# Knowledge toward Vitiligo in General Population

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**Abstract**

Vitiligo is a common autoimmune disfiguring skin disorder where white patches appear on the skin. This results in an impairment of the quality of life (QoL) and psychological morbidities for vitiligo patients. Unfortunately, there is a prevalent misconception about vitiligo disease nature all over the world. This study aims to evaluate knowledge toward vitiligo in the general population and to investigate whether knowledge toward vitiligo differs between ethnic groups. A cross-sectional survey in the form of a self-administered electronic questionnaire on the researcher's tablet given to the general population attending at Bumrungrad International Hospital in Thailand. A total of 158 subjects completed the questionnaire (26 Caucasians, 97 Asians, 35 Arabians). Overall, the average knowledge score was 7±3.4 out of 15, with a significant difference between the groups (p=0.017). Only 23% of the participants knew that the condition in the video was vitiligo. Arabians were significantly more likely than the other groups to know the name of vitiligo disease (p=0.001). Nearly about one-fourth of the subjects had knowledge regarding the disease etiology as an immunological, hereditary disease that can be triggered by psychological stress. Moreover, less than 40% of the participants realized that it is a treatable disease with unknown etiology and without an internal organ abnormality. However, more than 70% of them knew that this condition was not contagious by touching, having a meal together or by airborne transmission. In conclusion, this study showed misconceptions about vitiligo disease in the general population.

***Keywords:*** *Knowledge, vitiligo*

## 1. Introduction

Vitiligo is a common skin disorder in which white patches appear on the skin. The disease can appear at any time during life, however, it frequently occurs before 20 years of age. Most patients with vitiligo attribute the onset of their disease to specific life events physical injury, sunburn, emotional stress, illness, or pregnancy (X. J. Zhang et al, 2004).

It occurs in all skin types with equal prevalence between man and woman (Kyriakis, Palamaras, Tsele, Michailides, & Terzoudi, 2009). In spite of this, women tend to suffer more than men (Gawkrodger et al, 2008) as they are more likely to seek treatment because of their cosmetic appearance. The cause of the disease is still unknown, however, the autoimmune theory with underlying genetic predisposition is the most evident theory (Alikhan, Felsten, Daly, & Petronic-Rosic, 2011).

Vitiligo disease has a worldwide prevalence ranging from 0.5% to 2% (Bergqvist & Ezzedine, 2020). However, according to a meta-analysis study about the prevalence of vitiligo disease around the world they mentioned that there is a discrepancy of the disease's prevalence which may be due to different skin types and ethnic groups (Y. Zhang et al, 2016). For instance, the prevalence in the Asian population varies among countries depending on the geographical distribution. The prevalence of the disease is low in Shaanxi Province, China as reported 0.093% compared to India which was high as 8.8% (Bergqvist & Ezzedine, 2020). In addition, a study was conducted among 201 Korean vitiligo patients revealed that skin type II was significantly less frequent than skin type IV in vitiligo patients compared with normal controls (Ahn, Lim, Kim, Kim, & Park, 2000). Therefore, it seems likely that the skin type may indeed play a role in the disease prevalence among different ethnic groups.

The disease is more disfiguring in darker skin type and drawing undue attention (Kent & al-Abadie, 1996) leading to impaired QoL and psychological comorbidities for the patients such as depression, suicidal thoughts and suicidal attempts (Ongenae, Beelaert, van Geel, & Naeyaert, 2006; Vallerand et al, 2019).

Moreover, Sarkar et al. assessed psychiatric morbidity among vitiligo patients in a tertiary-based care center in India by using a self-reporting questionnaire-24 (SRQ24). The psychiatric morbidity in the study group was 63.93%, compared with 24.59% in the control group ($P$<0.0001). Acral vitiligo had a maximum association with psychiatric morbidity (86.67%) followed by vitiligo vulgaris (68%), mucosal vitiligo (62.5%) and others (Sarkar, Sarkar, Sarkar, & Das, 2018).

In 2015, Silverberg et al. (Silverberg & Silverberg, 2015) conducted a large-scale questionnaire-based study involving 1541 adult vitiligo patients to evaluate the impact of stressful triggers among vitiligo patients. The result was that about 56.6% experienced at least one death or stressor within 2 years before vitiligo onset, including death of beloved one (16.6%) and stressful life events (51.0%), especially work or financial problems(10.8%), end of a long-term relationship (10.2%) and family problems (7.8%).

