



## Perceived stigmatization and fear of negative evaluation: Two distinct pathways to body image dissatisfaction and self-esteem in burn survivors

Heidi Willemse, Rinie Geenen, Marthe R. Egberts, Iris M. Engelhard & Nancy E. Van Loey

To cite this article: Heidi Willemse, Rinie Geenen, Marthe R. Egberts, Iris M. Engelhard & Nancy E. Van Loey (2023) Perceived stigmatization and fear of negative evaluation: Two distinct pathways to body image dissatisfaction and self-esteem in burn survivors, *Psychology & Health*, 38:4, 445-458, DOI: [10.1080/08870446.2021.1970160](https://doi.org/10.1080/08870446.2021.1970160)

To link to this article: <https://doi.org/10.1080/08870446.2021.1970160>



© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 26 Aug 2021.



Submit your article to this journal [↗](#)



Article views: 520





View related articles [↗](#)



View Crossmark data [↗](#)

# Perceived stigmatization and fear of negative evaluation: Two distinct pathways to body image dissatisfaction and self-esteem in burn survivors

Heidi Willemse<sup>a,b</sup>, Rinie Geenen<sup>b</sup>, Marthe R. Egberts<sup>b</sup> , Iris M. Engelhard<sup>b</sup> and Nancy E. Van Loey<sup>a,b</sup> 

<sup>a</sup>Department of Behavioural Research, Association of Dutch Burn Centres, Beverwijk, The Netherlands;

<sup>b</sup>Department of Clinical Psychology, Utrecht University, Utrecht, The Netherlands

## ABSTRACT

**Objective:** Scars resulting from burn injury can pose social and psychological problems that may affect body image and self-esteem. This study aimed to investigate whether burn severity, age and female gender are associated with body image dissatisfaction and self-esteem, through an association with perceived stigmatization and fear of negative evaluation.

**Design & Main Outcome Measures:** Burn survivors (N=224) completed the Fear of Negative Evaluation scale (FNE) and the Perceived Stigmatization Questionnaire (PSQ) at 3 months post-burn, and the Rosenberg Self-Esteem scale (RSE) and the Satisfaction with Appearance scale (SWAP) at 6 months post-burn. Path analysis was used to test the relationships.

**Results:** Body image dissatisfaction and self-esteem were moderately associated. Burn severity was directly and indirectly associated with body image dissatisfaction through perceived stigmatization. Female gender and age were indirectly associated with body image dissatisfaction through fear of negative evaluation. Age was indirectly associated with both perceived stigmatization and fear of negative evaluation. Perceived stigmatization and fear of negative evaluation were associated with self-esteem through body image dissatisfaction, the first indirectly and the latter both directly and indirectly.

**Conclusions:** Findings highlight that both burn-specific factors and psychological vulnerability should be taken into account to deal with social challenges that may affect body image and self-esteem after burns.

## ARTICLE HISTORY

Received 1 December 2020

Accepted 11 August 2021

## KEYWORDS

burn;  
social;  
psychological;  
stigmatization;  
fear of negative  
evaluation;  
self-esteem;  
body image  
dissatisfaction

## 1. Introduction

Scars caused by burns can pose social and psychological challenges (Marino et al., 2017) in a society where a high premium is placed on physical appearance, which in

**CONTACT** Nancy Van Loey  [nvanloey@burns.nl](mailto:nvanloey@burns.nl)  Department of Behavioural Research, Association of Dutch Burn Centres, PO Box 1015, Beverwijk, 1940 EA, The Netherlands

© 2021 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

turn may affect body image and self-esteem (Lawrence et al., 2004; Martin et al., 2017; Thombs et al., 2008). Body image can be regarded as domain-specific self-esteem (Sowislo & Orth, 2013) involving perceptions about and satisfaction with one's physical appearance (Cash et al., 2005; Thombs et al., 2008), whereas self-esteem can be regarded as a more global, encompassing evaluation of the self (Leary & Baumeister, 2000a). In the burns literature, body image dissatisfaction has been most often studied (Hodder et al., 2014; Lawrence et al., 2004; Thombs et al., 2008), whereas self-esteem has received little attention. The role of psychological vulnerabilities and the social environment in relation to self-evaluations, particularly after a changed appearance, is of importance to understand psychological adjustment after burns. In the current study, we investigated whether psychological and social factors have a unique relationship with self-esteem beyond its relationship with body image dissatisfaction in a population of burn survivors.

