

REVIEW ARTICLE

Perceived stigmatisation and reliability of questionnaire in the survivors with burns wound: A systematic review and meta-analysis

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Abstract

Perceived stigmatisation (PS) can cause different effects on burns survivors such as depression, low self-esteem, body image disturbance, and social anxiety. Current systematic review and meta-analysis aimed to determine the average PS among the burns survivor population and the average reliability of the PS questionnaire (PSQ). A comprehensive systematic search was conducted in various international electronic databases, such as Scopus, PubMed, Web of Science, and Persian electronic databases such as Iranmedex, and Scientific Information Database (SID) using keywords extracted from Medical Subject Headings such as “Stigmatisation”, “Burns”, “Reliability”, and “Questionnaire” from the earliest to February 1, 2023. The COSMIN and the Joanna Briggs Institute (JBI) checklists were applied to evaluate the risk of bias. Data analysis was performed in STATA V.14 and JAMOVI v 2.3.24 software. The analysis consisted of two sections. Firstly, the overall weighted average of PS was calculated based on mean and standard deviation. Then, the reliability average of PSQ was calculated with the reliability generalisation method based on the alpha coefficient, questionnaire items, and sample size of each study. Finally, eight articles were included in the quantitative analysis. The results showed the weighted average of PS was 2.14 (ES: 2.14, 95%CI: 1.77-2.51, $Z = 11.40$, $I^2:97.8%$, $P < 0.001$). The average of PS in the factors of confused/staring behaviour, absence of friendly behaviour, and hostile behaviour was 2.36 (ES: 2.36, 95%CI: 2.05-2.67, $Z = 14.86$, $I^2:92.7%$, $P < 0.001$), 2.13 (ES: 2.13, 95%CI: 1.87-2.39, $Z = 16.22$, $I^2:93.8%$, $P < 0.001$) and 2.07 (ES: 2.07, 95%CI: 1.67-2.47, $Z = 10.05$, $I^2:96.5%$, $P < 0.001$), respectively. The analysis showed that the overall coefficient alpha of the PSQ was 0.88 (ES: 0.88, 95%CI: 0.851-0.910,

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$Z = 58.7$, $I^2: 95.04\%$, $P < 0.001$). Also, the alpha coefficient of factors including confused/staring behaviour, absence of friendly behaviour, and hostile behaviour were 0.847 (ES: 0.847, 95%CI: 0.770-0.924, $Z = 21.6$, $I^2:99.13\%$, $P < 0.001$), 0.860 (ES: 0.860, 95%CI: 0.808-0.912, $Z = 32.4$, $I^2:98.02\%$, $P < 0.001$) and 0.899 (ES: 0.899, 95%CI: 0.829-0.968, $Z = 21.33$, $I^2: 0.0\%$, $P < 0.001$), respectively. In sum, the current study showed that the average PS was 2.14 out of 5 points. Most survivors and parents reported confused/staring behaviour as a common perceived behaviour from different individuals. Also, the average reliability of PSQ was 0.88, and it had acceptable reliability. More studies are required to better judge the level of PS among different age groups. Also, the psychometric properties of PSQ in different cultures are an essential issue.

KEYWORDS

burns, meta-analysis, questionnaire, reliability, stigmatisation

Key Messages

- the results showed the weighted average of PS was 2.14 (ES: 2.14, 95%CI: 1.77-2.51, $Z = 11.40$, $I^2:97.8\%$, $P < 0.001$). The analysis showed that the overall coefficient alpha of the PSQ was 0.88 (ES: 0.88, 95%CI: 0.851-0.910, $Z = 58.7$, $I^2: 95.04\%$, $P < 0.001$)
- the average of PS in the factors of confused/staring behaviour, absence of friendly behaviour, and hostile behaviour was 2.36 (ES: 2.36, 95%CI: 2.05-2.67, $Z = 14.86$, $I^2:92.7\%$, $P < 0.001$), 2.13 (ES: 2.13, 95%CI: 1.87-2.39, $Z = 16.22$, $I^2:93.8\%$, $P < 0.001$) and 2.07 (ES: 2.07, 95%CI: 1.67-2.47, $Z = 10.05$, $I^2:96.5\%$, $P < 0.001$), respectively
- also, the alpha coefficient of factors including confused/staring behaviour, absence of friendly behaviour, and hostile behaviour were 0.847 (ES: 0.847, 95%CI: 0.770-0.924, $Z = 21.6$, $I^2:99.13\%$, $P < 0.001$), 0.860 (ES: 0.860, 95%CI: 0.808-0.912, $Z = 32.4$, $I^2:98.02\%$, $P < 0.001$) and 0.899 (ES: 0.899, 95%CI: 0.829-0.968, $Z = 21.33$, $I^2: 0.0\%$, $P < 0.001$), respectively
- in sum, the current study showed that the average PS was 2.14 out of 5 points. Most survivors and parents reported confused/staring behaviour as a common perceived behaviour from different individuals. Also, the average reliability of PSQ was 0.88, and it had acceptable reliability
- more studies are required to better judge the level of PS among different age groups. Also, the psychometric properties of PSQ in different cultures are an essential issue

