Stigmatization and social anxiety affecting people living with psoriasis have been associated with poorer quality of life and psychological comorbidities. We conducted a survey among 164 individuals to evaluate misconceptions, discriminatory behavior, and prejudices toward people with psoriasis. At least one misconception was recorded in 64.6% \((n = 106)\) of respondents. About 86.0% \((n = 141)\) reported one or more discriminatory practices and 73.2% \((n = 120)\) reported one or more prejudices. Misconceptions toward psoriasis were associated with an increase in likelihood of prejudicial attitudes. This is influenced by age and education. Future studies should explore whether educating the existing population can reduce prejudice.

**Keywords:** Illness perception, psoriasis, quality of life

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How to cite this article: Yong SS, Tan LL, Ch’ng CC, Yahya F, Pok SL, Ch’ng PY, et al. Personal experience and knowledge about psoriasis reduce misconceptions and discriminatory behavior toward people living with psoriasis in Malaysia. Dermatol Sin 2020;38:35-8.
We, therefore, aimed to assess the level of knowledge, discriminatory attitudes, and behavior toward PLP and to identify potential associated factors.

**Methods**

We conducted a cross-sectional 16-item researcher-administered survey of adult visitors aged 18 years and above to a World Psoriasis Day exhibition held at a teaching hospital in Kuala Lumpur on October 30, 2017. The questionnaire was developed by an expert panel comprising of three dermatologists. Responses to statements assessing misconceptions were categorized as “true,” “false,” or “not sure,” while responses to statements assessing knowledge, behavior, and prejudices were rated on a four-point Likert scale. Respondents were given the option of selecting “do not know.” Internal consistency of the survey questionnaire was assessed with Cronbach’s alpha, which was 0.785 for the misconceptions section, 0.915 for items on discriminatory behavior, and 0.771 for items on prejudices. Item-level face validity was scored by ten independent observers on a Likert scale from 0 to 4 to assess comprehensibility. Face validity index (FVI) was calculated by dividing the summation of item-level scores by the product of the maximum score and the number of raters. For the English language version, FVI was 1.00, while the FVI for the Malay language version was 0.99.

Individuals who would have visited the exhibition included visitors of hospital inpatients and outpatient attendees with their accompanying persons. Inclusion criteria were adults aged 18 years and above who were able to communicate in either the English or Malay language. Individuals unable to provide informed consent were excluded. Written informed consent was obtained from all the participants. Ethical approval was obtained from the University of Malaya Medical Centre Medical Research Ethics Committee (MEC Ref No.2017927-5596).

**Statistical analysis**

Data were analyzed using SPSS (IBM SPSS Statistics for Windows, Version 21.0, Armonk, New York, United States of America) and statistical associations were determined using Pearson’s Chi-square test, Fisher’s exact test where applicable, and bivariate logistic regression. All tests were two-tailed with statistical significance defined as $P < 0.05$. Categories of respondents’ self-assessed level of knowledge were dichotomized into “well informed” (including responses of “very well-informed” and “relatively well informed”) and “not well-informed” (all other responses). Responses to questionnaire items assessing misconceptions were dichotomized into either “misconception” or “no misconception or unsure,” while responses to items assessing behavior were dichotomized into either “yes” (“I would do it without reservations”) or “no” (all other responses). For items assessing negative prejudices, responses were dichotomized into “agree” (including “completely agree” and “mostly agree”) and “disagree” (“mostly disagree,” “completely disagree,” and “do not know”).

**Results**

The median age of the 164 respondents was 44.0 years (interquartile range = 27.0 and 62.0). The male: female ratio was 0.58. About 58.5% ($n = 96$) had tertiary education and 48.8% ($n = 80$) earned less than Malaysian Ringgit (RM) 2000/month [Table 1] which is equivalent to approximately $492.

More than half of the respondents (60.4%, $n = 99$) had heard of psoriasis, while 28.7% ($n = 47$) personally knew someone with psoriasis. Only 5.5% respondents ($n = 9$) considered themselves very well-informed regarding psoriasis, while another 23.2% ($n = 38$) felt relatively well-informed, 31.7% ($n = 52$) very poorly informed, 25.6% ($n = 42$) relatively poorly informed, and 14.0% ($n = 23$) were unsure.