The impact of social factors on body image and self-esteem is well-established and included in leading theories. According to Cash' cognitive behavioral model of body image, physical characteristics and changes, and interpersonal relationships are among the factors that can negatively influence body image, particularly when appearance does not match cultural norms of attractiveness, and by critical comments about one's appearance (Cash, 2012; Cash et al., 2005). Theories of self-esteem such as Sociometer theory (Leary & Baumeister, 2000a), emphasize the importance of successful interactions and feeling socially connected for shaping self-esteem. This theory puts forward that self-esteem functions as a monitor or gauge that appraises others' reactions to the self, indicating that self-esteem may fluctuate along with approval of others. These assumptions are supported by findings from a meta-analysis in which a reciprocal relationship between self-esteem and social relationships was established in all developmental stages across the life span (Harris & Orth, 2020).

Stigmatizing behavior is one of the social challenges that burn survivors may encounter. Studies document that stigmatizing behavior, e.g., being stared at and being asked intrusive questions (Martin et al., 2017), commonly occurs in the aftermath of burn injuries and has been shown to be associated with body image dissatisfaction (Lawrence et al., 2012; Thombs et al., 2008). This subscribes Cash' cognitive behavioral model (Cash, 2012). Burn severity and burns to visible areas such as face and hands are associated with greater perception of stigmatization and/or body image dissatisfaction (Huang & Su, 2020; Ross et al., 2021; Sinha et al., 2019). More specifically, research has indicated that stigmatizing behavior mediates the relationship between subjective scar severity and body image dissatisfaction (Lawrence et al., 2004), showing the relevance of a social component in explaining the impact of burn severity on self-evaluations. In line with Sociometer theory (Leary & Baumeister, 2000a), self-esteem may also be negatively affected by perceived stigmatization linked to burn scars when it is experienced as potential rejection or disapproval from others. Therefore, one may assume that more severe burns can elicit more stigmatizing behaviors, that in turn potentially affect both body image and global self-esteem.

Besides a relationship with burn severity, research has shown that women with burns are more likely to experience body image dissatisfaction compared to men (Al Ghriwati et al., 2017; Thombs et al., 2008), but they do not necessarily experience greater stigmatization, as reported by e.g., Müller et al. (2016) and Freitas et al. (2018),

while one study reported they did (Ross et al., 2021). Greater body image dissatisfaction in women with burns has been explained by importance of appearance which is higher in women (Thombs et al., 2008). This may suggest a greater role of self-esteem contingent on evaluation of appearance in women. This is in line with the assumption that when appearance is highly valued, it comprises a larger part of self-esteem (Cash, 2011). Given the higher frequency of body image dissatisfaction in women with burns and the finding that the connection between stigmatization and body image dissatisfaction was found for both men and women with a visible difference (Crandall et al., 2020), psychological vulnerability factors may be of importance in explaining the impact of scars on self-evaluations particularly in women.

This vulnerability may relate to higher levels of fear of negative evaluation which is defined as the 'sense of dread associated with being evaluated unfavorably while anticipating or participating in a social situation' (Weeks et al., 2010). Fear of negative evaluation is implicated in social anxiety and lower self-esteem (Junghans-Rutelonis et al., 2015; Leary, 2015). In burn survivors, changed appearance may increase anticipation of negative evaluation and fear of being rejected, which may lead to anxiety and self-consciousness (Macleod et al., 2016), affecting body image dissatisfaction and self-esteem. Increased appearance anxiety may be particularly common in women, considering the evidence that women's self-worth may be more contingent on their physical appearance (Adams et al., 2017; Grossbard et al., 2009). Given the large body of evidence showing that women are more vulnerable to body image dissatisfaction and lower self-esteem in appearance-related conditions, women may experience more fear of negative evaluation and this may negatively impact body image and self-esteem.