1 | INTRODUCTION

Burn is a health problem that happens all over the world and it has inappropriate effects on society.¹⁻¹⁴ Burns can be defined as damage to the skin or any organic tissue that is mainly caused by fire, electricity, radioactive, radiation, and chemical substances.¹⁵⁻²⁴ Burn injuries produce some of the most painful patient experiences²⁵⁻⁴⁰ and may result in unpleasant physical and psychological outcomes among patients.⁴¹⁻⁵⁷ Despite major improvements in the treatment of burn survivors, it had different physical and psychological effects such as pain, pruritus,

scars, stress, and shame about scars.⁵⁸⁻⁶² Some patients encounter changes in appearance and function that can disturb family, friends, and social relationships.⁶³ Consequently, most experienced social isolation, rejection, and social behaviour changes such as stigmatising behaviour.⁶⁴⁻⁷¹ Also, perceived stigmatisation (PS) can cause depression, low self-esteem, body image disturbance, social anxiety, inconvenience, and diminished health-related quality of life.^{64,72-78}

Stigmatisation term initially defined as a physical brand or tattoo that makes persons like slaves identifiable and shame feeling from their low social level.⁷⁹

Nowadays, stigmatisation referred to a process or situation a person experienced and felt unable to reach social acceptance.⁸⁰⁻⁸⁵ People with burn scars can experience stigmatisation behaviour that may be quite overt such as staring, startled reaction, and whispering, or more subtle including avoiding eye contact, ignoring, and walking faster when approaching.^{62,64,67,86}

Researchers suggested some approaches to decrease PS by improving the knowledge, attitude, and behaviour of survivors and their families, friends, and other people.⁸⁷⁻⁹⁰ Group counselling,⁹¹ video workshops,⁹² community-based education like posters, and⁹³ decreasing visible scars by prescription of medication and surgery⁹⁴ are some interventions to reduce PS in burn patients.

Before the design of the intervention, the measurement of PS is essential. Various questionnaires were developed to measure the level of PS among burn survivors. Lawrence et al. (2006) developed the PS questionnaire (PSQ) for adult and paediatric burn survivors in the USA.⁶² This scale had 21 items and three sub-scales including confused/staring behaviour, absence of friendly behaviour, and hostile behaviour.^{62,95,96} The respondents determined their experiences of stigmatisation behaviours on a 5-point Likert scale. Numbers 1,2,3,4, and 5 were attributed to never, rarely, sometimes, often, and always, respectively. The total score is computed by adding all the item responses and dividing by the total number of items. Higher scores indicated a greater PS behaviour.⁹⁷

The psychometric properties of the PSQ were assessed in various studies.^{62,95,98,99} Reliability was considered a pivotal component of psychometric properties. Test-retest, interrater, split-half, and internal consistency are methods to measure reliability. Internal consistency test was estimated with alpha coefficient and used in most studies due to ease of execution. The value of the alpha coefficient varied between 0 and 1. The alpha coefficient value above 0.70 was considered acceptable for the scale.¹⁰⁰ The purpose of a reliability meta-analysis is to estimate the mean reliability and look for moderator variables that can account for part of the variance in the scale.¹⁰¹ Also, some studies evaluated the levels of PS among burns patients and different values were reported.^{96,102,103} The averages of total PS and factors were not estimated in the review study.

2 | RESEARCH QUESTIONS

- What is the mean score of the PS in the survivors with burns wound?
- What is the mean score of reliability of the PS' questionnaire in the survivors with burns wound?

