

The Effect of Stigmatization on Working Nurses' Willingness to Care for Patients with Psoriasis and Its Mediating Factors

Shuzhen KONG^{1*}, Haoru NIU^{2#}, Xinyu XU², Ruixue WANG², Simeng CUI², Jiarui XIE², Weihua ZOU², Jianqiao YE², Deling KONG¹, Cong YAO¹, Huiyun YANG¹, Baibing MI³ and Songmei GENG¹

¹Department of Dermatology, The Second Affiliated Hospital of Xi'an Jiaotong University, Xi'an, Shaanxi, ²Xi'an Jiaotong University Medical Center, Xi'an Jiaotong University, Xi'an, Shaanxi, and ³Department of Epidemiology and Biostatistics, School of Public Health, Xi'an Jiaotong University Health Science Center, Xi'an, Shaanxi, People's Republic of China

*These authors contributed equally to this work.

Psoriasis-related stigmatization affects nurses' willingness to provide care, potentially compromising patient outcomes. However, limited research has examined this issue. A cross-sectional survey of 1,873 nurses was conducted, which assessed 4 stigmatization dimensions and their correlation with the willingness to care for patients with psoriasis, and explored the roles of education, working environment, and self-reported psoriasis knowledge. Structural equation modelling and regression analyses were conducted. The results revealed that stigmatization negatively impacted nurses' willingness to provide care ($p < 0.001$), with social distance exhibiting the strongest effect ($r = -0.476$, $OR = 0.87$, 95% CI: $0.85-0.88$, $p < 0.001$). A significant dose-response relationship was observed, where higher stigmatization levels corresponded to lower care willingness (overall trend test: $p < 0.001$; nonlinear trend test: $p < 0.001$). Nurses with higher education levels ($p < 0.001$) or those working in tertiary hospitals ($p < 0.001$) demonstrated lower willingness to provide care. Interestingly, greater self-reported psoriasis knowledge was associated with increased stigmatization, which in turn reduced care willingness (direct effect: -0.618 ; 95% CI: $-0.814, -0.422$; proportion mediated: 29.0%, 95% CI: $0.094, 0.486$). These findings underscore the need for targeted training programmes, improved work environments, and stigma-reduction initiatives to enhance nurses' willingness to care for patients with psoriasis.

Key words: psoriasis; care; social stigma; social discrimination; nurse education.

Submitted Apr 23, 2025. Accepted after revision Aug 14, 2025

Published Sep 10, 2025. DOI: 10.2340/actadv.v105.43662

Acta Derm Venereol 2025; 105: 43662.

Corr: Baibing Mi, Associate Professor, Department of Epidemiology and Biostatistics, School of Public Health, Xi'an Jiaotong University Health Science Center, No.76, Yanta West Road, Xi'an, Shaanxi, People's Republic of China, and Songmei Geng, Professor, Department of Dermatology, The Second Affiliated Hospital of Xi'an Jiaotong University, NO.157 Xiwu Rd, Xi'an, Shaanxi, People's Republic of China. E-mails: xjtu.mi@xjtu.edu.cn; gengsm2022@xjtu.edu.cn

Psoriasis is a chronic, inflammatory dermatological disorder characterized by immune system dysregulation, leading to erythematous, scaly plaques. In some cases, joint involvement occurs, and acute exacerbations

SIGNIFICANCE

This study demonstrates that stigmatization significantly reduces nurses' willingness to care for patients with psoriasis, with social distance emerging as the most influential factor. Self-reported psoriasis knowledge appeared to indirectly reduce care willingness by 29% through the mediation of stigmatization, though this counterintuitive finding requires cautious interpretation due to methodological limitations. Furthermore, variations in care willingness across educational backgrounds and work environments provide new insights for developing targeted intervention strategies.

may be accompanied by systemic manifestations (1). Approximately 2–3% of the global population is affected by psoriasis, placing a substantial burden on healthcare infrastructure and generating significant economic implications (2). Furthermore, psoriasis severely impacts patients' quality of life, with psychological repercussions including depression, anxiety, and social isolation (3). Due to limited public awareness, individuals with psoriasis frequently encounter social stigma and misconceptions, which exacerbate their psychological distress (4). These factors substantially increase the likelihood of severe mental health issues, including depression, anxiety, and suicide tendencies (5).

Stigmatization refers to the process by which individuals are socially labelled based on perceived negative attributes (6). This stigma often manifests as stereotypes, prejudice, and discriminatory practices (7). A global survey of 8,338 patients with moderate-to-severe psoriasis across 31 countries found that 84% reported experiencing discrimination or humiliation (8). The stigma associated with psoriasis is frequently fuelled by the misconception that the condition is contagious. Negative emotional reactions to images of patients with psoriasis, such as disgust and pity (9), contribute to social avoidance behaviours, including reluctance to engage in physical contact (4). Such exclusionary attitudes exert significant psychological pressure on patients, undermining their treatment adherence and social functioning (10).

As primary healthcare providers, nurses' perceptions and reactions to patients with psoriasis are critical in determining care quality and influencing treatment outcomes. While existing literature has focused on the

stigma perceived by patients from others (4, 9, 10), there is a notable gap regarding healthcare professionals' perspectives, particularly nurses'.

This study addresses this gap by examining how psoriasis-related stigma influences nurses' caregiving intentions by exploring mediating factors that might shape the relationship between stigma and nurses' willingness to care for psoriasis patients. A cross-sectional survey was conducted with 1,873 nurses recruited from 10 hospitals in Shaanxi Province. This research focuses on healthcare providers' attitudes and contributes new insights to improving care delivery for individuals with psoriasis.

MATERIALS AND METHODS

Study design and participants

A multicentre cross-sectional study was conducted in 10 hospitals in Shaanxi Province, China, between August and October 2023. Inclusion criteria included: (i) Registered clinical nurses employed for ≥ 3 months; (ii) agreed to participate in the study. After obtaining consent and completing demographic information, nurses observed 8 standardized images of patients with psoriasis before completing the questionnaire.

Initially, 1,946 nurses participated. However, 73 questionnaires were excluded due to incomplete responses or excessively short completion times (< 1 min). Consequently, 1,873 nurses were included, resulting in a response rate of 96.2%. The datasets have been deposited in Mendeley Data and can be accessed at (11).

Scales and questionnaires

The study employed the "Survey on the Stigmatization Status and Nursing Willingness of Nurses Towards Psoriasis Patients", a tool developed based on prior research (4, 12), consisting of 36 items. For detailed information on the variables and their measurement methods, see Table SI.

Psoriasis Stigma Scale (Questions 20–24) (4, 13, 14): This scale assesses dimensions using a 5-point Likert scale with higher scores indicating stronger stigmatization. Components include:

Emotional Response Scale (Question 20, Cronbach's $\alpha = 0.915$): Evaluates emotional reactions to clinical images.