In general, body image satisfaction and self-esteem are higher in older adults compared to young adults, but across all life stages, the relationship with social interactions has been established (Barnett et al., 2020; Orth et al., 2018). One study investigating body image dissatisfaction in adolescents and adults with burns showed that body image was more positive in adolescents (Lawrence et al., 2006). In contrast, a study suggested that burns in adulthood were less life-changing than childhood burns (Hodder et al., 2014). However, age in relation to body image dissatisfaction and self-esteem after burns was not often subject of study, as shown in a recent review (Cleary et al., 2020). Relating to the broader literature, it may be conceivable that younger age is associated with higher body image dissatisfaction and lower self-esteem, particularly in burn survivors with a changed appearance.

In the current study, 224 patients with burns completed assessments 3 and 6 months post-burn. Using path analysis, we tested direct and indirect relationships of burn severity, gender and age with body image dissatisfaction and self-esteem through perceived stigmatization and fear of negative evaluation. First, we hypothesized that burn severity is related to body image dissatisfaction through perceived stigmatization and that the latter is also related to self-esteem. Second, we hypothesized that female gender is related to body image dissatisfaction through fear of negative evaluation, and the latter is also related to self-esteem. Third, we expected that body image dissatisfaction is associated with low self-esteem and that all variables (burn severity, gender, age, fear of negative evaluation, and perceived stigmatization) are indirectly

related to self-esteem through body image dissatisfaction. We also explored associations between burn severity, age and fear of negative evaluation, and between gender, age and perceived stigmatization.

## 2. Materials & methods

### 2.1. Participants and procedure

This study is part of a larger longitudinal multi-center project examining the social impact of burn injuries. Patients were included between October 2013 and October 2015 during admission to the hospital and were longitudinally followed for 18 months. Data collected at 3 and 6 months were used in this study. During their stay in the hospital patients were invited to participate in the study by a local researcher, who gave oral and written information about the study. All participants gave written consent. After discharge, they received follow-up questionnaires at their home address. The inclusion criteria for participation were: hospital stay of >24 h following the burn event, age of 18 years or older and proficiency in Dutch. Exclusion criteria were: problems that interfere with the comprehension of questionnaires (e.g., psychosis, cognitive problems), and inhalation injury without external burns. The study was approved by institutional ethics committees in the Netherlands and Belgium (NL44682.094.13 and B670201420373).

The initial sample consisted of 266 patients admitted to one of six burn centers in the Netherlands and Belgium. Forty-two patients (16%) did not complete any of the measures that constitute the dependent variables of the model and were excluded from the analyses, leaving a final sample of 224. The 42 dropouts had smaller burns in terms of percentage total body surface area (TBSA) burned ( $M=6.83$  vs  $M=10.23$ ;  $t(114.34) = 2.89$ ,  $p = .005$ ), but there was no difference regarding gender ( $F(1,264) = 1.91$ ,  $p = .17$ ) and number of surgeries ( $t(264) = 1.06$ ,  $p = .29$ ). There was a tendency for dropouts to be somewhat younger than completers ( $M=39.68$  vs  $M=44.69$ ;  $t(263) = 1.90$ ,  $p = .059$ ).

Of the 224 respondents, most were male ( $n=158$ ; 70.5%). Their mean age at the time of injury was 44.69 years ( $SD=15.68$ ; range 18–82), and mean TBSA burned was 10.23 ( $SD=11.54$ , range: 0.40–75). About half of the respondents did not need skin graft transplantations ( $n=104$ ; 46.4%), 77 needed one surgery (34.4%) and 43 respondents needed two or more surgeries (19.2%). Regarding visibility of the burns, 116 respondents (51.8%) had facial burns as registered in the acute phase. Of the 224 respondents, 170 (76%) completed all measures. Respondents with complete data did not differ significantly in terms of gender ( $\chi^2(1) = 1.96$ ,  $p = .16$ ), age ( $t(222) = .30$ ,  $p = .77$ ) or TBSA burned ( $t(222) = -.03$ ,  $p = .98$ ) from respondents with missing data at one of the measurements.

