attitudes, with physician-provided knowledge fostering more positive perceptions.

**Conclusion:** The findings highlight good public knowledge of vitiligo, though misconceptions persist, particularly about its autoimmune and non-communicable nature. Positive attitudes were correlated with higher knowledge levels, emphasizing the importance of public education initiatives led by healthcare professionals. Targeted awareness campaigns and reliable online resources are recommended to address misconceptions and reduce stigma.

## Introduction

Vitiligo is a long-term autoimmune condition that affects up to 2% of the global population (1). The autoimmune

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nature of this disease leads to the depigmentation of certain areas of the skin, creating noticeable contrast against otherwise normal skin. Vitiligo can occur in individuals of any age or gender without a clear predilection (1, 2). Skin conditions, due to their visible nature, often carry significant stigma, and vitiligo is no exception (3). Research has highlighted the profound negative impact of vitiligo on patients' quality of life (QoL), with one study indicating severe QoL impairment in patients (4). The extent of this impact has even been compared to that experienced by individuals with cancer (5). Psychological issues such as anxiety and depression are commonly linked to the decline in QoL among people with vitiligo (6, 7).

A study conducted on individuals with vitiligo reported that 72% experienced mild or minimal depression, while 28% and 39.8% faced moderate-to-severe levels of depression and anxiety, respectively (8). Additionally, a meta-analysis including 15 studies with 1,176 vitiligo patients found a general anxiety prevalence of 35.8% (9). Public perceptions and societal attitudes toward the condition significantly influence the psychological well-being of those affected. One investigation revealed that a large proportion of patients had been questioned or approached about their condition, with many experiencing unpleasant comments. Furthermore, behaviors such as avoidance or attempting to conceal the depigmented areas were frequently reported (10).

Misconceptions about vitiligo are widespread and vary. Some beliefs link the condition to dietary factors, nutritional deficiencies, or infectious causes, while others suggest a connection to myths like witchcraft or evil forces (11, 14). While some studies have demonstrated sufficient public knowledge of vitiligo among certain populations (12), others have shown limited awareness (13). Overall, greater understanding of the disease is often associated with more positive attitudes toward those affected (15, 16).

Given the limited research assessing public knowledge and attitudes regarding vitiligo in some regions, this study sought to address this gap. By exploring these aspects and examining the factors that influence them, the research aims to highlight areas of misunderstanding and sources of stigma, ultimately contributing to strategies for improving the quality of life of individuals with vitiligo.

## Methods

This research employed a self-administered online survey, completed by 1000 participants from a general population sample. The survey was developed by a dermatologist in collaboration with statisticians, with data collection occurring.

The survey consisted of four distinct sections. The first section collected sociodemographic data, including age, gender, education level, marital status, geographic location, household income, employment status, and whether participants worked in a health-related field.

The second section explored prior exposure to vitiligo through four questions: whether participants had heard of the condition, were personally diagnosed with it, had a partner diagnosed with it, or lived with someone who had the condition. The third section assessed knowledge of vitiligo through 14 questions answered with "Yes," "Maybe," or "No." Topics covered included whether vitiligo is contagious, hereditary, autoimmune, related to hygiene, systemic, food-related, lethal, or influenced by psychological stress or witchcraft.

The final section measured participants' attitudes toward vitiligo through eight statements, addressing scenarios such as sharing meals, forming friendships, shaking hands, hiring practices, and intimate relationships. Knowledge and attitude questions were adapted from previous research (12, 15). In the knowledge section, one point was awarded for correct answers, while incorrect or "Maybe" responses received zero points. For the attitude section, responses were scored as follows: "Yes" (+1), "Maybe" (0), and "No" (-1). Total scores for knowledge and attitudes were calculated per participant, and respondents were categorized into low (0-5), moderate (6-10), or high (11-14) knowledge groups. Attitudes were classified as positive (1-8) or negative (-8-0).

Using the Raosoft sample size calculator, the minimum sample size was determined to be 372, based on a population size of 10,000,000, a 5% margin of error, a 95% confidence interval, and a response distribution of 50%. A pilot study of 45 participants was conducted prior to data collection to ensure the questionnaire's validity. Minor adjustments were made, such as consolidating education levels of high school or less into a single category. The questionnaire was subsequently disseminated via social media platforms, including WhatsApp, Instagram, Twitter, and Facebook. Participants completed the survey anonymously, ensuring privacy, and consent was obtained through a confirmation page at the start of the survey.