Stereotypes Scale (Question 21, Cronbach's $\alpha = 0.939$): Measures negative perceptions of individuals with psoriasis.

Social Willingness Scale (Questions 22 and 23, Cronbach's $\alpha = 0.922$): Assesses willingness to engage in social interactions with individuals depicted in psoriasis images.

Misconceptions Scale (Question 24, Cronbach's $\alpha = 0.877$): Evaluates misunderstanding and misconceptions regarding individuals with psoriasis.

Nursing Willingness Scale (Questions 25–36) (15): Simulates specific nursing scenarios related to psoriasis cases, including 12 items such as "Would you be willing to provide a bed bath with gloves on?" Responses are rated on a 10-point scale, with 1 indicating strong unwillingness and 10 indicating strong willingness. Scores are summed and categorized into 4 quartiles, representing different levels of nursing willingness.

The questionnaires showed satisfactory reliability and validity (Cronbach's $\alpha = 0.877$ – 0.939).

Definition of covariates

This questionnaire assesses demographic factors that may influence psoriasis care (see Table SI) (16, 17). Education level, marital status, and work experience are essential for identifying potential biases affecting nurses' approach to patient care.

Education level is categorized as "College or below" and "Bachelor's or above", potentially influencing nurses' knowledge and attitudes towards psoriasis. Professional identity includes categories such as "Nurse", "Intern Nurse", and "Other", reflecting differences in nursing experience and training. Work experience categories (1–5, 6–10, 11–15, 16–20, ≥ 21 years) examined associations between experience and nursing willingness. Hospitals were classified according to China's hospital grading system as Tertiary A/B or Secondary A/B. Tertiary hospitals represent the highest level of healthcare institutions with advanced equipment, specialized departments, and higher-level healthcare professionals.

These covariates are assessed through self-report to control for potential confounding variables.

Statistical analysis

Statistical analyses used R 4.4.1 (R Foundation for Statistical Computing, Vienna, Austria). Continuous variables are reported as mean (SD) or median [IQR], and categorical variables as numbers (%). If parametric test assumptions are unmet, the Kruskal–Wallis (KW) test ensures robust analysis.

A correlation heat map illustrated relationships between nursing willingness and stigmatization dimensions.

An ordinal multivariate logistic regression model categorized stigma dimensions based on quartiles to explore relationship between psoriasis-related stigmatization and nursing willingness. Three models were constructed:

- Model 1: Incorporated only the 4 stigmatization dimensions.
- Model 2: Extended Model 1 with demographic variables.
- Model 3: Further adjusted for all factors, including stigma-related factors, demographic characteristics, and other covariates.

Using Model 3's adjustment strategy, restricted cubic spline (RCS) regression examined dose–response relation-

ship between stigmatization level and nursing willingness. Subgroup analysis examined heterogeneity across groups. Finally, mediation analysis investigated stigmatization's mediating role in the relationship between nursing knowledge and willingness to care using maximum likelihood estimation. Model fit was evaluated using multiple indices: $\chi^2/df < 3.00$, standardized root mean square residual (SRMR) < 0.05 , root mean square error of approximation (RMSEA) < 0.05 , goodness-of-fit index (GFI) > 0.90 , adjusted goodness-of-fit index (AGFI) > 0.90 , normed fit index (NFI) > 0.90 , comparative fit index (CFI) > 0.90 , and Tucker–Lewis index (TLI) > 0.90 . Significance level was set at $\alpha = 0.05$.

RESULTS

Demographic and clinical characteristics of the study population

A total of 1,873 nurses participated in the survey, with 1,824 females (97.4%) and 49 males (2.6%). The median

age was 32.0 years (IQR: 27.0–36.0 years). Overall, 1,195 nurses (63.8%) held a bachelor's degree or higher. The majority of participants were nurse assistants (50.0%). Regarding professional experience, 641 nurses (34.2%) had 6 to 10 years of work experience. A significant portion, 1,044 (55.7%), worked in tertiary hospitals, while 829 nurses (44.3%) were employed in secondary hospitals. In terms of psoriasis-related exposure, 535 nurses (28.8%) had cared for psoriasis patients, 658 (35.1%) were acquainted with individuals who have psoriasis, and 776 (41.4%) had some form of psoriasis-related knowledge or education. However, 989 nurses (52.8%) reported having no prior exposure.

Several factors were found to significantly affect nurses' willingness to provide care for psoriasis patients, including place of residence, marital status, type of work unit, prior experience with psoriasis patients, personal acquaintance with psoriasis patients, and level of self-reported psoriasis knowledge ($p < 0.05$).

Regarding stigmatization, the Emotional Response score had a median of 27.0 (IQR: 21.0–33.0), the Ste-

Table I. Comparison of characteristics between nurses with different willingness ($n = 1,873$)