2.1 | Aim

Therefore, based on the importance and different reported PS results, our research team conducted this systematic review and meta-analysis to examine the average PS and reliability of the PSQ in burn survivors.

3 | METHODS

3.1 | Study registration and reporting

This systematic review was carried out utilising the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.¹⁰⁴ Additionally, the current review was not registered in the database of international prospective register of systematic reviews (PROSPERO) database.

3.2 | Search strategy

A comprehensive systematic search was conducted in various international electronic databases, such as Scopus, PubMed, Web of Science, and Persian electronic databases such as Iranmedex, and Scientific Information Database (SID) using keywords extracted from Medical Subject Headings such as “Stigmatisation”, “Burns”, “Reliability”, and “Questionnaire” from the earliest to February 1, 2023. For example, the search strategy was in PubMed/MEDLINE database including ((“Stigma”) OR (“Stigmatisation”)) AND ([“Burns”]) AND ((“Validity”) OR (“Reliability”) OR (“Psychometrics”)) AND ((“Questionnaire”) OR (“Scale”) OR (“Tool”)). To combine terms, the Boolean operators “OR” and “AND” were used. Iranian electronic databases were also searched for Persian keyword equivalents. A thorough search was conducted by two researchers separately. This systematic review does not include grey literature, such as expert opinions, conference presentations, theses, research reports, and ongoing research. Articles that have been electronically published but have not been subject to a for-profit publisher's review are referred to as “grey literature”.¹⁰⁵

3.3 | Inclusion and exclusion criteria

Inclusion criteria were studies that reported the level of PS or alpha coefficient based on PSQ among burns survivors without limits of age groups. Also, exclusion criteria were: not having access to the full text of the article, and a letter to the editor, editorial, and review studies.

3.4 | Study selection

EndNote 8X was used to manage the data for this systematic review. The studies for this review were chosen separately by the two researchers based on the inclusion and exclusion criteria. By examining each article's title, abstract, and full text, duplicate articles were first eliminated. This operation was then completed manually to avoid data loss. While choosing the studies, the third researcher settled any differences between the first two researchers. To avoid data loss, references were lastly thoroughly reviewed.

3.5 | Data analysis

Data analysis was performed in STATA V.14 and JAMOVI v 2.3.24 software. Heterogeneity was assessed with the I^2 value. I^2 more than 50% was considered as considerable heterogeneity and the random effect model was used for analysis. Also, the analysis consisted of two sections. Firstly, the overall weighted average of PS was calculated based on mean and standard deviation. In the second section, the overall average reliability of PSQ was calculated based on the reliability generalisation method. This method was proposed to calculate reliability in the meta-analysis based on coefficient alpha. For reporting this outcome, the alpha coefficient value, questionnaire items, and sample size of each study were extracted from the included studies and imported into JAMOVI software. The COSMIN and the Joanna Briggs Institute (JBI) checklists were applied to

evaluate the risk of bias for PSQ meta-analysis reliability and weighted mean of PS in burn patients.

4 | RESULTS

4.1 | Study selection

A comprehensive search of electronic databases turned up 424 studies. 80 studies were removed from the research because they were duplicates. This systematic review had 344 papers in total, but 285 articles were removed since they did not promote the goals of the study. Eight research were deleted due to insufficient data, and four studies were discarded for other reasons during the analysis of the full texts of the publications. Finally, eight articles were included in the quantitative analysis (Figure 1).

4.2 | Study characteristics

As shown in Tables 1 and 2, three studies measured the average of PS and five studies measured the reliability of the PSQ based on coefficient alpha.

4.3 | Methodological quality assessment of eligible studies

As shown in Tables 3 and 4, to assess the risk of bias, the COSMIN, and JBI checklists were used.