## Data Analysis

Data collected through the online survey were imported into an Excel spreadsheet and then analyzed using R software (17) and RStudio (18). The readxl package facilitated data import (19), while packages such as tidyverse for data manipulation (20), ggplot2 and ggpvr for visualization (21, 22), rstatix for inferential statistics (23), and apaTables for regression tables (24) were utilized.

Descriptive statistics were performed to summarize counts and percentages for each variable. The Shapiro Wilk test assessed the normality of continuous variables (knowledge and attitude scores). Consequently, the Mann–Whitney U test and Kruskal–Wallis test were employed to examine associations between sociodemographic factors, prior exposure to vitiligo, and the scores for knowledge and attitudes. Finally, multiple linear regression was performed to identify independent predictors of knowledge and attitude outcomes.

Results

A total of 1000 individuals completed the self-administered online questionnaire, and their data were included in the current analysis. The mean knowledge score across the sample was  $8.72 \pm 2.46$ , while the mean attitude score was  $4.41 \pm 3.12$ . Among the participants, 67.1% had moderate knowledge, and 23.9% exhibited high knowledge about vitiligo. Negative attitude scores were observed in only 13.2% of the participants.

Approximately 60.3% of the respondents were aged 16–30 years, with this group showing significantly higher attitude scores compared to older groups ( $p < 0.001$ ,  $\eta^2 = 0.102$ ). Women comprised 63.8% of the sample and demonstrated significantly higher knowledge scores than men ( $p < 0.001$ , Cohen's  $d = 0.15$ ). Geographic distribution showed no significant effect on knowledge scores; however, significant differences were noted in attitude scores ( $p < 0.001$ ,  $\eta^2 = 0.029$ ), with urban participants scoring higher compared to their rural counterparts (Table 1), (Figure 1-3),

Participants were categorized into three levels of knowledge: low (8.4%), moderate (67.1%), and high (23.9%). Marital status, with proportions of 41.2% married and 58.8% single, revealed no significant effect on knowledge scores ( $p = 0.081$ , Cohen's  $d = 0.003$ ). However, single participants showed significantly higher attitude scores compared to married participants ( $p < 0.001$ , Cohen's  $d = 0.075$ ).

Significant differences in attitude scores were also observed in relation to employment status ( $p < 0.001$ ,  $\eta^2 = 0.051$ ), with students scoring higher on attitudes compared to employed or unemployed groups. Similarly, health-related professionals reported higher scores for both knowledge ( $p < 0.001$ ,  $\eta^2 = 0.167$ ) and attitudes ( $p < 0.001$ ,  $\eta^2 = 0.121$ ) than non-health professionals.

In summary, the findings indicate that sociodemographic variables such as

age, gender, and professional background significantly influence participants' knowledge and attitudes toward vitiligo, emphasizing the importance of targeted awareness campaigns.

most respondents held a bachelor's degree or diploma (66.59%), while the education levels of their fathers and mothers were primarily high school or below (42.76% and 48.01%, respectively). The analysis revealed that personal education level significantly influenced knowledge and attitude scores ( $p < 0.001$ ,  $\eta^2 = 0.015$ ;  $p = 0.034$ ,  $\eta^2 = 0.005$ , respectively). Post hoc comparisons highlighted that individual with high school or less education exhibited lower knowledge scores compared to others. Conversely, participants with bachelor's degrees or diplomas (either personal or maternal) displayed more favorable attitudes compared to those with higher education ( $p < 0.05$ ). Additionally, fathers with higher education were associated with more positive attitudes than those in other educational categories ( $p < 0.001$ ) (Figure 4-6).

Among respondents, 93.45% had heard of vitiligo, and 2.34% reported being affected by it. prior exposure to vitiligo was associated with higher knowledge scores ( $p < 0.05$ ), while a more positive attitude was observed in those who had heard of the condition or lived with a vitiligo patient ( $p < 0.05$ ) (Figure 7).

The majority of participants gained knowledge about vitiligo from family and friends (33.55%) and internet/social media platforms (27.11%). Statistical testing indicated that attitude scores varied significantly with the source of knowledge ( $p = 0.006$ ,  $\eta^2 = 0.013$ ). Specifically, individuals who learned about vitiligo from physicians exhibited more positive attitudes compared to those who relied on television ( $p < 0.05$ ). Knowledge scores did not significantly differ across sources.