Item	Willingness to use narrative-nursing					p-value
	Total ($n = 1873$)	Q1 ($n = 469$)	Q2 ($n = 468$)	Q3 ($n = 468$)	Q4 ($n = 468$)	
Gender, n (%)						0.433
Male	49 (2.6)	12 (2.6)	13 (2.8)	8 (1.7)	16 (3.4)	
Age, median (IQR), years	32.0 (27.0–36.0)	32.0 (28.0–36.0)	31.0 (27.0–35.0)	32.0 (27.0–36.0)	32.0 (28.0–36.0)	0.663
Education level, n (%)						0.398
College or below	678 (36.2)	174 (37.1)	182 (38.9)	160 (34.2)	162 (34.6)	
Bachelor's or higher	1195 (63.8)	295 (62.9)	286 (61.1)	308 (65.8)	306 (65.4)	
Place of residence, n (%)						0.004
Rural	1266 (67.6)	318 (67.8)	345 (73.7)	294 (62.8)	309 (66.0)	
Marital status, n (%)						0.044
Unmarried	447 (23.9)	96 (20.5)	107 (22.9)	135 (28.8)	109 (23.3)	
Married	1407 (75.1)	368 (78.5)	356 (76.1)	331 (70.7)	352 (75.2)	
Divorced/Widowed	14 (0.7)	5 (1.1)	2 (0.4)	2 (0.4)	5 (1.1)	
Other	5 (0.3)	0 (0)	3 (0.6)	0 (0)	2 (0.4)	
Working position, n (%)						0.409
Nurse	439 (23.4)	107 (22.8)	118 (25.2)	115 (24.6)	99 (21.2)	
Nursing Assistant	936 (50.0)	234 (49.9)	237 (50.6)	227 (48.5)	238 (50.9)	
Head Nurse	424 (22.6)	101 (21.5)	99 (21.2)	109 (23.3)	115 (24.6)	
Associate Chief Nurse and above	74 (4.0)	27 (5.8)	14 (3.0)	17 (3.6)	16 (3.4)	
Years of nursing experience, n (%)						0.727
1~5	534 (28.5)	127 (27.1)	144 (30.8)	133 (28.4)	130 (27.8)	
6~10	641 (34.2)	170 (36.2)	167 (35.7)	155 (33.1)	149 (31.8)	
11~15	395 (21.1)	93 (19.8)	93 (19.9)	104 (22.2)	105 (22.4)	
16~20	139 (7.4)	33 (7.0)	32 (6.8)	33 (7.1)	41 (8.8)	
≥ 21	164 (8.8)	46 (9.8)	32 (6.8)	43 (9.2)	43 (9.2)	
Type of work unit, n (%)						< 0.001
Secondary hospital	1044 (55.7)	289 (61.6)	297 (63.5)	227 (48.5)	231 (49.4)	
Tertiary hospital	829 (44.3)	180 (38.4)	171 (36.5)	241 (51.5)	237 (50.6)	
Experience in nursing patients with psoriasis, n (%)						< 0.001
Yes	535 (28.6)	116 (24.7)	114 (24.4)	125 (26.7)	180 (38.5)	
Acquaintances with psoriasis, n (%)						< 0.001
Yes	658 (35.1)	155 (33.0)	134 (28.6)	168 (35.9)	201 (42.9)	
Have knowledge of or studied psoriasis, n (%)						< 0.001
Yes	776 (41.4)	130 (27.7)	167 (35.7)	205 (43.8)	274 (58.5)	
Level of understanding and exposure to psoriasis, n (%)						< 0.001
Never understood or encountered psoriasis patients	989 (52.8)	273 (58.2)	279 (59.6)	244 (52.1)	193 (41.2)	
Encountered psoriasis patients	366 (19.5)	99 (21.1)	85 (18.2)	88 (18.8)	94 (20.1)	
Nursed psoriasis patients	518 (27.7)	97 (20.7)	104 (22.2)	136 (29.1)	181 (38.7)	
Emotional Response (IQR)	27.0 (21.0–33.0)	29.0 (24.0–36.0)	27.0 (23.0–33.0)	26.0 (20.0–31.0)	23.0 (18.0–29.0)	< 0.001
Stereotypes (IQR)	39.0 (31.0–46.0)	43.0 (38.0–52.0)	39.0 (35.8–46.0)	39.0 (32.0–44.0)	35.0 (26.0–40.0)	< 0.001
Social Distance(IQR)	27.0 (23.0–31.0)	32.0 (27.0–36.0)	27.0 (26.0–31.0)	27.0 (23.0–29.0)	23.0 (19.0–27.0)	< 0.001
Misconceptions (IQR)	40.0 (34.0–44.0)	42.0 (37.0–47.0)	40.0 (34.0–43.2)	40.0 (34.0–44.0)	37.0 (31.0–42.0)	< 0.001

reotypes score had a median of 39.0 (IQR: 31.0–46.0), the Social Distance score had a median of 27.0 (IQR: 23.0–31.0), and the Misconceptions score had a median of 40.0 (IQR: 34.0–44.0). Statistically significant differences were observed across all these dimensions ($p < 0.001$), as detailed in **Table I**.

Correlations between stigmatization dimensions and nurses' willingness to care

Significant negative correlations were observed between the 4 dimensions of stigmatization (emotional response, stereotypes, social distance, and misconceptions) and nurses' willingness to provide care for psoriasis patients ($p < 0.001$) (**Fig. 1**). These findings suggest that higher levels of stigmatization are associated with lower nursing willingness to care for these patients. Among the 4 dimensions, the most prominent negative correlation was found between nursing willingness and social distance ($r = -0.476$), indicating that nurses' reluctance to engage with psoriasis patients socially has the most substantial negative impact on their willingness to provide care.

To further explore the hierarchical impact of stigmatization on nursing willingness, an ordered logistic regression analysis was conducted (**Table II**). The odds ratios (ORs) for all stigmatization dimensions were consistently less than 1 ($p < 0.001$), reinforcing the finding that higher stig-

matization levels are strongly associated with decreased nursing willingness. For instance, the OR for social distance was 0.86 in the unadjusted model (Model 1), and remained at 0.87 after adjusting for demographic and confounding factors (Models 2 and 3), demonstrating a stable and significant negative effect. Other dimensions showed weaker, though still significant, negative associations, with ORs ranging from 0.95 to 0.96 in Model 3. The minimal change in ORs across models highlights the consistent and critical role of stigmatization in reducing nursing willingness.

Dose-response analysis of stigmatization levels and nursing willingness

A dose-response relationship was evident between the level of stigmatization and the willingness to care (**Fig. 2**). As stigmatization scores increased, the β values for nursing willingness decreased, signifying an amplified negative impact of higher stigmatization. Social distance emerged as the most influential dimension, with a clear and consistent decline in β values as stigmatization increased. Other dimensions, though still exhibiting significant negative effects, demonstrated weaker and more gradual changes. This dose-response relationship suggests that the adverse impact of stigmatization is more pronounced at moderate levels of stigma, with a potential saturation point at higher levels, where the rate