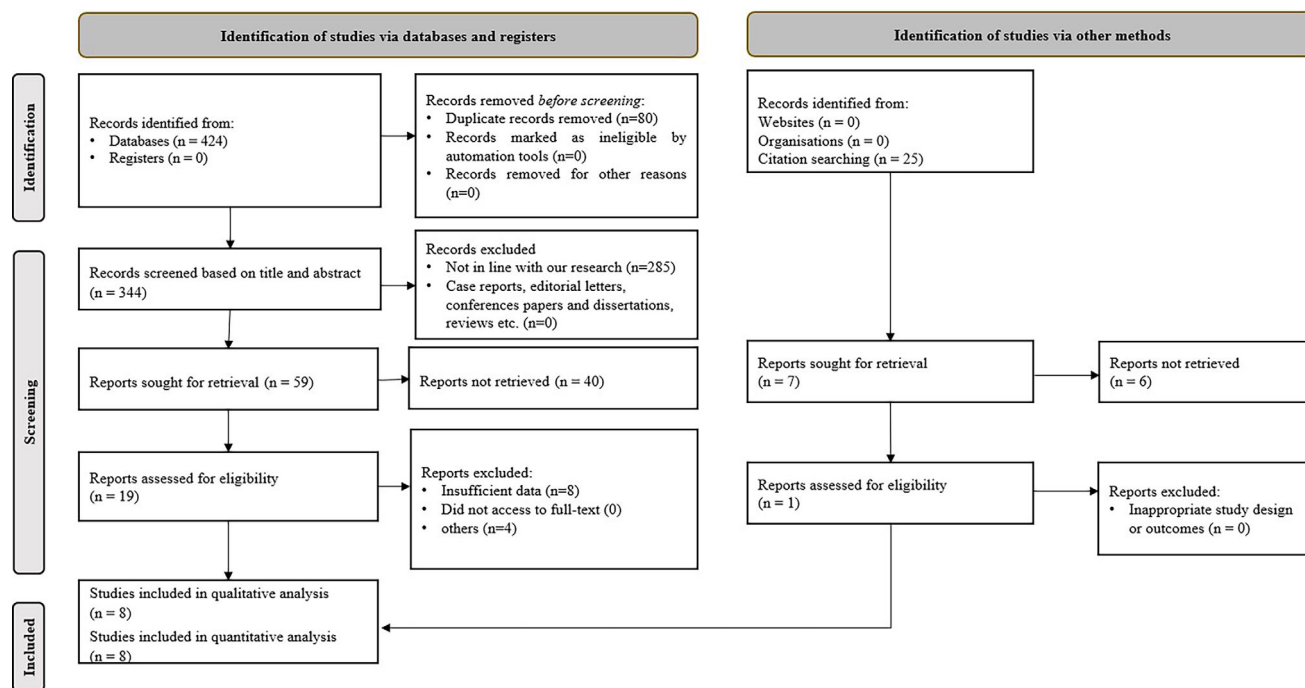


FIGURE 1 Flow diagram of the study selection process.

TABLE 1 Characteristics included studies for the average PS.

First author Year Country	Age (mean ± SD) Age range(year) M/F ratio Population	Design Sampling Sample size	PSQ total score (mean ± SD)	PSQ factors score (mean ± SD) Confused/staring behaviour Absence of friendly behaviour Hostile behaviour
<ul style="list-style-type: none"> Freitas 2020 Brazil¹⁰³ 	<ul style="list-style-type: none"> 38.4 ± 14.4 ≥18 year 132/110 Adults 	<ul style="list-style-type: none"> Cross-sectional Convenience 240 	2.0 (0.7)	<ul style="list-style-type: none"> 2.3 (1.2) 1.9 (0.6) 1.6 (0.8)
<ul style="list-style-type: none"> Armstrong 2018 UK¹⁰² 	<ul style="list-style-type: none"> 13.7 ± 1.75 8–17 year 8/15 Paediatrics 	<ul style="list-style-type: none"> Mixed-method Non-randomization 23 	1.99 (0.60)	<ul style="list-style-type: none"> 2.05 (0.84) 2.12 (0.62) 1.70 (0.79)
<ul style="list-style-type: none"> Lawrence 2011 USA⁹⁶ 	<ul style="list-style-type: none"> Not reported ≥18 year 17/68 Parents 	<ul style="list-style-type: none"> Cross-sectional Convenience 83 	1.96 (0.52)	<ul style="list-style-type: none"> 2.24 (0.69) 2.11 (0.66) 2.07 (0.73)
<ul style="list-style-type: none"> Lawrence 2011 USA⁹⁶ 	<ul style="list-style-type: none"> 13.3 ± 2.5 7.5 ± 4.1 8–18 year 53/32 (Two participants Removed) Paediatrics 	<ul style="list-style-type: none"> Cross-sectional Convenience 83 	2.6 (0.36)	<ul style="list-style-type: none"> 2.77 (0.59) 2.39 (0.54) 2.63 (0.69)

Abbreviations: M/F, male/female; N/A, not applicable; PSQ, perceived stigmatisation questionnaire.