Discussion

Vitiligo, an autoimmune disorder characterized by depigmentation, is estimated to affect up to 2% of the population (1). Although some may view it as a purely cosmetic condition, the psychological and social challenges faced by individuals with vitiligo must not be overlooked (25, 26). Research consistently highlights that visible skin conditions carry a significant stigma (3), underscoring the importance of understanding public perceptions and attitudes toward these conditions. This study sought to assess public knowledge and attitudes regarding vitiligo, while also examining how sociodemographic factors and prior exposure to the condition influence these perceptions. These insights

Table 1. Participant characteristics and their corresponding knowledge and attitude scores (n = 856).

Variable	n	%	Knowledge Scores	SD	p-Value	Attitude Scores	Mean	SD
Age group (years)			Mean			Effect Size		
16–30	516	60.3	8.57	2.52	0.124	0.004	5.24	2.89
31–50	296	34.6	8.94	2.37			3.48	3.32
>50	44	5.1	9.01	2.12			2.74	3.54
Sex								
Male	310	36.2	8.34	2.89	<0.001	0.15	4.21	3.31
Female	546	63.8	9.01	2.15			4.59	3.08
Income level								
Low (<600)	354	41.4	8.42	2.43	<0.001	0.022	3.87	3.39
Moderate (600–1200)	286	33.4	8.93	2.35			4.64	3.15
High (>1200)	216	25.2	9.05	2.68			5.18	2.92

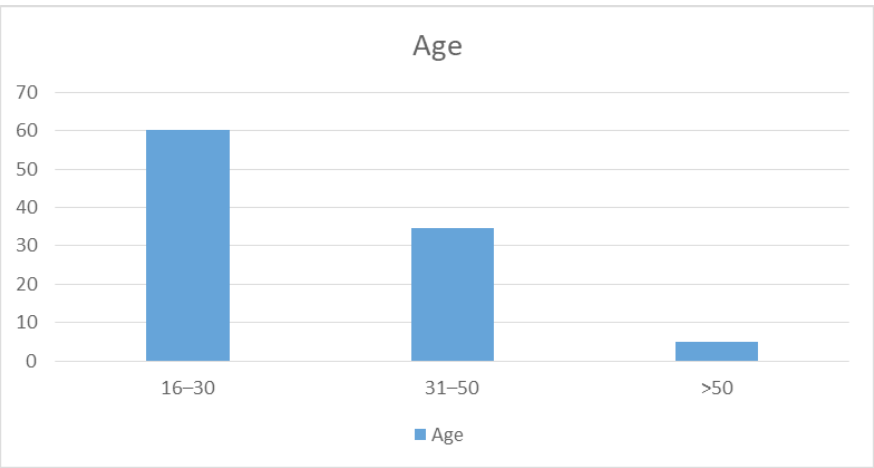


Figure 1. Age.

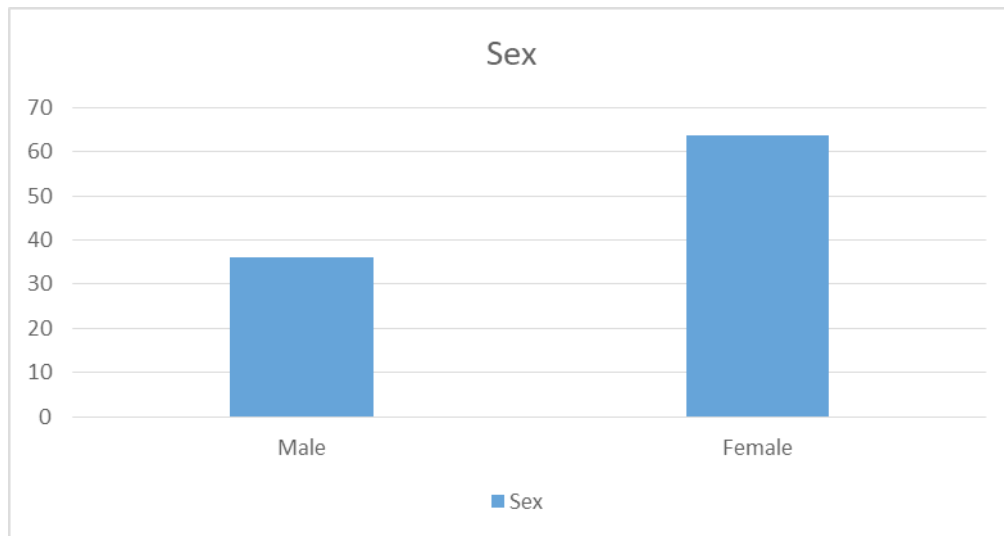


Figure 2. Sex.