In 2019, Vallerand et al. (Vallerand et al, 2019) reported a bidirectional relationship between vitiligo and major depressive disorder (MDD) by using cohort study and they pointed out that clinicians treating vitiligo patients should be aware of this bidirectional relationship and to refer the vitiligo patients for mental health services accordingly. they found that patients with MDD had 64%increased risks for vitiligo diagnosis compared with people without MDD.

The psychological intervention for vitiligo patients is very important to address the psychological difficulties that vitiligo patients faced and, it can lead to a significant reduction in self-reported anxiety, depression, appearance-related concerns and changes in coping styles. Although the importance of this psychological intervention for vitiligo patients, A Cochrane review of interventions for vitiligo patients identified only one randomized controlled trial (RCT) that compared cognitive-behavioral therapy (CBT) with controls (Whitton et al, 2016).

Unfortunately, in many societies, there is a misunderstanding about vitiligo and is believed to be a sign of leprosy or sexually transmitted disease where female patients have difficulty getting married (Dolatshahi, Ghazi, Feizy, & Hemami, 2008; Gawkrodger et al, 2008) and finding educational and vocational opportunities (Borimnejad, Parsa Yekta, Nikbakht-Nasrabadi, & Firooz, 2006). Previous studies conducted in Saudi Arabia, India and Thailand revealed the misconception and wrong thoughts about vitiligo disease among Arabic and Asian populations (Alghamdi et al, 2012; Asati et al, 2016; Fatani et al, 2016; Juntongjin, Rachawong, & Nuallaong, 2018). However, vitiligo was obviously more misunderstood among Asians in Thailand in the study conducted by Juntongjin et al. (Juntongjin et al, 2018) who attributed the difference in the findings to the difference in the methodology as they allowed the participants to watch a brief video showing a vitiligo patient then asking questions about the person in the video instead of asking directly about vitiligo disease.

## 2. Objectives

This study aims to evaluate knowledge toward vitiligo in the general population and to investigate whether knowledge toward vitiligo differs between ethnic groups.

## 3. Materials and Methods

A cross-sectional survey study in the form of a self-administered electronic questionnaire on the researcher's tablet was conducted among the general people attending at Bumrungrad International Hospital. The survey questionnaire has 4 main categories: the informed consent part, the personal information part, watching a brief video (20 sec) and the knowledge questions part (15 questions). The video portrayed a customer being served at a restaurant by a waitress with visible white patches on both hands. The last scene of the video was paused on the hands in order to clearly display and visually embed the image of the hands to the participants of the study as the last impression. The questionnaire and the video was taken with permission from the previous study conducted by Juntongjin et al. (Juntongjin et al,



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2018). Then, the questionnaire and consents were translated into 5 languages (English, Thai, Chinese, Burmese and Arabic) according to the translation guidelines. Each of the questions presented three possible answers: “Yes”, “No” and “Not sure”. Total knowledge scores ranged from zero to 15.

Once, the approval from Ethics committee at Bumrungrad International Hospital and Research committee was obtained, the participants were randomly selected from the skin center and check-up clinic at Bumrungrad International Hospital. All participants chose their appropriate language version regarding to their understanding, then they have signed the informed consent. A knowledge information sheet about vitiligo disease was given to the participants after filling out the questionnaire in order to correct the participant's misconception about the disease.

SPSS version 21 was used for statistical analysis. Data were expressed as number and percentage for categorical variables, and as average with standard deviation for continuous variables. Categorical data were evaluated by the $X^2$ test and continuous data were analyzed by one-way ANOVA.

**4. Results and Discussion**

A total of 165 participants was asked to fill out the survey questionnaire and 4 declined. Thus, total of 161 responses was recorded (3 responses were excluded as vitiligo patients). Of the remaining total, 158 responses were analyzed and included in the study (26 (16%) Caucasians, 97 (61%) Asians, 35 (22%) Arabians) as shown in Figure 1.