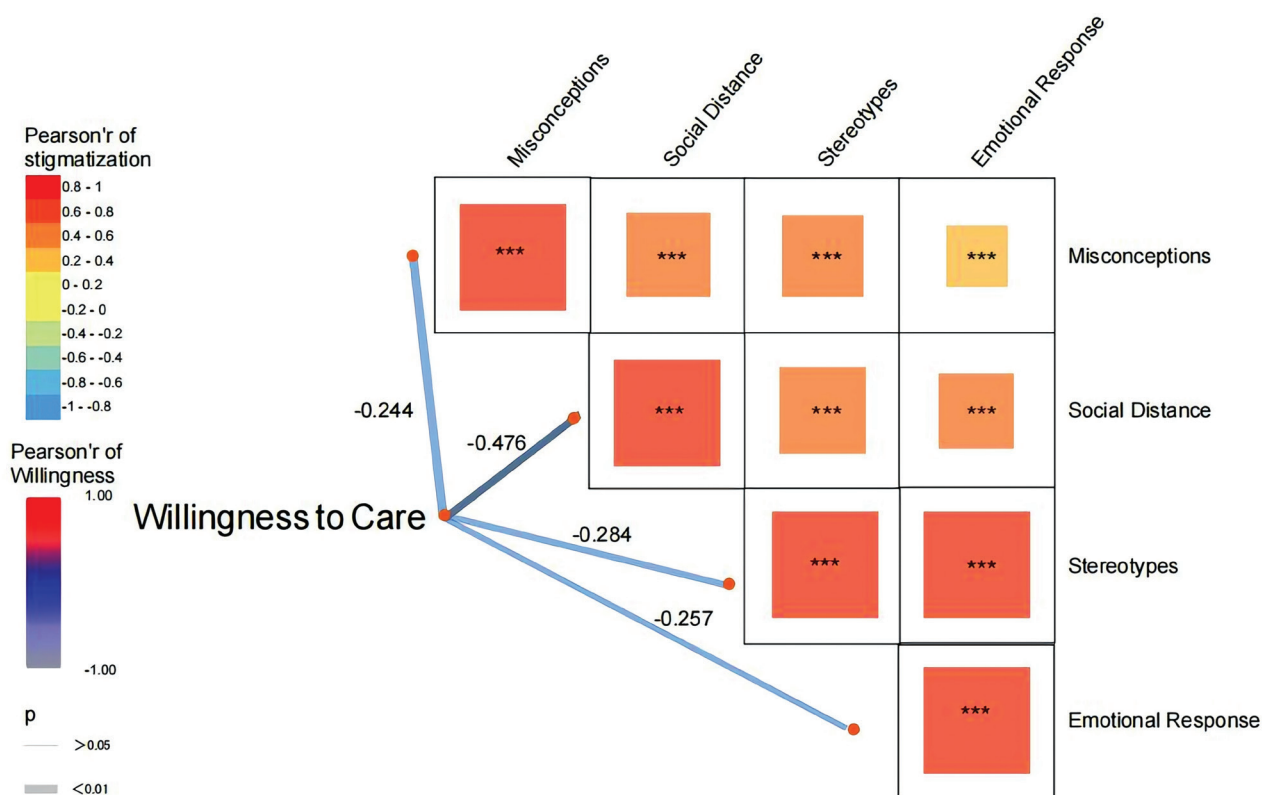


Fig. 1. Correlation heatmap of stigmatization dimensions and willingness to care. The colour gradient above represents the correlation of Pearson correlation coefficient in the 4 dimensions of stigmatization; the colour gradient below represents the correlation between Pearson correlation coefficient and nursing intention in the dimension of stigmatization. The size and colour of the blocks represent the correlation size. The width of the line represents the p -value, and the thick line represents $p < 0.01$. The value above the line is the correlation coefficient.

Table II. Logistic regression of stigmatization and willingness to care in psoriasis patients

Variable	Model 1		Model 2		Model 3	
	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value
Emotional Response	0.94 (0.94 ~ 0.95)	<0.001	0.94 (0.94 ~ 0.95)	<0.001	0.95 (0.94 ~ 0.96)	<0.001
Stereotypes	0.95 (0.95 ~ 0.96)	<0.001	0.95 (0.95 ~ 0.96)	<0.001	0.96 (0.95 ~ 0.97)	<0.001
Social Distance	0.86 (0.85 ~ 0.88)	<0.001	0.86 (0.85 ~ 0.87)	<0.001	0.87 (0.85 ~ 0.88)	<0.001
Misconceptions	0.95 (0.94 ~ 0.96)	<0.001	0.96 (0.95 ~ 0.96)	<0.001	0.96 (0.95 ~ 0.97)	<0.001

Model 1: Crude model.
Model 2: Adjusted for demographic characteristics including age, gender, education level, place of origin, professional identity, marital status, professional title, years of work experience, and level of the working hospital.
Model 3: Adjusted for demographic characteristics and factors related to previous contact and nursing experience.
OR: odds ratios; CI: confidence intervals.

of decline in nursing willingness becomes less steep. This pattern warrants further investigation to explore whether a threshold effect exists, beyond which further increases in stigmatization may have diminishing returns on the willingness to care.

Mediation effect of stigmatization in the relationship between psoriasis knowledge and willingness to care
Structural equation modelling revealed that stigmatization serves as a mediator in the relationship between psoriasis

knowledge and willingness to care. The model fit indices were satisfactory, with $\chi^2/df=1.022$, SRMR=0.011, RMSEA=0.031, GFI=0.981, AGFI=0.990, NFI=0.981, CFI=0.981, and TLI=1.194, indicating a good fit.
Notably, when the stereotypes dimension of stigmatization was included as a latent variable, the model became invalid. However, self-reported psoriasis knowledge appeared to indirectly influence willingness to care through 3 specific dimensions of stigmatization: misconceptions, social distance, and emotional response. Specifically, self-reported psoriasis knowledge showed