### 2.2. Materials

#### 2.2.1. Patient and burn characteristics

Characteristics of the patient (i.e., gender and age) and the burn (i.e., percentage total body surface area (TBSA) burned, number of surgeries during initial

hospitalization) were derived from the medical file. TBSA burned is the estimated percentage body surface area affected by partial and full-thickness burns.

### **2.2.2. Self-esteem**

Rosenberg's Self-esteem scale (RSES) was used to measure participants' self-esteem (Rosenberg, 1989) 6 months post-burn. It is composed of 10 items of which 5 items are positively worded (e.g., 'I feel that I am a person of worth, at least on an equal plane with others') and 5 are negatively worded (e.g., 'I feel I do not have much to be proud of'). A 4-point Likert scale is used, ranging from 0 (strongly agree) to 3 (strongly disagree). The positively worded items are reverse coded so that higher scores indicate a higher self-esteem. The scale has good psychometric properties (Sowislo & Orth, 2013), which is also the case for the validated Dutch-language version (Franck et al., 2008). Cronbach's alpha for the current sample was .90, which indicates high internal consistency. RSES does not include any item referring to appreciation of the body.

### **2.2.3. Body image dissatisfaction**

The Satisfaction with Appearance Scale (SWAP) was used to assess two primary components of body image after burns, i.e., subjective satisfaction with appearance and social-behavioral impact of burn scars, referred to as body image dissatisfaction (Lawrence et al., 1998). The scale was administered 6 months post-burn. The scale comprises 14 items (e.g., 'Changes in my appearance have interfered with my relationships'). A previous study on body image in Dutch adolescents with burns examined the factor structure of the Dutch translation of this scale (Bakker et al., 2011). The current study used this Dutch version. Items are scored on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Six items are reverse coded so that higher scores indicate greater dissatisfaction with appearance. Cronbach's alpha was .92 for the current patient sample, demonstrating high internal consistency.

### **2.2.4. Perceived stigmatization**

The Perceived Stigmatization Questionnaire (PSQ) (Lawrence et al., 2006) was administered 3 months post-burn. It consists of 21 items (e.g., 'People seem to be uncomfortable with my appearance') scored on a 5-point Likert scale, ranging from 1 (never) to 5 (always) with a recall period of 3 months. There are three subscales: absence of friendly behavior, confused and staring behavior, and hostile behavior. Items from the first subscale are reverse coded, so higher scores indicate more perceived stigmatization. The sum score was calculated. The PSQ has good internal consistency, with a Cronbach's alpha of .93 for the total scale. It has demonstrated good discriminant and convergent validity (Lawrence et al., 2006; Thombs et al., 2008). The scale was translated into Dutch by two researchers and back-translated by a native English speaker. The Dutch version has shown acceptable to good internal consistency and structural validity (Willemse et al., 2020). Cronbach's alpha at the 3-month measurement was .77, indicating sufficient internal consistency.

### 2.2.5. Fear of negative evaluation

The brief Fear of Negative Evaluation Scale (FNES) (Leary, 1983) was used to assess fear of negative evaluation at 3 months post-burn. It comprises 12 items that are scored on a 5-point Likert scale, ranging from 1 (not at all characteristic of me) to 5 (extremely characteristic of me). An example item is: 'I am usually worried about what kind of impression I make'. The sum score was calculated. Higher scores indicate more fear of negative evaluation. The scale has shown acceptable validity and excellent internal consistency with Cronbach's alpha  $>.90$  (Carleton et al., 2011), including the Dutch validated version (Bögels & Reith, 1999). Cronbach's alpha was .97 for the current patient sample, indicating excellent internal consistency.