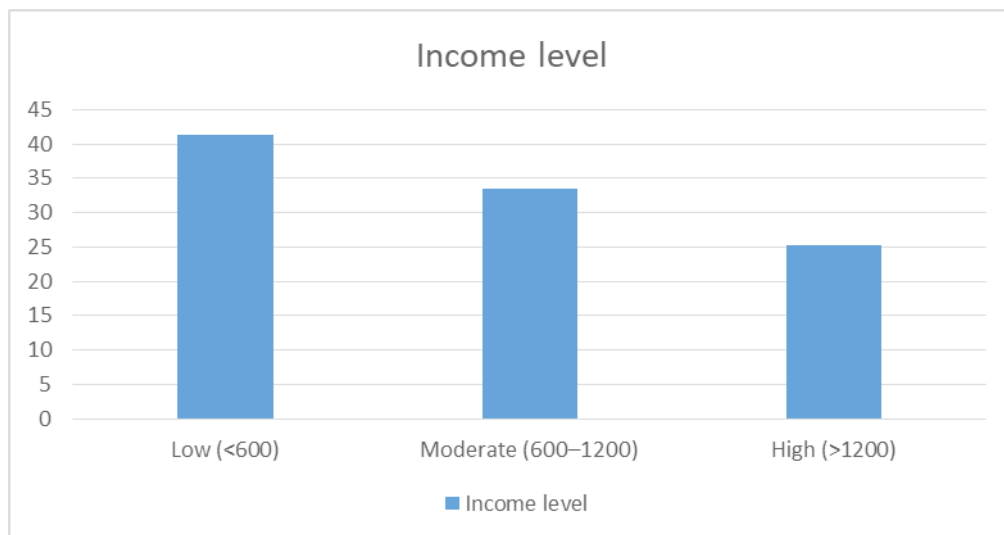


Figure 3. Income level.

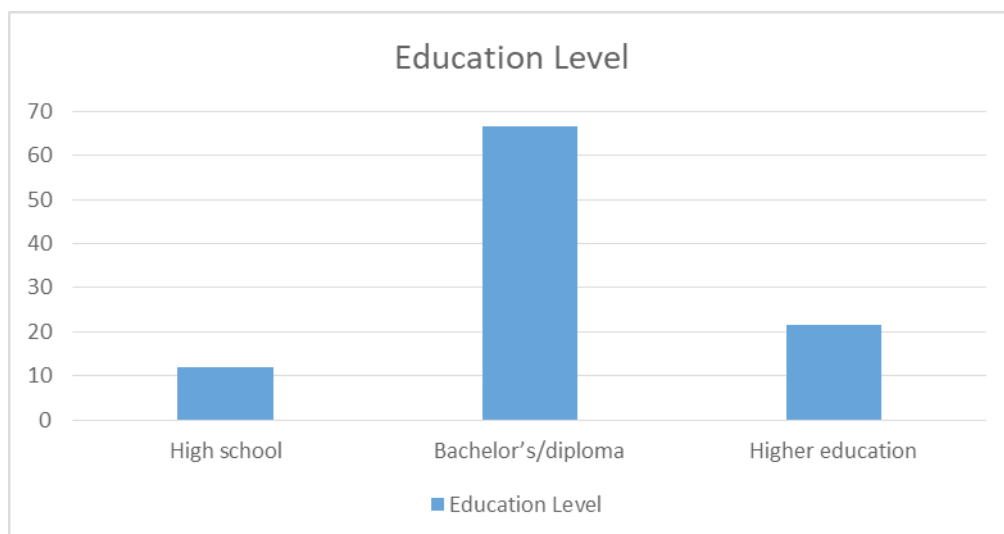


Figure 4. Education Level.