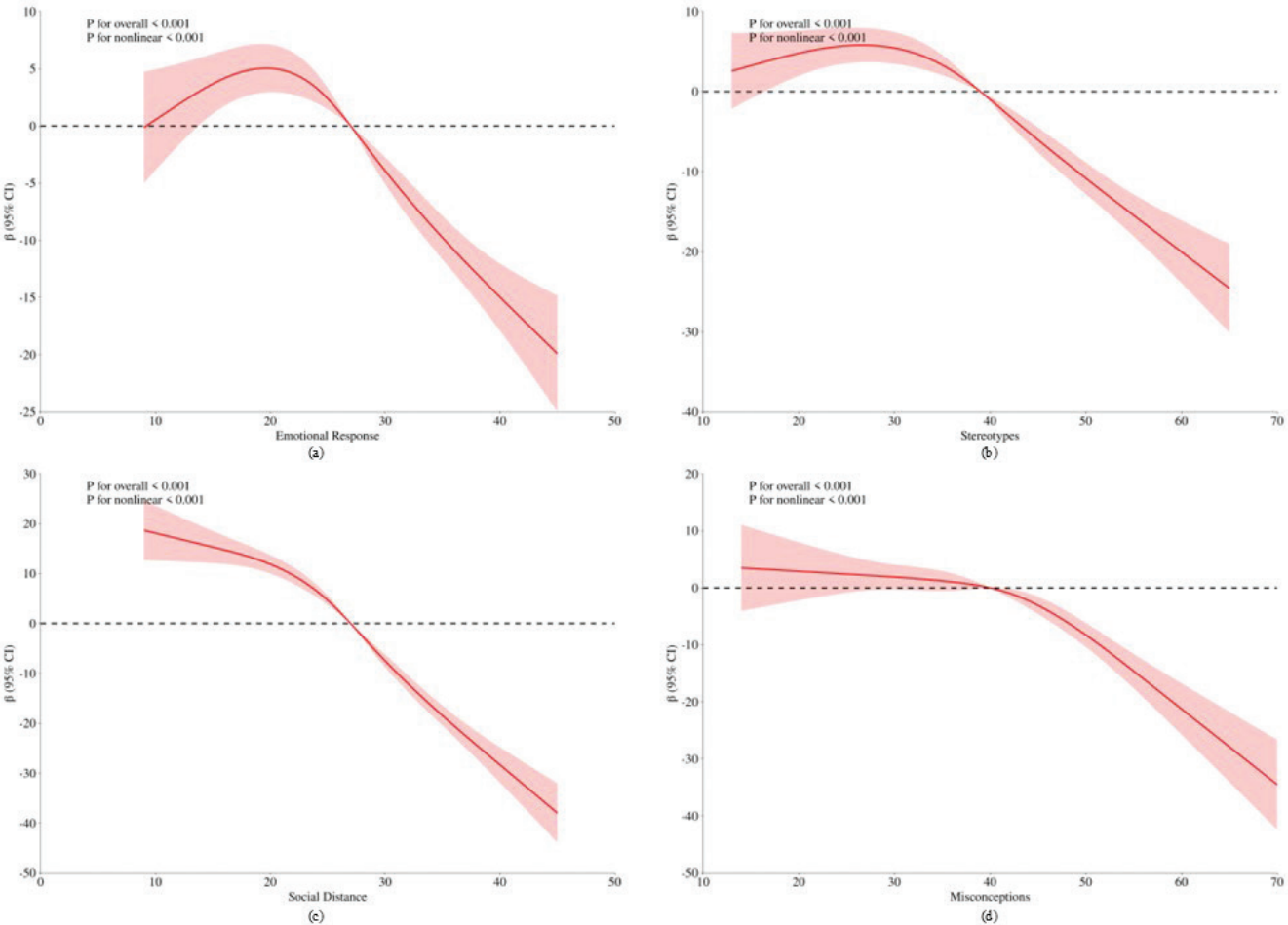


Fig. 2. Dose-response relationship between 4 dimensions of stigmatization and willingness to care. The x-axis represents Stigmatization: (a) Emotional Response, (b) Stereotypes, (c) Social Distance, (d) Misconceptions. The y-axis indicates the β -value calculated by the model (adjusted for demographic characteristics and factors related to previous contact and nursing experience). The shadowed area represents the 95% confidence interval (95% CI) (test for overall trend: $p < 0.001$; test for nonlinear trend: $p < 0.001$).

a negative correlation with nursing willingness (Direct effect: -0.618 ; 95% CI: -0.814 , -0.422), with higher levels of self-reported knowledge appearing to correlate with increased stigmatization (Mediation ratio: 29.0%, 95% CI: 9.4%, 48.6%), which, in turn, was associated with reduced nursing willingness to provide care (Table SI, Fig. 3). Nonetheless, these findings should be interpreted cautiously given the limitations in how knowledge was measured and the cross-sectional nature of the study.

Impact of subgroup variables on the relationship between stigmatization and willingness to care

To examine potential variations in the relationship between stigmatization dimensions and nursing willingness across different subgroups, stratified analyses were conducted (Table III). Significant interactions were found in the following stratified variables: education level (social distance, p for interaction = 0.036), type of work unit (stereotypes, social distance, and misconceptions, p for interaction = 0.044, <0.001 , and 0.013, respectively), and familiarity with or prior knowledge of psoriasis (emotional response, stereotypes, and social distance, p for interaction = 0.007, 0.002, and <0.001 , respectively). However, no statistically significant interactions were observed for other subgroup variables (p for interaction >0.05).

DISCUSSION

The stigmatization of psoriasis remains a persistent issue in both medical and socio-psychological contexts (4, 10, 18). While existing literature has established that patient-experienced stigmatization correlates with various clinical and psychological factors, including symptom severity (19), quality of life (20), and psychological outcomes such as depression and emotional distress (20), limited research has explored the influence of stigmatization on healthcare professionals' willingness to care for psoriasis patients. This gap is of particular

concern, as it may adversely affect the quality of care and, ultimately, patient outcomes.

In the present study, involving 1,873 nurses, all dimensions of stigmatization – emotional response, stereotypes, social distance, and misconceptions – were found to significantly and negatively affect nurses' willingness to care for psoriasis patients, with social distance exerting the strongest and most consistent effect. Specifically, as stigmatization levels increased, there was a marked decline in nursing willingness, demonstrating a clear dose-response relationship. Mediation analysis further revealed an unexpected association where self-reported psoriasis knowledge appeared to correlate with higher levels of stigmatization, which in turn was associated with lower willingness to provide care, though this finding requires cautious interpretation given the study's limitations. Subgroup analyses highlighted consistent effects across most variables, with significant interactions observed for education level, hospital grade, and familiarity with psoriasis.

Among the dimensions of stigmatization, social distance emerged as the most influential, potentially due to the avoidance behaviours and feelings of alienation that nurses may experience concerning psoriasis patients (4). A study conducted in Germany (21) found that 13% of participants were unwilling to shake hands with psoriasis patients, and 27% avoided forming personal relationships, indicating that social distance may promote avoidance behaviours (22), which directly impact the willingness to provide care (23).

Interestingly, we observed that the negative impact of stigmatization was more pronounced at moderate levels of stigma but diminished at higher levels, suggesting a potential threshold or saturation effect. This nonlinear pattern is similar to the inverted U-shaped response often observed in psychological stress and emotional response (24, 25), where initial effects are strong but tend to attenuate over time. Chronic exposure to high levels of stigmatization may result in psychological adaptation or "tolerance". Additionally, allocating greater resources at advanced stages may lead to enhanced professional

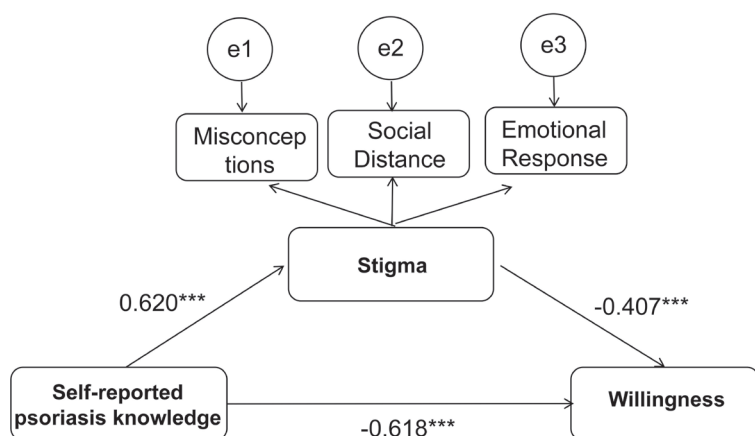


Fig. 3. Final model and standardized model paths.