4.4 | Level of PS in the survivors with burns wound

4.4.1 | General information

Among the included studies is the Lawrence study (2011) reported the level of PS from the perspective of parents and children.⁹⁶ The three studies that reported PS were from the UK, USA, and Brazil, and the total sample also was 429 people (Table 1).

4.4.2 | Overall PS

The results showed the weighted average of PS was 2.14 (ES: 2.14, 95%CI: 1.77-2.51, Z = 11.40, I²:97.8%, P < 0.001) (Figure 2). The average of PS in the factors of confused/staring behaviour, absence of friendly behaviour, and hostile behaviour was 2.36 (ES: 2.36, 95%CI: 2.05-2.67, Z = 14.86, I²:92.7%, P < 0.001), 2.13 (ES: 2.13, 95%CI: 1.87-2.39, Z = 16.22, I²:93.8%, P < 0.001) and 2.07 (ES: 2.07, 95%CI: 1.67-2.47, Z = 10.05, I²:96.5%, P < 0.001), respectively.

4.4.3 | Sensitivity analysis for the assessment of PS in the survivors with burns wound

The results of the sensitivity analysis showed that the removal of each study had a different effect on the CI (95%CI: 1.7-2.68). Removing Lawrence's study (2011) that

measured PS from the perspective of the burn victim parents, lead to a narrow CI (ES:1.98, 95%CI: 1.92-2.05).

4.4.4 | Publication bias for assessment of PS in the survivors with burns wound

The funnel plot showed an asymP <metric view (Figure 3), although the Eggert test did not show a significant requirement to perform the trim and fill method (P = 0.540).

4.5 | Reliability of PSQ in the survivors with burns wound

4.5.1 | General information

Among the studies included to calculate overall reliability, two studies were conducted in the USA and three other studies were performed in Brazil, Netherlands, and Germany. The total sample size was 3815 burns victim (Table 2).

4.5.2 | Overall reliability

The analysis showed that the overall coefficient alpha of the PSQ was 0.88 (ES: 0.88, 95%CI: 0.851-0.910, Z = 58.7, I²: 95.04%, P < 0.001) (Figure 4). Also, the alpha coefficient of factors including confused/ staring behaviour,

TABLE 2 Characteristics included studies for the reliability of PSQ.

First author Year Location	Age (mean ± SD) Age range (year) M/F ratio Population	Design Sampling Sample size	Items Factors	Coefficient alpha Total Confused/staring behaviour Absence of friendly behaviour Hostile behavior
<ul style="list-style-type: none"> • Willemse • 2020 • Netherlands and Belgium¹⁰⁶ 	<ul style="list-style-type: none"> • 46.50 ± 15.50 (time of burn) • 19–82 year • 120/54 • Adults 	<ul style="list-style-type: none"> • Prospective longitudinal • Non-random • 174 	<ul style="list-style-type: none"> • 21 • 4 	<ul style="list-style-type: none"> • 0.85 • 0.88 • N/A • 0.72
<ul style="list-style-type: none"> • Freitas • 2018 • Brazil⁹⁷ 	<ul style="list-style-type: none"> • 38.4 ± 14.4 • ≥18 year • 132/108 • Adults 	<ul style="list-style-type: none"> • Cross-sectional • Non-random • 240 	<ul style="list-style-type: none"> • 18 • 3 	<ul style="list-style-type: none"> • 0.88 • 0.65 • 0.80 • 0.78
<ul style="list-style-type: none"> • Muller • 2016 • Germany⁹⁹ 	<ul style="list-style-type: none"> • 49.69 ± 15.16 • ≥18 year • 90/49 • Adults 	<ul style="list-style-type: none"> • Cross-sectional • Non-random • 139 	<ul style="list-style-type: none"> • 21 • 3 	<ul style="list-style-type: none"> • 0.86 • 0.90 • 0.84 • 0.71
<ul style="list-style-type: none"> • Lawrence • 2010 • USA⁹⁵ 	<ul style="list-style-type: none"> • 45.4 ± 12.6 • ≥19 year • 167/180 • Adults 	<ul style="list-style-type: none"> • Cross-sectional • Non-random • 347 	<ul style="list-style-type: none"> • 21 • 3 	<ul style="list-style-type: none"> • 0.91 • 0.91 • 0.92 • 0.89
<ul style="list-style-type: none"> • Lawrence • 2010 • USA⁹⁵ 	<ul style="list-style-type: none"> • 13.5 ± 2.4 • 8–18 year • 163/206 • 206/163 • Children 	<ul style="list-style-type: none"> • Cross-sectional • Non-random • 369 	<ul style="list-style-type: none"> • 21 • 3 	<ul style="list-style-type: none"> • 0.84 • 0.81 • 0.81 • 0.89
<ul style="list-style-type: none"> • Lawrence • 2006 • USA⁶² 	<ul style="list-style-type: none"> • 44.1 ± 13.6 • N/A • (52% women) • Adults 	<ul style="list-style-type: none"> • Cross-sectional • Non-random • 361 	<ul style="list-style-type: none"> • 21 • 3 	<ul style="list-style-type: none"> • 0.93 • 0.91 • 0.92 • 0.88