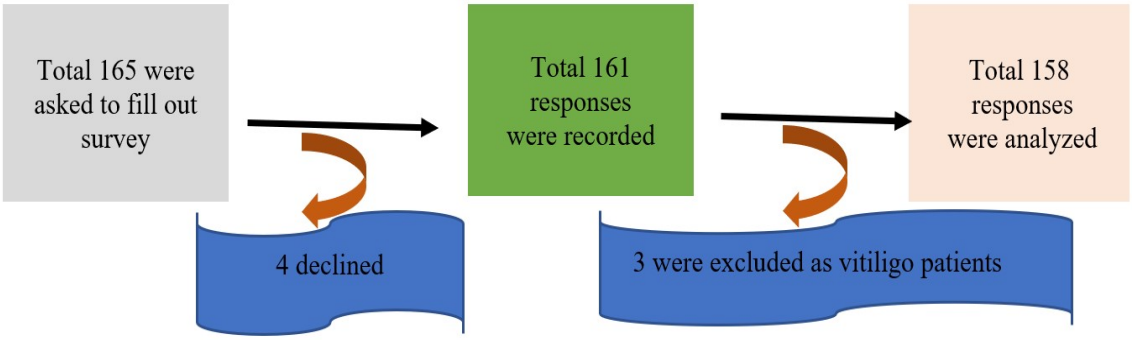


**Figure 1** Number of the participants involved in the study

Male was around 61.4% of all participants. The total average age was 41.71 ±12.6 and Caucasians were elder than Asians and Arabians. Most of the subjects were Buddhist (37%), followed by Muslim (32%). Nearly 60% of the subjects were married. The majority of the participants had an education higher than high school level with total family income was more than 100K baht per month. The basic characteristics of the participants were shown in Table 1.

| | Caucasian (n = 26) | Asian (n = 97) | Arabian (n = 35) | Total (n = 158) | P value* |
|---|---|---|---|---|---|
| Male: Female | 22:4 | 54:43 | 21:14 | 97:61 | 0.026* |
| Age (Mean ± SD) | 50.96±15.8 | 39.91±11.5 | 39.83±10.7 | 41.71±12.6 | <0.0001* |
| Nationality(country) | USA38.5%<br>UK 15.4%<br>Others 46% | Thailand 42%<br>Myanmar 14%<br>Others 43% | UAE 48.6%<br>Qatar 20%<br>Others 31% | | |
| Religion | | | | | |
| ☐ Buddhist | 1 (3.8%) | 58 (59.8%) | 0 | 59 (37%) | <0.0001* |
| ☐ Muslim | 0 | 15 (15.5%) | 35 (100%) | 50 (32%) | |
| ☐ Christian | 7 (26.9%) | 6 (6.2%) | 0 | 13 (8%) | |
| ☐ Catholic | 5 (19.2%) | 1 (1%) | 0 | 6 (4%) | |
| ☐ Jewish | 0 | 1 (1%) | 0 | 1 (1%) | |
| ☐ Others | 13 (50%) | 16 (16%) | 0 | 29 (18%) | |
| Marital status | | | | | |
| ☐ Single | 8 (30.8%) | 32 (33%) | 12 (34.3%) | 52 (33%) | 0.108 |
| ☐ Married | 13 (50%) | 58 (59.8%) | 23 (65.7%) | 94 (59%) | |
| ☐ Divorced | 1 (3.8%) | 3 (3.1%) | 0 | 4 (3%) | |
| ☐ Widow | 1 (3.8%) | 3 (3.1%) | 0 | 4 (3%) | |
| ☐ In relationship | 3 (11.5%) | 1 (1%) | 0 | 4 (3%) | |
| Education | | | | | |
| ☐ Elementary | 0 | 1 (1%) | 5 (14.3%) | 6 (4%) | <0.0001* |
| ☐ High school | 4 (15.4%) | 8 (8.2%) | 0 | 12 (8%) | |
| ☐ Bachelor | 6 (23.1%) | 52 (53.2%) | 24 (64.6%) | 82 (52%) | |
| ☐ Master | 11 (42.3%) | 31 (32%) | 4 (11.4%) | 46 (29%) | |
| ☐ Doctorate | 3 (11.5%) | 4 (4.1%) | 2 (5.7%) | 5 (3%) | |
| ☐ Post doctorate | 2 (7.7%) | 1 (1%) | 0 | 3 (2%) | |
| Occupation | | | | | |
| ☐ Students | 0 | 8 (8.2%) | 4 (11.4%) | 12 (8%) | 0.048* |
| ☐ Employee | 8 (30.8%) | 46 (47.4%) | 19 (54.3%) | 73 (46%) | |
| ☐ Businessman | 6 (23.1%) | 24 (24.7%) | 4 (11.4%) | 34 (22%) | |
| ☐ Housewife | 2 (7.7%) | 6 (6.2%) | 1 (2.9%) | 9 (6%) | |
| ☐ Retired | 5 (19.2%) | 2 (2.1%) | 3 (8.6%) | 10 (6%) | |
| ☐ Others | 5 (19.2%) | 11 (11.3%) | 4 (11.4%) | 20 (13%) | |
| Income(Baht)/month | | | | | |
| ☐ 0-50,000 | 3 (12%) | 19 (20%) | 3 (9%) | 25 (16%) | 0.017* |
| ☐ 50,001-100,000 | 5 (19%) | 30 (31%) | 7 (20%) | 42 (27%) | |
| ☐ 100,001-500,000 | 6 (23%) | 34 (35%) | 15 (43%) | 55 (35%) | |
| ☐ >500,000 | 12 (46%) | 14 (14%) | 10 (29%) | 36 (23%) | |
| Family members working in health care system | | | | | |
| ☐ Yes | 9 (34.6%) | 19 (19.6%) | 12 (34.4%) | 40 (25%) | 0.322 |
| ☐ No | 16 (61.5%) | 72 (74.2%) | 22 (62.9%) | 110 (70%) | |
| ☐ Not sure | 1 (3.8%) | 6 (6.2%) | 1 (2.9%) | 8 (5%) | |