Table III. Adjusted odds ratios of stigmatization by subgroups

Variable	Emotional Response		Stereotypes		Social Distance		Misconceptions	
	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value
Gender		0.251		0.935		0.373		0.896
Male	0.72 (0.50~1.02)	0.064	0.95 (0.88~1.03)	0.227	0.73 (0.54~0.99)	0.044	1.01 (0.86~1.18)	0.943
Female	0.95 (0.94~0.97)	<0.001	0.96 (0.95~0.97)	<0.001	0.87 (0.86~0.89)	<0.001	0.95 (0.94~0.97)	<0.001
Age		0.882		0.258		0.276		0.664
< 27	0.94 (0.91~0.97)	<0.001	0.95 (0.92~0.97)	<0.001	0.86 (0.82~0.91)	<0.001	0.93 (0.90~0.96)	<0.001
27~32	0.96 (0.93~0.98)	<0.001	0.97 (0.95~0.99)	0.002	0.88 (0.85~0.91)	<0.001	0.96 (0.94~0.98)	<0.001
32~37	0.95 (0.92~0.97)	<0.001	0.96 (0.95~0.98)	<0.001	0.87 (0.84~0.91)	<0.001	0.95 (0.93~0.97)	<0.001
≥ 37	0.95 (0.92~0.98)	<0.001	0.94 (0.92~0.96)	<0.001	0.84 (0.80~0.88)	<0.001	0.95 (0.93~0.98)	<0.001
Education level		0.138		0.134		0.036		0.655
College or below	0.96 (0.94~0.98)	<0.001	0.97 (0.95~0.98)	<0.001	0.89 (0.87~0.92)	<0.001	0.96 (0.94~0.98)	<0.001
Bachelor's or above	0.94 (0.93~0.96)	<0.001	0.95 (0.94~0.97)	<0.001	0.86 (0.83~0.88)	<0.001	0.95 (0.94~0.97)	<0.001
Type of work unit		0.067		0.044		<0.001		0.013
Secondary hospital	0.96 (0.94~0.98)	<0.001	0.97 (0.96~0.98)	<0.001	0.89 (0.87~0.92)	<0.001	0.96 (0.95~0.98)	<0.001
Tertiary hospital	0.94 (0.92~0.96)	<0.001	0.95 (0.93~0.96)	<0.001	0.81 (0.78~0.85)	<0.001	0.93 (0.90~0.95)	<0.001
Experience in nursing psoriasis patients		0.218		0.900		0.695		0.875
Yes	0.96 (0.94~0.99)	0.007	0.96 (0.94~0.98)	<0.001	0.86 (0.82~0.90)	<0.001	0.96 (0.93~0.98)	<0.001
No	0.95 (0.93~0.96)	<0.001	0.96 (0.95~0.97)	<0.001	0.87 (0.85~0.89)	<0.001	0.95 (0.94~0.97)	<0.001
Acquaintances with psoriasis		0.340		0.373		0.991		0.113
Yes	0.94 (0.92~0.96)	<0.001	0.95 (0.93~0.97)	<0.001	0.86 (0.83~0.90)	<0.001	0.97 (0.95~0.99)	0.001
No	0.96 (0.94~0.97)	<0.001	0.96 (0.95~0.98)	<0.001	0.87 (0.85~0.89)	<0.001	0.95 (0.93~0.96)	<0.001
Have knowledge of or studied psoriasis		0.007		0.002		<.001		0.083
Yes	0.92 (0.90~0.95)	<0.001	0.94 (0.92~0.96)	<0.001	0.82 (0.79~0.86)	<0.001	0.94 (0.91~0.96)	<0.001
No	0.96 (0.95~0.98)	<0.001	0.97 (0.96~0.98)	<0.001	0.89 (0.87~0.91)	<0.001	0.96 (0.95~0.98)	<0.001
Level of understanding and exposure to psoriasis, n (%)		0.119		0.132		0.307		0.222
Never understood or encountered psoriasis patients	0.96 (0.94~0.98)	<0.001	0.97 (0.95~0.98)	<0.001	0.88 (0.86~0.90)	<0.001	0.95 (0.93~0.96)	<0.001
Encountered psoriasis patients	0.96 (0.93~0.99)	0.004	0.96 (0.94~0.98)	<0.001	0.87 (0.83~0.91)	<0.001	0.97 (0.95~1.00)	0.035
Nursed psoriasis patients	0.93 (0.90~0.96)	<0.001	0.94 (0.92~0.96)	<0.001	0.84 (0.80~0.88)	<0.001	0.94 (0.92~0.97)	<0.001

OR: odds ratios; CI: confidence intervals.

achievement, which could alleviate some of the negative emotional effects (24, 26).

Our findings indicate that the relationship between stigmatization and nursing willingness is multifaceted, influenced by factors such as nurses' educational background, work environment, and familiarity with the disease. Nurses with higher education levels or those working in tertiary hospitals demonstrated a lower willingness to provide care, a finding that contrasts with previous studies (27, 28). This discrepancy may be attributed to a preference among highly educated nurses for roles that focus on management, research, or specialization, which may not align with the routine clinical responsibilities of providing direct patient care. Furthermore, nurses in tertiary hospitals often occupy roles designed for healthcare delivery, reducing costs, and improving patient outcomes (29, 30). These settings may involve higher psychological pressure and workloads, which could limit engagement in non-urgent care tasks such as psoriasis management.

An unexpected and counterintuitive finding was the apparent association between self-reported psoriasis knowledge and increased stigmatization, apparently reducing care willingness. However, this finding requires careful interpretation due to several methodological limitations. First, our measure of "knowledge" was based on self-reported exposure to psoriasis-related information rather than validated assessment of actual

clinical understanding or accuracy of knowledge. This measure may better reflect perceived knowledge or information exposure rather than true clinical competence. This may be related to the Dunning-Kruger effect, whereby individuals with limited actual knowledge or skills tend to overestimate their competence (31), potentially reinforcing rather than correcting stigmatizing beliefs. Second, the cross-sectional design prevents determination of: it is equally plausible that nurses with pre-existing stigmatizing attitudes are more likely to seek out or recall negative information concerning psoriasis, further strengthening perceptions of psoriasis as "treatment resistant" or "burdensome", and thus lowering care willingness. Third, prior studies suggest that stigma is typically reduced when accurate clinical knowledge is delivered through structured training programmes that also incorporate empathy-based education (14, 21). In the case of psoriasis – a dermatological condition typically managed within specialty care – persistent educational gaps (14), particularly regarding its non-contagious nature and underlying pathophysiology, combined with the high prevalence of nurse burnout (32), may limit the effectiveness of conventional training. Burnout has been shown to impair care capacity and patient safety, particularly in high-pressure environments such as tertiary hospitals (33–35). Post-COVID studies reveal persistent burnout and turnover intent among nurses, moderated by work

environment quality; improved environments lowered these risks (36). While another study demonstrated that interventions aimed at improving healthcare workers' well-being and resilience effectively reduced burnout and enhanced engagement (37), improving environments alone may not fully enhance care willingness for conditions like psoriasis.

In light of these findings, we recommend a stepped intervention strategy. At the foundational level, interventions such as optimizing the nurse-to-patient ratios and providing adequate resources and support can reduce the perceived risks and stigma associated with psoriasis care, thereby improving nurses' willingness to engage (38). At the advanced level, specialized psoriasis training that emphasizes evidence-based understanding of pathophysiology and non-contagiousness should be implemented, combined with contact-based interventions (39). This dual approach is expected to both mitigate the erosion of nurses' cognitive capacity caused by systemic stressors and simultaneously establish a sustainable mechanism for enhancing care willingness. There are several limitations to this study that warrant careful consideration. First, the cross-sectional design precludes the establishment of causal relationships, particularly regarding the unexpected association between self-reported knowledge and stigmatization. Second, our assessment of "psoriasis knowledge" was based on a binary self-report measure of exposure to psoriasis-related information rather than validated assessment of actual clinical knowledge or understanding. This limitation significantly affects the interpretation of our knowledge-related findings. Third, self-assessed scales may cause response bias as participants may skew answers to meet social norms or self-views. Fourth, the mainly Chinese sample restricts the findings' generalizability to other cultures. Future research should employ longitudinal designs to better understand the temporal relationships between knowledge acquisition, stigmatization, and care willingness. Additionally, studies using validated knowledge assessment tools and multicentre designs with diverse populations are needed to provide more robust evidence regarding the complex relationships observed in this study.