absence of friendly behaviour, and hostile behaviour were 0.847 (ES: 0.847, 95%CI: 0.770-0.924, $Z = 21.6$, $I^2:99.13\%$, $P < 0.001$), 0.860 (ES: 0.860, 95%CI: 0.808-0.912, $Z = 32.4$, $I^2:98.02\%$, $P < 0.001$) and 0.899 (ES: 0.899, 95%CI: 0.829-0.968, $Z = 21.33$, $I^2: 0.0\%$, $P < 0.001$), respectively. The study of Willemse (2021) divided friendly behaviours into two factors: absence-friendly behaviour in general with five items and absence-friendly behaviour in strangers with three items.¹⁰⁶ So, this study was not considered in the analysis to report the overall reliability of the factor of friendly behaviour.

4.5.3 | Sensitivity analysis for assessment of reliability of PSQ in the survivors with burns wound

The results of the sensitivity analysis showed that the exclusion of each study had a different effect on the effect size and CI (95%CI: 0.81-0.92).

4.5.4 | Publication bias for assessment of reliability of PSQ in the survivors with burns wound

The analysis of the funnel plot showed an asymmetric view of bias in the included effect sizes of overall reliability (Figure 3). Also, the Eggert test showed that the publication bias is quantitatively significant ($P = 0.006$). Although the trim and fill method did not indicate missed study.

5 | DISCUSSION

Current systematic review and meta-analysis aimed to determine the average PS among burns patients based on PSQ and reliability of PSQ using the alpha coefficient.

Results showed total PS was 2.14 out of 5. One study compared PS among burn survivors with the general population. The results indicated that the PS level among burns survivors was higher than in another group (2 vs.

TABLE 3 Risk of bias included study based on COSMIN checklist.

Items	Willemse (2020)	Freitas (2018)	Muller (2016)	Lawrence (2010)	Lawrence (2006)
Does the scale consist of effect indicators, that is, is it based on a reflective model?	+	+	+	+	+
Was the percentage of missing items given?	?	+	+	+	+
Was there a description of how missing items were handled?	?	+	+	+	+
Was the sample size included in the internal consistency analysis adequate?	+	+	+	+	+
Was the unidimensionality of the scale checked?	+	+	+	+	+
Was the sample size included in the unidimensionality analysis adequate?	+	+	+	+	+
Was an internal consistency statistic calculated for each (unidimensional) (sub)scale separately?	+	+	+	+	+
Were there any important flaws in the design or methods of the study?	-	-	-	-	-
for Classical Test Theory (CTT): Was Cronbach's alpha calculated?	+	+	+	+	+
for dichotomous scores: Was Cronbach's alpha or KR-20 calculated?	N/A	N/A	N/A	N/A	N/A
for IRT: Was a goodness of fit statistic at a global level calculated? for example, χ^2 , a reliability coefficient of estimated latent trait value (index of [subject or item] separation)	+	+	+	+	+

Note: +, yes; -, no; ?, unclear; N.A, not applicable.

TABLE 4 Risk of bias included study based on JBI checklist.

Items	Freitas (2020)	Armstrong (2018)	Lawrence (2011)
Was the sample frame appropriate to address the target population?	+	+	+
Were study participants sampled appropriately?	+	+	+
Was the sample size adequate?	+	-	-
Were the study subjects and the setting described in detail?	+	+	+
Was the data analysis conducted with sufficient coverage of the identified sample?	+	+	+
Were valid methods used for the identification of the condition?	+	+	+
Was the condition measured in a standard, reliable way for all participants?	-	-	-
Was there an appropriate statistical analysis?	+	+	+
Was the response rate adequate, and if not, was the low response rate managed appropriately?	+	+	+

Note: +, yes; -, no; ?, unclear; N.A, not applicable.