Majority of respondents, 64.6% ($n = 106$) had one or more misconceptions regarding psoriasis, 86.0% ($n = 141$) reported one or more negative behaviors, and 73.2% ($n = 120$) had one or more negative prejudices [Table 2]. Males were more likely to believe that psoriasis was contagious (odds ratio [OR] = 2.639; 95% confidence interval [CI] = 1.040, 6.697), while respondents with tertiary education were less likely to believe that psoriasis was caused by poor hygiene (OR = 0.385; 95% CI = 0.195, 0.760). Respondents who did not feel well-informed about psoriasis were more likely to believe that the disease cannot be treated (OR = 10.231; 95% CI = 2.039, 51.335), while those who had not heard of the disease before were more likely to deny that psoriasis has a genetic component (OR = 2.455; 95% CI = 1.135, 5.308). Respondents who had acquaintances with psoriasis were, however, less likely to be aware of psoriatic arthritis (OR = 0.294; 95% CI = 0.084, 1.036).

Respondents who had heard of psoriasis before, felt well-informed or knew other individuals with psoriasis were less likely to engage in discriminatory behavior (OR = 0.768; 95% CI = 0.689, 0.856; OR = 0.095; 95% CI = 0.035, 0.263; and OR = 0.095; 95% CI = 0.035, 0.263, respectively). While

| Table 1: Study population baseline characteristics and self-assessed level of knowledge regarding psoriasis |
| Demographics | n (%) |
| --- | --- |
| Gender | |
| Male | 60 (36.6) |
| Female | 104 (63.4) |
| Education | |
| Undergraduate | 88 (53.7) |
| Secondary | 56 (34.1) |
| Primary | 10 (6.1) |
| Postgraduate | 8 (4.9) |
| No formal education | 1 (0.6) |
| Not stated | 1 (0.6) |
| Income level (Malaysian Ringgit, RM) | |
| <2000 | 80 (48.8) |
| 2000-5000 | 47 (28.7) |
| 5001-10,000 | 15 (9.1) |
| >10,000 | 7 (4.3) |
| Not stated | 15 (9.1) |
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Table 2: Responses to individual items of the questionnaire to evaluate misconceptions, behavior, and negative prejudices

| Misconceptions                                      | n (% ) |
|-----------------------------------------------------|--------|
| Due to poor hygiene (n=162)                         | 51 (31.5) |
| Not a genetic condition (n=164)                     | 44 (26.8) |
| Not a serious condition (n=164)                     | 27 (16.5) |
| Does not require lifelong treatment (n=163)         | 25 (15.3) |
| Does not affect joints (n=164)                      | 25 (15.2) |
| Contagious (n=164)                                  | 21 (12.8) |
| Cannot be treated (n=162)                           | 9 (5.6) |

| Behavior                                             | n (%) |
|------------------------------------------------------|--------|
| Be friends with someone with psoriasis (n=164)       | 111 (67.7) |
| Sit next to someone with psoriasis (n=164)           | 101 (61.6) |
| Shake hands with person who has psoriasis (n=163)    | 70 (42.9) |
| Let children play with someone with psoriasis (n=163)| 68 (41.7) |
| Eat a meal prepared by someone with psoriasis (n=164)| 60 (36.6) |
| Have intimate relations with someone with psoriasis (n=164)| 29 (17.7) |

| Negative prejudices                                  | n (%) |
|------------------------------------------------------|--------|
| Difficult love life (n=164)                          | 92 (56.1) |
| Problems in securing employment (n=164)              | 92 (56.1) |
| Tend to take more sick leave (n=164)                 | 73 (44.5) |

more respondents were willing to engage in behavior with less physical contact, fewer respondents were willing to shake hands, eat meals prepared by PLP, allow their children to play with PLP, or have intimate relations with PLP [Table 2]. Male respondents were less likely to befriend PLP (OR = 0.362; 95% CI = 0.184, 0.712), sit next to them (OR = 0.519; 95% CI = 0.271, 0.996), or allow children to play with them (OR = 0.511; 95% CI = 0.262, 0.995). However, there was no significant association between the presence of misconceptions or prejudices and behavior.