This study demonstrates that stigma significantly negatively impacts nurses' willingness to care for patients with psoriasis. The relationship between stigma and care willingness is modulated by factors such as nurses' educational background, work environment, and familiarity with the disease. These findings underscore the importance of providing targeted psoriasis-related training to nurses to dispel misconceptions and reduce stigmatizing attitudes. Concurrently, fostering a positive work environment that addresses issues is critical. Such efforts can enhance empathy, improve care quality, mitigate stigma, and ultimately increase nurses' willingness to care for psoriasis patients.

ACKNOWLEDGEMENTS

The authors extend their sincere gratitude to all the nurses who participated in this study and to the faculty and administrative staff at the Second Affiliated Hospital of Xi'an Jiaotong University and Xi'an Jiaotong University for their support. They also appreciate the assistance provided by their research team members in data collection and management. Finally, they thank the reviewers for their insightful suggestions, which helped improve this manuscript.

This work was supported by the National Natural Science Foundation of China (Grant Number: 82103944) and the Science and Technology Resources Open Sharing Platform of the Shaanxi Province (Grant Number: 2023-CX-PT-47).

Data availability statement: The data that support the findings of this study are available in "Mendeley Data" (11).

Ethics declarations & trial registry information. This study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Ethics Committee of the Second Affiliated Hospital of Xi'an Jiaotong University (approval number: 2023448). All nurses provided informed consent prior to enrolment, and all data were collected, stored, and analysed in a strictly anonymized manner.

Declaration of generative AI and AI-assisted technologies in the writing process: During the preparation of this work, the authors used ChatGPT-4o in order to refine and polish the writing. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Disclosure statements: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. Kaufman BP, Alexis AF. psoriasis in skin of color: insights into the epidemiology, clinical presentation, genetics, quality-of-life impact, and treatment of psoriasis in non-white racial/ethnic groups. *Am J Clin Dermatol* 2018; 19: 405–423. <https://doi.org/10.1007/s40257-017-0332-7>
2. Sewerin P, Brinks R, Schneider M, Haase I, Vordenbäumen S. Prevalence and incidence of psoriasis and psoriatic arthritis. *Ann Rheum Dis* 2019; 78: 286–287. <https://doi.org/10.1136/annrheumdis-2018-214065>
3. Hawro M, Maurer M, Weller K, Maleszka R, Zalewska-Janowska A, Kaszuba A, et al. Lesions on the back of hands and female gender predispose to stigmatization in patients with psoriasis. *J Am Acad Dermatol* 2017; 76: 648–654.e2. <https://doi.org/10.1016/j.jaad.2016.10.040>
4. Pearl RL, Wan MT, Takeshita J, Gelfand JM. Stigmatizing attitudes toward persons with psoriasis among laypersons and medical students. *J Am Acad Dermatol* 2019; 80: 1556–1563. <https://doi.org/10.1016/j.jaad.2018.08.014>
5. Singh S, Taylor C, Kornmehl H, Armstrong AW. Psoriasis and suicidality: a systematic review and meta-analysis. *J Am Acad Dermatol* 2017; 77: 425–440.e2. <https://doi.org/10.1016/j.jaad.2017.05.019>
6. Major B, O'Brien LT. The social psychology of stigma. *Annu Rev Psychol* 2005; 56: 393–421. <https://doi.org/10.1146/annurev.psych.56.091103.070137>
7. Aranda AM, Helms WS, Patterson KDW, Roulet TJ, Hudson BA. Standing on the shoulders of Goffman: advancing a relational research agenda on stigma. *Business & Society* 2023; 62: 1339–1377. <https://doi.org/10.1177/00076503221148441>
8. Armstrong A, Jarvis S, Boehncke WH, Rajagopalan M, Fernández-Peñas P, Romiti R, et al. Patient perceptions of clear/almost clear skin in moderate-to-severe plaque psoriasis: results of the Clear About Psoriasis worldwide survey. *J Eur Acad Dermatol Venereol* 2018; 32: 2200–2207. <https://doi.org/10.1111/jdv.15065>
9. Fino E, Mazzetti M, Russo PM. Psoriasis-related stigma and