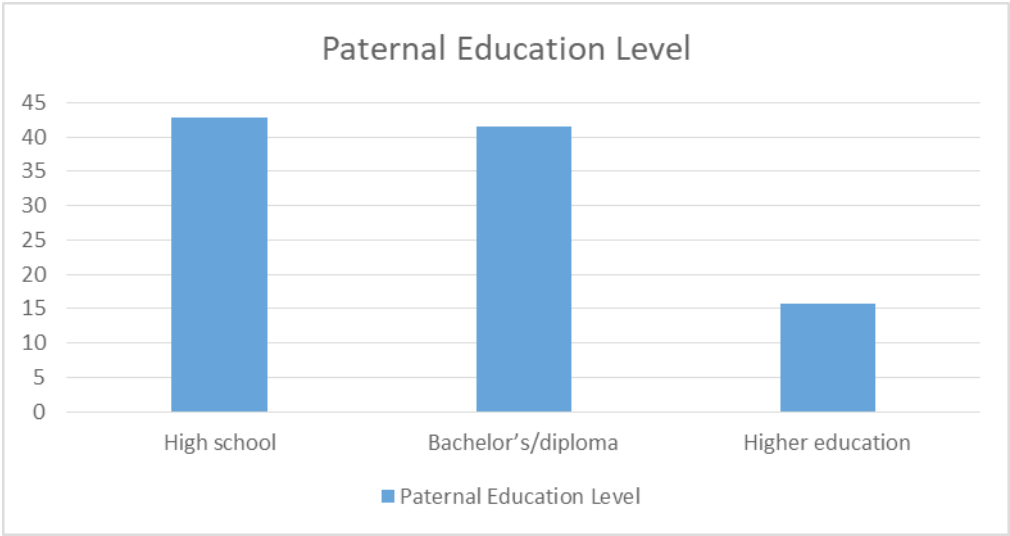


Figure 5. Paternal Education Level.

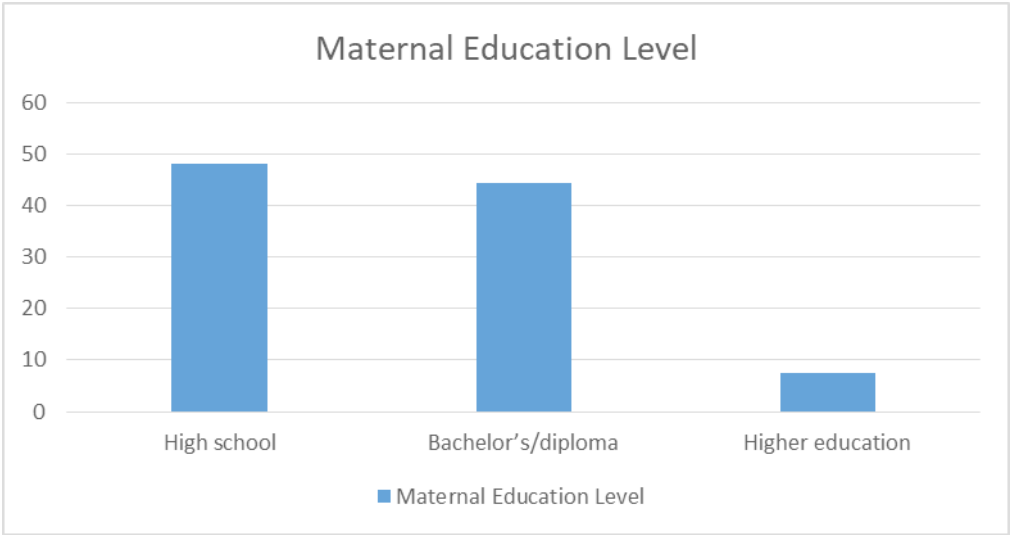


Figure 6. Maternal Education Level.