The presence of any misconception was associated with negative prejudices (OR = 2.333; 95% CI = 1.149, 4.738). Older respondents were more likely to report prejudices toward PLP (OR = 1.023; 95% CI = 1.004, 1.043), particularly in terms of forming intimate relationships (OR = 1.029; 95% CI = 1.012, 1.047). Respondents with tertiary education were less likely to believe that PLP would face difficulties in romantic relationships (OR = 0.501; 95% CI = 0.263, 0.954). Those who had heard of psoriasis before were more likely to report negative prejudices (OR = 3.000; 95% CI = 1.472, 6.115), particularly in terms of romantic relationships (OR = 3.000; 95% CI = 1.568, 5.739).

**Discussion**

Our data indicated a higher proportion of respondents who have misconceptions or reported discriminatory behavior toward PLP compared to data from Halioua et al. in France as only 19.7% of respondents had misconceptions about psoriasis, while only approximately half of respondents in their study indicated discriminatory behavior.[2] We found that self-assessed knowledge about psoriasis and exposure to people living with the condition was associated with less discriminatory behavior, consistent with the data from Halioua et al.[2] The association between misconceptions and prejudices was also consistent with the findings of the study by Halioua et al.[2] There was, however, no association between behavior and misconceptions or prejudices. Thus, we surmise that behavior patterns may be adapted to conform to social acceptability despite underlying unfounded visceral prejudices or fears.

A higher proportion of male respondents reported a belief that psoriasis is contagious and was also more reluctant to befriend PLP, sit next to them or allow children to play with them. Previous research found that females with psoriasis had higher levels of distress and experienced more stigmatization compared to males.[4,5] Females also experienced negative feelings toward their bodies regardless of severity.[6] Future research may be useful to inform the effects of stigma or rejection from the opposite gender among females.

Lower educational levels were associated with particular misconceptions, such as the role of hygiene. In line with these findings, patients from lower socioeconomic strata experienced higher levels of stigmatization.[1,5] These findings can be used to target educational interventions for families of PLP and the general public. Educational material should be easily accessible and comprehensible while avoiding the use of jargon to cater to a wider readership of varying educational levels.

The prejudice against PLP in the workplace is of major concern, as while the cutaneous manifestation of psoriasis should not affect work performance, previous research has found that stigmatization can be associated with issues at work.[7] Older age was associated with prejudice, possibly due to reduced inhibition of stereotypes.[8] Although previous research has suggested that older adults display more socially inappropriate behavior,[9] this was not reflected in our data.

In terms of intimate relationships, psoriasis has been associated with reduced self-rated attractiveness and confidence.[10] Negative effects on self-esteem and body image may impact intimate situations and sexual well-being.[10] Involvement of areas of sexual impact such as the genitals, buttocks, abdomen, or lumbar areas was associated with sexual dysfunction.[11] Conversely, perceived stigma may have unintended positive benefits for patients’ relationships as PLP may have higher appraisals of touch and be more appreciative of partners who are able to accept their skin condition.

It was interesting to note that people who have acquaintance with psoriasis are more likely to believe that psoriasis does not affect joints. We postulate they may base their ideas on personal experiences as only 14.0% of Asian patients with psoriasis have arthritis.[12] Conversely, PLP may not discuss about joint issues, especially as mild arthritis may not be visible.

The limitation of this study was data collection via convenience sampling at a single center in an urban area which may not
reflect beliefs and behavior in rural communities and in the general population.

**Conclusion**

We explored public attitudes and behavior toward PLP in a multiethnic Asian context. PLP often develop coping skills to deal with stigmatization and rejection in daily life. Public education and awareness can be strategies to reduce misconceptions, discrimination, and prejudice.

**Financial support and sponsorship**

This was a self-funded study.

**Conflicts of interest**

There are no conflicts of interest.

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