### 2.3. Statistical analyses

First, data were inspected for missing values. Next, normality of the data was examined and means, standard deviations, range and inter-correlations for the total sample, and men and women separately were calculated with SPSS 27. A path model was used to examine the associations between gender, age and burn severity (indicated by the centered grand mean of TBSA burned), perceived stigmatization, fear of negative evaluation, body image dissatisfaction and self-esteem. Furthermore, we tested direct and indirect effects of gender, age and burn severity with body image dissatisfaction and self-esteem through fear of negative evaluation (FNE) and perceived stigmatization. The model was tested using Mplus 7.4 (Muthén & Muthén, 2007). As values of skewness and kurtosis indicated deviations from normality in some variables and indirect effects were included, bootstrapping ( $n=1000$ ) was used to assess the effects. Bias-corrected bootstrap confidence intervals are reported. Path estimates were considered significant in case zero was not contained in the 95% confidence interval (CI). Relationships were tested two-sided. Full information maximum likelihood (FIML) was used to deal with missing data, hereby using all available data. Goodness-of-fit of the model was evaluated with the following indices: the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Squared Residual (SRMR). A good model fit was assumed when CFI and TLI were close to .95, RMSEA was close to .06 and SRMR was close to .08 (Hu & Bentler, 1999).

## 3. Results

### 3.1. Descriptive statistics and correlations

Pearson correlations, means, and standard deviations of the variables are shown in Table 1. With the exception of TBSA burned (skewness = 3.14; kurtosis = 11.42) and FNE (skewness = 1.5; kurtosis = 1.6) the variables were approximately normally distributed (skewness range =  $-.60 - .79$ ; kurtosis range =  $-.88 - .11$ ). There was a large correlation between self-esteem and body image dissatisfaction:  $-.62$ . Men had a higher mean TBSA burned compared to women ( $M=11.43$  ( $SD=13.08$ ) versus  $M=7.33$  ( $SD=5.64$ ),  $t(222) = 2.45$ ,  $p = .015$ )

**Table 1.** Pearson Correlations between the study variables and Means (M), Standard Deviations (SD) and Range for the total sample and separately for males and females.

	1.	2.	3.	4.	5.	6.
1. Age	–					
2. TBSA burned	-.01	–				
3. Perceived stigmatization	-.20**	.25**	–			
4. FNE	-.26**	-.08	.35**	–		
5. Body image dissatisfaction	-.14*	.25**	.38**	.44**	–	
6. Self-esteem	.06	-.14	-.35**	-.49**	-.62**	–
n total	224	224	202	215	195	201
Mean total	44.69	10.23	35.91	8.27	20.44	22.87
SD total	15.68	11.54	7.68	10.91	17.81	6.14
Range total	18-82	1-75	21-60	0-46	0-73	6-30
n (male/female)	158 66	158 66	147 55	155 60	137 58	140 61
Mean (male/female)	45.92 41.76	11.44 7.33	35.77 36.27	5.88 14.47	17.68 26.95	23.96 20.36
SD (male/female)	15.95 17.07	13.08 5.64	7.40 8.45	8.40 13.92	17.17 17.74	5.70 6.47
Range (male/female)	18-82 18-82	1-75 2-30	21-57 21-60	0-38 0-46	0-71 0-73	6-30 6-30

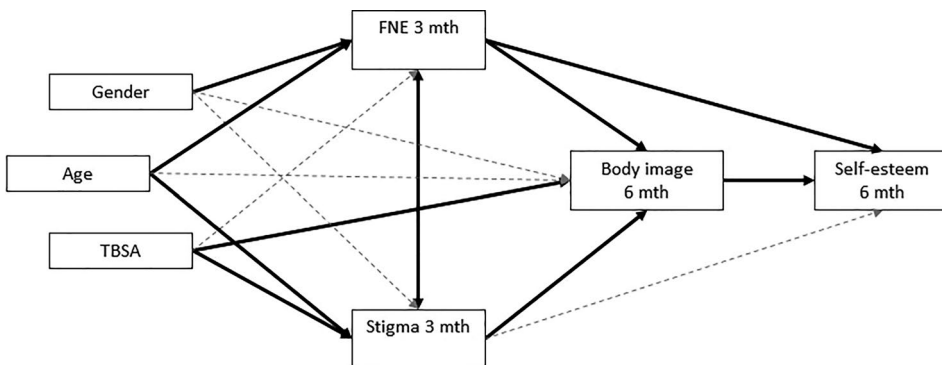
Note. TBSA=Total Body Surface Area; FNE=Fear of negative evaluation.