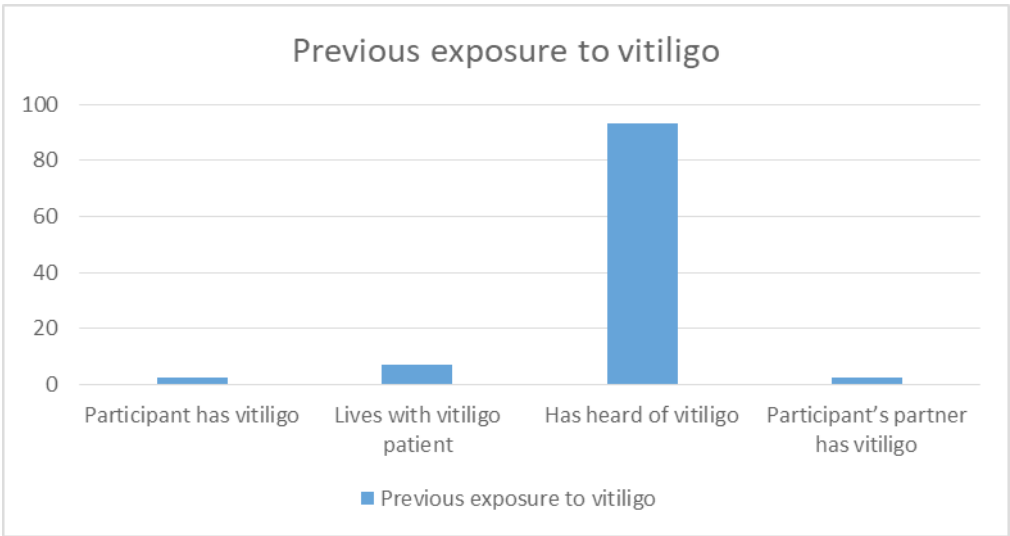


Figure 7. Previous exposure to vitiligo.

are critical for developing targeted interventions to address misconceptions and improve the quality of life for individuals with vitiligo.

The study included 1000 respondents who completed an online questionnaire. Participants predominantly comprised women (63.8%) and individuals aged 16–30 (60.3%), both of whom demonstrated higher scores in knowledge and attitude measures. These findings suggest a need for broader representation in future research, as the sample may not fully reflect the diversity of the population.

Overall, 93.45% of participants were aware of vitiligo, and only 8.4% demonstrated low knowledge scores. These results indicate a generally good understanding of the condition, aligning with findings from similar studies in other regions (12, 15, 28). However, some misconceptions persisted, particularly regarding the autoimmune nature of vitiligo and its non-contagious nature. For instance, 13.28% of respondents believed that vitiligo could be contagious, which may contribute to social stigma against individuals with the condition. Additionally, over a third (37.32%) of participants did not recognize the role of psychological stress in exacerbating vitiligo, despite evidence linking stress to disease progression (29).

Interestingly, family and friends were the primary sources of information about vitiligo (33.55%), followed by social media (27.11%). Participants who acquired knowledge from healthcare professionals, such as physicians, displayed significantly more positive attitudes compared to those relying on other sources like television. This underscores the critical role of accurate and reliable information dissemination by healthcare providers. Social media, while widely used, has been associated with variable quality and accuracy of health-related content (33, 34). Therefore, improving the quality and credibility of online resources about vitiligo is essential.

Attitude scores were reassuringly positive overall, with only 13.2% of participants displaying negative attitudes. Younger individuals demonstrated significantly more favorable attitudes, which aligns with other research findings (12, 35) and suggests that younger generations may be more empathetic and accepting toward individuals with visible conditions. However, concerning patterns emerged, as some respondents expressed reluctance to engage in intimate relationships with individuals affected by vitiligo. For example, 35.92% indicated they would not marry a person with vitiligo, and smaller proportions acknowledged the potential for the condition to affect relationships. These findings highlight the persistent social challenges faced by individuals with vitiligo and underscore the need for continued public education.

Knowledge and attitude scores were significantly correlated, suggesting that greater awareness may foster more positive perceptions. Notably, education level influenced these scores; individuals with a high school education or less had lower knowledge scores but more positive attitudes compared to those with higher education. This contrasts with findings from other studies, where higher educational attainment was generally associated with more positive attitudes (8).

This study highlights the importance of addressing public misconceptions about vitiligo through targeted awareness campaigns. Incorporating information about vitiligo into school curricula and leveraging healthcare professionals to lead public education initiatives could improve understanding and reduce stigma. Moreover, increasing the availability of high-quality, accessible online content about vitiligo is essential to counter misinformation and promote positive attitudes.

### Conclusions

Despite generally good knowledge about vitiligo among participants, certain misconceptions persist, particularly regarding its autoimmune and non-communicable nature. Higher knowledge levels were associated with more positive attitudes, emphasizing the importance of accurate information dissemination. Targeted awareness campaigns led by healthcare professionals and the development of reliable online content are recommended to enhance public understanding and reduce stigma associated with vitiligo.

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