1.9), which was marginally significant.¹⁰³ Some cultures overemphasise appearance, which can lead to greater PS among burn victims. Planning the interventions, implementation, and advertisement in social media to inform

the general population about the effects of their attention on burn survivors can change this culture.

Comparing the three factors of PSQ indicated that scores in the confused/staring behaviour were the highest

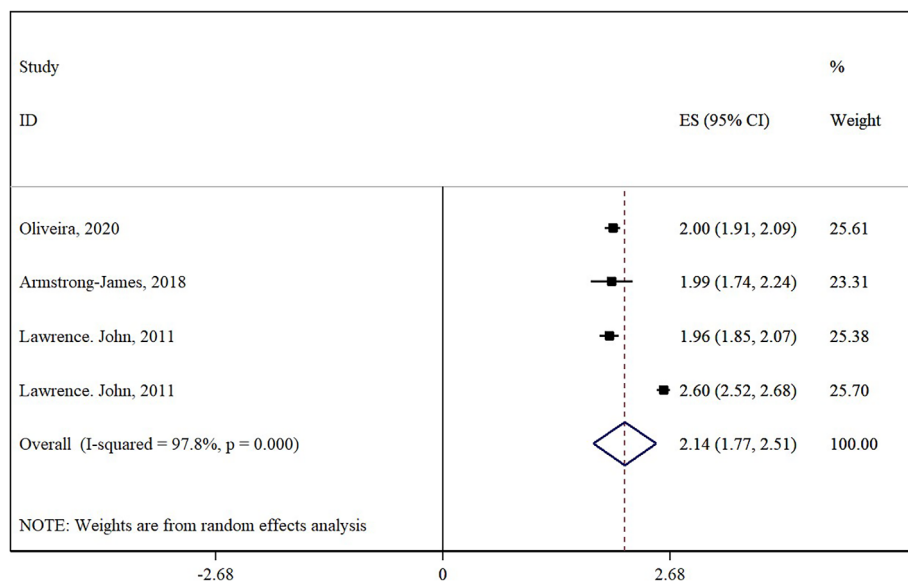


FIGURE 2 Forest plot of PS average.

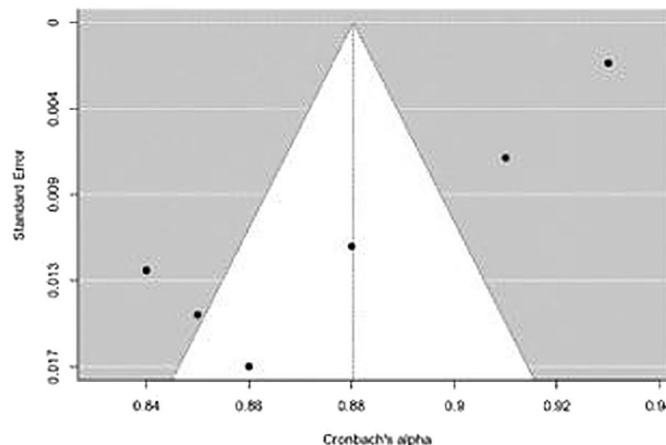
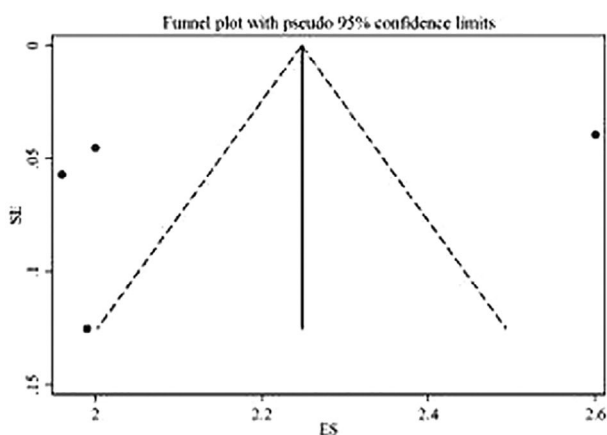


FIGURE 3 Funnel plots of PS average (left) and PSQ reliability (right).