**Table 1** Demographic characteristics of the participants

According to Table 2, only less than one-fourth of the participants were able to know that the person in the video has vitiligo. However, it seemed that Arabian knew this condition more than others as shown in Figure 2. Also, less than one-fourth knew correctly that vitiligo is a hereditary and autoimmune disease and is triggered with psychological stress. Around 40% were aware that this condition can be treated. Less than 35% knew that the etiology of this condition is unknown and not related to internal organ abnormality. Half of the participants disagreed that this condition could be caused by food. Almost two-thirds of the participants believed that this condition is not due to poor hygiene and not contagious by sharing things. More than 70% agreed that this condition is not transmitted by touch, having a meal together or air.

**Table 2** knowledge Responses

| | **Caucasian (n = 26)** | **Asian (n = 97)** | **Arabian (n = 35)** | **Total (n = 158)** | **P value*** |
|---|---|---|---|---|---|
| Q1.Did you know the disease in video? | | | | | |
| ☐ I do not know | 20 (77%) | 71 (73%) | 6 (17%) | 97 (61%) | |
| ☐ I know, (mention the disease name) | 6 (23%) | 26 (27%) | 29 (83%) | 61 (39%) | |
| ☐ "Vitiligo" | 4 (15%) | 5 (5%) | 27 (77%) | 36 (23%) | 0.001* |
| Q2.Is this condition hereditary? "correct" | 3 (12%) | 25 (26%) | 7 (20%) | 35 (22%) | 0.887 |
| Q3.Is this condition triggered by psychological stress? "correct" | 1 (4%) | 13 (13%) | 9 (26%) | 23 (15%) | 0.167 |
| Q4.Is this condition treatable? "correct" | 7 (27%) | 37 (38%) | 17 (49%) | 61 (39%) | 0.487 |
| Q5.Is this condition associated with an immunological defect? "correct" | 6 (23%) | 25 (26%) | 8 (23%) | 39 (25%) | 0.935 |
| Q6.Is this condition caused by unknown etiology? "correct" | 1 (4%) | 34 (35%) | 11 (31%) | 46 (29%) | 0.740 |
| Q7.Is this condition caused by specific food? "correct" | 14 (54%) | 50 (52%) | 15 (43%) | 79 (50%) | 0.743 |
| Q8.Is this condition associated with an internal organ abnormality? "correct" | 8 (31%) | 32 (33%) | 14 (40%) | 54 (34%) | 0.681 |
| Q9.Is this condition contagious by sharing things? "correct" | 17 (65%) | 60 (62%) | 20 (57%) | 97 (61%) | 0.406 |
| Q10.Is this condition caused by hygiene? "correct" | 17 (65%) | 54 (56%) | 25 (71%) | 96 (61%) | 0.818 |
| Q11.Is this condition leprosy? "correct" | 18 (69%) | 51 (53%) | 21 (60%) | 90 (57%) | 0.892 |
| Q12.Is this condition contagious by touching? "correct" | 17 (65%) | 66 (68%) | 28 (80%) | 111(70%) | 0.697 |
| Q13.Is this condition contagious by having a meal together? "correct" | 19 (73%) | 64 (66%) | 29 (83%) | 112(71%) | 0.550 |
| Q14.Is this condition contagious by airborne transmission? "correct" | 18 (69%) | 70 (72%) | 32 (91%) | 120(76%) | 0.848 |
| Q15.Is this condition lethal? "correct" | 17 (65%) | 59 (61%) | 32 (91%) | 108(68%) | 0.787 |
| Overall score (Mean±SD) | 6.4±4 | 6.7±3.3 | 8.4±2.8 | 7±3.4 | 0.017* |