\**p* <.05 (2-tailed).

\*\**p* <.01 (2-tailed).

### 3.2. Path analysis

Figure 1 presents the model that was tested. Fit indices showed a good model fit: CFI = 0.990, TLI = 0.941, RMSEA = 0.062, SRMR = 0.019,  $\chi^2(3) = 5.607, p = .13$ . Table 2 shows the results of the path analysis. Model results indicated that higher TBSA burned was related to perceived stigmatization ( $\beta = .26, 95\%CI: [.13, .39]$ ) and body image dissatisfaction ( $\beta = .25, 95\%CI: [.07, .42]$ ), but not to FNE ( $\beta = -.03, 95\%CI: [-.11, .06]$ ). Furthermore, female gender was related to FNE ( $\beta = .33, 95\%CI: [.19, .45]$ ), but not to perceived stigmatization ( $\beta = .05, 95\%CI: [-.08, .19]$ ) and body image dissatisfaction ( $\beta = .12, 95\%CI: [-.03, .26]$ ). FNE was related to self-esteem ( $\beta = -.26, 95\%CI: [-.37, -.15]$ ), but perceived stigmatization was not ( $\beta = -.09, 95\%CI: [-.23, .04]$ ). Age was related to stigmatization ( $\beta = -.19, 95\%CI: [-.31, -.05]$ ) and FNE ( $\beta = -.22, 95\%CI: [-.34, -.10]$ ). Additionally, a negative relationship was found between body image dissatisfaction and self-esteem ( $\beta = -.46, 95\%CI: [-.60, -.33]$ ). Cross-sectional



**Figure 1.** Estimated model (*n*=224). Solid lines indicate significant effects. Dashed lines indicate non-significant effects. TBSA=Total Body Surface Area; FNE=Fear of negative evaluation.



path coefficients indicated a positive relationship between FNE and perceived stigmatization ( $\beta = .36$ , 95%CI: [.24, .49]). The model explained 11% of the variance in perceived stigmatization, 18% in FNE, 30% in body image dissatisfaction and 45% in self-esteem.

Potential indirect effects of perceived stigmatization and FNE on body image dissatisfaction were examined. Both the direct path from TBSA burned to body image dissatisfaction ( $\beta = .25$ , 95%CI: [.07, .42]) and the indirect path through perceived stigmatization were significant ( $\beta = .05$ , 95%CI: [.006, .11]). Regarding gender, the indirect path to body image dissatisfaction through FNE was statistically significant ( $\beta = .12$ , 95%CI: [.05, .20]). Regarding age, the indirect paths to body image dissatisfaction through FNE ( $\beta = -.08$ , 95%CI: [-.14, -.03]) and perceived stigmatization ( $\beta = -.03$ , 95%CI: [-.08, -.003]) were statistically significant.

The indirect path from perceived stigmatization to self-esteem through body image dissatisfaction ( $\beta = -.08$ , 95%CI: [-.16, -.02]) was significant, indicating that perceived stigmatization was indirectly related to self-esteem. Both the direct effect of FNE on self-esteem and the indirect effect of FNE on self-esteem through body image dissatisfaction ( $\beta = -.16$ , 95%CI: [-.25, -.09]) were significant, indicating that FNE was directly and indirectly related to self-esteem.