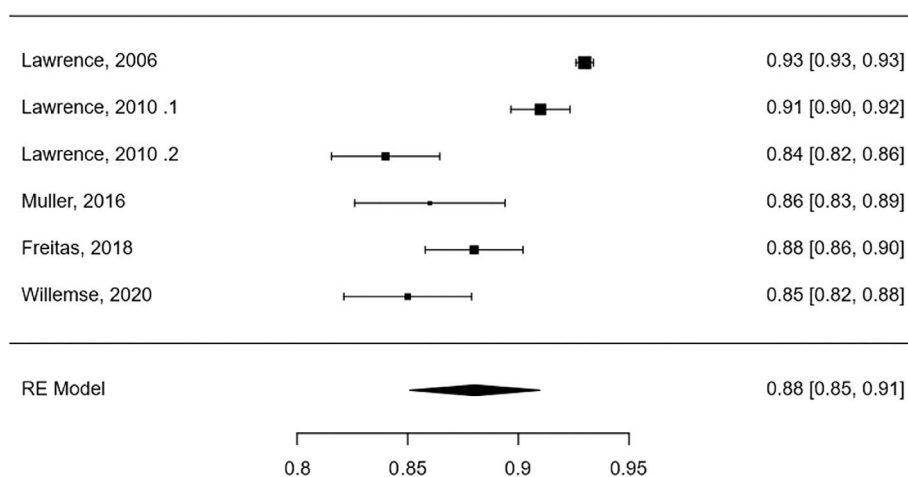


FIGURE 4 Forest plot of PSQ overall reliability.

and the hostile behaviour had the lowest level. So, people displayed behaviours such as avoiding looking, being surprised action, and feeling sorry and embarrassed when

encountering burns survivors. These reactions included some items of confused/staring behaviour factor from the PSQ.⁶² On the other hand, hostile behaviours including

laughing, bullying, and funning were less common among people when faced with burns victims. These behaviours had adverse effects such as social isolation, loneliness, and fewer interpersonal relationship opportunities with peers of burns survivors.¹⁰⁷ Also, Lawrence et al. emphasised that the level of PS between parents of victims differed from that of burns survivors, so it was lower in the parents.⁹⁶ As a result, staff treatment cannot rely solely on the parental report about the psychological effects of burns among survivors, and the paediatric perspective must be sought.

Limited studies reported PS among burns victims, so we did not exclude paediatrics from this review study. Two studies were performed on paediatrics^{96,102} and another on adults.¹⁰³ It should be considered that age groups can affect PS. Future studies can compare paediatric and adult levels of PS.

Also, the results of the current study showed that the average reliability of PSQ was 0.88 based on the alpha coefficient. This value indicated acceptable reliability. Although the alpha coefficient was used to check the internal consistency reliability, other indicators of psychometric properties, such as test-retest reliability and factor analysis should be noticed.¹⁰⁰ In one study, the number of factors changed from three to four after confirmatory factor analysis. Also, in another study items were reduced from 21 to 18. These changes indicated that researchers should be determined psychometric properties in different cultures. Also, the results of the alpha coefficient for sub-scales were in the acceptable range based on this meta-analysis.

6 | LIMITATIONS

Sub-group analysis was not performed due to the low number of included studies. However, the results can create an idea for future research. We evaluated reliability based on the alpha coefficient, which is considered one of the reliability dimensions.

6.1 | Recommendations for future research

It is imperative to conduct further research to better assess PS levels between different age groups, and it is also essential to investigate the psychometric characteristics of PSQ across cultures to make accurate assessments.

7 | CONCLUSION

This systematic review and meta-analysis aimed to determine the level of PS among burn survivors and the

average reliability of PSQ. Results of the current study showed that the average PS was 2.14 out of 5 points. Most survivors and parents reported confused/starring behaviour as a common perceived behaviour from different individuals. Also, the average reliability of PSQ was 0.88, and it had acceptable reliability. More studies are required better judge the level of PS among different age groups. Also, the psychometric properties of PSQ in other cultures are an essential issue.

AUTHOR CONTRIBUTIONS

All authors: idea for the review, study selection, data extraction, interpretation of results, writing of the manuscript. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

We do not have potential conflicts of interest with respect to the research, authorship, and publication of this article.


DATA AVAILABILITY STATEMENT

The datasets used during the current study are available from the corresponding author upon request.

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