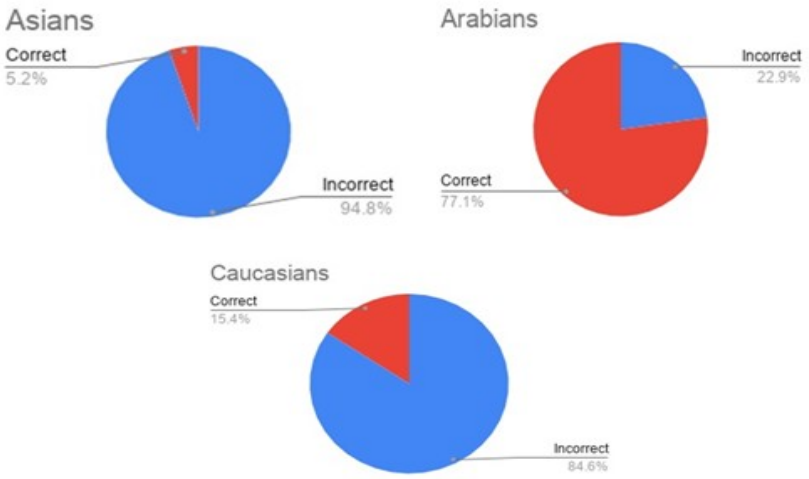


**Figure 2** Mention the disease name

Less than one - fourth of the participants identified the condition in the video as vitiligo. This is the same percentage that Juntongjin et al. mentioned in their previous study (Juntongjin et al, 2018). Also, the percentage of participants who knew correctly that vitiligo is a hereditary disease and caused by stress is matching with the percentage in Juntongjin study "less than 25%". In accordance with previous studies (Alghamdi et al, 2012; Juntongjin et al, 2018), around 40% thought that vitiligo can be treated. However, this percentage is much less than (57.9%) that reported in another study (Fatani et al, 2016).

Previous studies (Alghamdi et al, 2012; Fatani et al, 2016; Juntongjin et al, 2018) showed that more than 40% of participants were aware that vitiligo is an autoimmune disease. In contrast, we found only 25% who knew that vitiligo is an autoimmune disease. Similarly, regarding the etiology and internal organ abnormality association, we found a much prevalent misconception than that was reported by Juntongjin et al. in their study (Juntongjin et al, 2018).

Only less than 35% knew correctly that vitiligo has an unknown etiology and is not associated with internal organ abnormality compared with Juntongjin percentage which was around 45% (Juntongjin et al, 2018). Half of the participants disagreed that any type of food can cause vitiligo. 61% disagreed to be due to lack of hygiene. People who described vitiligo as "non - contagious disease" were less than 75%. Fortunately, this percentage is much higher than that was mentioned in previous studies (Alghamdi et al, 2012; Fatani et al, 2016; Juntongjin et al, 2018). Juntongjin et al. reported that persons who knew that vitiligo is "not lethal" about 77.2% (Juntongjin et al, 2018).

In contrast to their study, we found only 68% who agreed it is not lethal. However, our percentage is still high than that was reported by Fatani et al. (62.9%) as a " non-dangerous disease" (Fatani et al, 2016). Also, more than half of the participants did not confuse vitiligo with leprosy. This is the same as the finding in the previous study (Juntongjin et al, 2018) and higher than (26.9%) that was demonstrated in another paper (Asati et al, 2016). Nearly 80% of the Arabians could identify this condition. Moreover, the Arabians seemed to know this condition more than others significantly. Overall, the average knowledge score was 7±3.4. Arabians has a significantly higher score than other groups. It may be due to the fact that Arabians could recognize this condition correctly.

From the data in this study, it is obvious that there is still a misconception about vitiligo disease in the general population especially the knowledge of its hereditary and autoimmune nature, stress as triggering factor and the unknown etiology of the disease. Only the false beliefs about food or hygiene to

trigger vitiligo and false ideas to be a contagious or infectious disease showed much more improvement in this study compared to other previous studies.

Considering in relationship found between knowledge scores and factors such as gender, age, marital status, education, occupation, income and family members working in the healthcare system, there was no significant association found in our study. However, Fatani et al (2016) reported that females and older participants had a higher significant knowledge score.

Despite using the same methodology (video and questionnaire) as the previous study conducted by Juntongjing et al. (Juntongjin et al, 2018), some findings were obviously different. Unexpected drop by more than 10% in knowledge about the disease cause regarding immunological nature and unknown etiology and internal organ affection was noticed in this study. However, the misconception about vitiligo improved in terms of the non-contagious nature of the disease by touching, having a meal together or inhalation.

**5. Conclusion:**

There is still a prevalent misconception about vitiligo disease in the general population. Less than twenty–five percent know the name of the disease. However, most of the participants realized that this condition was not contagious by touching, having a meal together or inhalation.

**6. Acknowledgements**

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