- its intersection with intergroup bias in medical students. *J Am Acad Dermatol* 2021; 84: 1432–1434. <https://doi.org/10.1016/j.jaad.2020.06.060>
10. Zhang H, Yang Z, Tang K, Sun Q, Jin H. Stigmatization in patients with psoriasis: a mini review. *Front Immunol* 2021; 12: 715839. <https://doi.org/10.3389/fimmu.2021.715839>
 11. Kong SZ, Niu HR, Xu XY, Wang RX, Cui SM, Xie JR, et al. The effect of stigmatization on working nurses' willingness to care for patients with psoriasis. *Mendeley Data V1*; 2025, February 7, Version 1. <https://doi.org/10.17632/dsgb4tn2k4.1>
 12. Sneijna Vassileva M. Commentary on "Stigmatizing Attitudes toward Persons with Psoriasis among Laypersons and Medical Students". *Skinmed* 2019; 17: 415.
 13. Simona M, Christopher E, Selina M, Alexander Z, Pablo S, Maximilian S, et al. The potential of Instagram to reduce stigmatization of people with psoriasis: a randomized controlled pilot study. *Acta Derm Venereol* 2023; 103: adv3513. <https://doi.org/10.2340/actadv.v103.3513>
 14. Weinberger N-A, Mrowietz S, Luck-Sikorski C, von Spreckelsen R, John SM, Sommer R, et al. Effectiveness of a structured short intervention against stigmatization in chronic visible skin diseases: results of a controlled trial in future educators. *Health Expect* 2021; 24: 1790–1800. <https://doi.org/10.1111/hex.13319>
 15. Huang Y. Towards understanding current clinical nurses' knowledge, attitude, and willingness to care for HIV/AIDS patients among hospitals in Zhejiang province. Master's thesis, Zhejiang University; 2016.
 16. M PR, Joerg L, A HC. The stigmatizing effect of visual media portrayals of obese persons on public attitudes: does race or gender matter? *J Health Commun* 2013; 18: 805–826. <https://doi.org/10.1080/10810730.2012.757393>
 17. Pan Y, Qi Q, Qiu H, Yang C, Su W, Zhang S, et al. Factors influencing the willingness of clinical nurses to participate in narrative nursing: a cross-sectional study. *J Adv Nurs* 2024; 81: 1924–1936. <https://doi.org/10.1111/jan.16434>
 18. Perrott SB, Murray AH, Lowe J, Mathieson CM. The psychosocial impact of psoriasis: physical severity, quality of life, and stigmatization. *Physiol Behav* 2000; 70: 567–571. [https://doi.org/10.1016/S0031-9384\(00\)00290-0](https://doi.org/10.1016/S0031-9384(00)00290-0)
 19. Vardy D, Besser A, Amir M, Gesthalter B, Biton A, Buskila D. Experiences of stigmatization play a role in mediating the impact of disease severity on quality of life in psoriasis patients. *Br J Dermatol* 2002; 147: 736–742. <https://doi.org/10.1046/j.1365-2133.2002.04899.x>
 20. Jankowiak B, Kowalewska B, Krajewska-Kulak E, Khvorik DF. Stigmatization and quality of life in patients with psoriasis. *Dermatol Ther (Heidelb)* 2020; 10: 285–296. <https://doi.org/10.1007/s13555-020-00363-1>
 21. Sommer R, Mrowietz U, Radtke MA, Schäfer I, von Kiedrowski R, Strömer K, et al. What is psoriasis? Perception and assessment of psoriasis among the German population. *J Dtsch Dermatol Ges* 2018; 16: 703–710. <https://doi.org/10.1111/ddg.13539>
 22. Feldman SR, Malakouti M, Koo JY. Social impact of the burden of psoriasis: effects on patients and practice. *Dermatol Online J* 2014; 20: 13030/qt48r4w8h2. <https://doi.org/10.5070/D3208023523>
 23. Green-Armytage M, Simonds LM, John M, Woodger N. Depictions of acne and psoriasis influence interpersonal aversion. *Psychol Health Med* 2019; 24: 94–100. <https://doi.org/10.1080/13548506.2018.1497188>
 24. Zhou L, Lv H, Yu Y, Shao J, Wu Y, Li X, et al. An inverted U-shaped relationship between work–family conflict and job burnout among village clinic doctors: the moderating effect of information and communication technology use. *BMC Psychiatry* 2024; 24: 761. <https://doi.org/10.1186/s12888-024-06221-0>
 25. Arndt C, Lischetzke T, Crayen C, Eid M. The assessment of emotional clarity via response times to emotion items: shedding light on the response process and its relation to emotion regulation strategies. *Cogn Emot* 2018; 32: 530–548. <https://doi.org/10.1080/02699931.2017.1322039>
 26. Shimazu A, Schaufeli WB, Kubota K, Watanabe K, Kawakami N. Is too much work engagement detrimental? Linear or curvilinear effects on mental health and job performance. *PLoS One* 2018; 13: e0208684. <https://doi.org/10.1371/journal.pone.0208684>
 27. Lawrence LA. Work engagement, moral distress, education level, and critical reflective practice in intensive care nurses. *Nurs Forum* 2011; 46: 256–268. <https://doi.org/10.1111/j.1744-6198.2011.00237.x>
 28. Porfyri GN, Athanasiadou M, Siokas V, Giannoglou S, Skarpari S, Kikis M, et al. Mental health-related stigma discrimination and prejudices among Greek healthcare professionals. *Front Psychiatry* 2022; 13: 1027304. <https://doi.org/10.3389/fpsy.2022.1027304>
 29. Geese F, Bryant-Lukosius D, Zwakhlen S, Hahn S. Advanced practice nurses and their roles in Swiss cancer care: a cross-sectional study. *Semin Oncol Nurs* 2024; 40: 151626. <https://doi.org/10.1016/j.soncn.2024.151626>
 30. Fajrini M, Setiawan A, Sung CM, Chen R, Liu D, Lee CK, et al. Effects of advanced practice nurses on health-care costs, quality of care, and patient well-being: a meta-analysis of randomized controlled trials. *Int J Nurs Stud* 2024; 162: 104953. <https://doi.org/10.1016/j.ijnurstu.2024.104953>
 31. Høegh-Larsen AM, Gonzalez MT, Riererson IA, Husebø SIE, Hofoss D, Ravik M. Nursing students' clinical judgment skills in simulation and clinical placement: a comparison of student self-assessment and evaluator assessment. *BMC Nurs* 2023; 22: 64. <https://doi.org/10.1186/s12912-023-01220-0>
 32. Li LZ, Yang P, Singer SJ, Pfeffer J, Mathur MB, Shanafelt T. Nurse burnout and patient safety, satisfaction, and quality of care: a systematic review and meta-analysis. *JAMA Netw Open* 2024; 7: e2443059. <https://doi.org/10.1001/jama-networkopen.2024.43059>
 33. Galanis P, Vraika I, Fragkou D, Bilali A, Kaitelidou D. Nurses' burnout and associated risk factors during the COVID-19 pandemic: a systematic review and meta-analysis. *J Adv Nurs* 2021; 77: 3286–3302. <https://doi.org/10.1111/jan.14839>
 34. Hu Z, Wang H, Xie J, Zhang J, Li H, Liu S, et al. Burnout in ICU doctors and nurses in mainland China: a national cross-sectional study. *J Crit Care* 2021; 62: 265–270. <https://doi.org/10.1016/j.jcrc.2020.12.029>
 35. Membrive-Jiménez MJ, Velando-Soriano A, Pradas-Hernandez L, Gomez-Urquiza JL, Romero-Béjar JL, Cañadas-De la Fuente GA, et al. Prevalence, levels and related factors of burnout in nurse managers: a multi-centre cross-sectional study. *J Nurs Manag* 2022; 30: 954–961. <https://doi.org/10.1111/jonm.13575>
 36. Bruyneel A, Bouckaert N, Maertens de Noordhout C, Detolenaere J, Kohn L, Pirson M, et al. Association of burnout and intention-to-leave the profession with work environment: a nationwide cross-sectional study among Belgian intensive care nurses after two years of pandemic. *Int J Nurs Stud* 2023; 137: 104385. <https://doi.org/10.1016/j.ijnurstu.2022.104385>
 37. Cohen C, Pignata S, Bezak E, Tie M, Childs J. Workplace interventions to improve well-being and reduce burnout for nurses, physicians and allied healthcare professionals: a systematic review. *BMJ Open* 2023; 13: e071203. <https://doi.org/10.1136/bmjopen-2022-071203>
 38. Mantzorou M, Economou M, Kalokerinou A, Sourtzi P, Zyga S, Politis A, et al. Exploration of the relationship between stigma and burnout among Greek nurses in dementia care. *J Nurs Manag* 2020; 28: 615–624. <https://doi.org/10.1111/jonm.12964>
 39. Gu L, Xu D, Yu M. Mediating effects of stigma on the relationship between contact and willingness to care for people with mental illness among nursing students. *Nurse Educ Today* 2021; 103: 104973. <https://doi.org/10.1016/j.nedt.2021.104973>