#### 4. Discussion

The current study examined the role of burn severity, age and gender in connection with body image dissatisfaction and self-esteem in patients with burns and the possible role of perceived stigmatization and fear of negative evaluation herein. Three main findings can be summarized. First, in line with our hypothesis, burn severity was associated with body image dissatisfaction both directly and indirectly through perceived stigmatization. In turn, perceived stigmatization was associated with self-esteem indirectly through body image dissatisfaction, which partly confirm the hypothesis on self-esteem. Second, as hypothesized, female gender was related to more body image dissatisfaction through fear of negative evaluation. Fear of negative evaluation was both directly associated with self-esteem and indirectly through body image dissatisfaction. Third, younger age was indirectly related to body image dissatisfaction and self-esteem, both through perceived stigmatization and fear of negative evaluation.

The finding that burn severity was associated with later assessments of body image dissatisfaction directly and indirectly through perceived stigmatization replicates previous studies (Lawrence et al., 2004; 2012; Thombs et al., 2008), and supports interpersonal influences on body image as proposed in Cash's cognitive behavioral model (Cash, 2011; Leary & Baumeister, 2000a). Taking into account the relationship with body image dissatisfaction, perceived stigmatization was associated with self-esteem only through body image dissatisfaction, whereas the direct relationship with self-esteem as proposed in Sociometer theory (Leary & Baumeister, 2000b) could not be established. This suggests there is no unique effect of burn severity on self-esteem beyond its influence on body image dissatisfaction after burn injury. Gender was not significantly associated with perceived stigmatization, which supports previous studies

**Table 2.** Direct and indirect effects of the relationships between TBSA, gender, perceived stigmatization, FNE, self-esteem, and body image dissatisfaction.

Model results: direct effects	B	SE	95% CI	$\beta$
<b>Perceived stigmatization</b>				
TBSA	0.17	0.05	<b>0.09, 0.29</b>	.26
Gender	0.89	1.20	-1.37, 3.28	.05
Age	-0.09	0.03	<b>-0.16, -0.03</b>	-.19
<b>FNE</b>				
TBSA	-0.03	0.04	-0.11, 0.06	-.03
Gender	7.87	1.80	<b>4.35, 11.30</b>	.33
Age	-0.16	0.05	<b>-0.25, -0.07</b>	-.22
<b>Body image dissatisfaction</b>				
TBSA	0.37	0.14	<b>0.11, 0.66</b>	.25
Gender	4.43	2.74	-1.05, 9.64	.12
Age	0.01	0.07	-0.14, 0.14	.01
Perceived stigmatization	0.41	0.17	<b>0.07, 0.75</b>	.18
FNE	0.56	0.12	<b>0.33, 0.80</b>	.35
<b>Self-esteem</b>				
Perceived stigmatization	-0.07	0.06	-0.19, 0.04	-.09
FNE	-0.15	0.03	<b>-0.21, -0.08</b>	-.26
Body image dissatisfaction	-0.16	0.03	<b>-0.21, -0.11</b>	-.46
Perceived stigmatization with FNE	26.12	5.32	<b>15.56, 36.61</b>	.36
<b>Indirect effects</b>				
<b>TBSA to Body image dissatisfaction</b>				
Perceived stigmatization	0.07	0.04	<b>0.01, 0.18</b>	.05
FNE	-0.02	0.02	-0.07, 0.04	-.01
<b>Gender to Body image dissatisfaction</b>				
Perceived stigmatization	0.36	0.57	-0.62, 1.75	.01
FNE	4.44	1.42	<b>2.03, 7.52</b>	.12
<b>Age to Body image dissatisfaction</b>				
Perceived stigmatization	-0.04	0.02	<b>-0.09, -0.003</b>	-.03
FNE	-0.09	0.03	<b>-0.16, -0.03</b>	-.08
<b>Stigma to Self-esteem</b>				
Body image dissatisfaction	-0.07	0.03	<b>-0.14,-0.01</b>	-.08
<b>FNE to Self-esteem</b>				
Body image dissatisfaction	-0.09	0.03	<b>-0.15,-0.05</b>	-.16

Note. CI=Bootstrap bias corrected two-sided 95% confidence interval. Statistically significant Confidence Intervals (CI) effects are presented bold; TBSA=total body surface area burned; FNE=fear of negative evaluation. Gender: male = 0, female = 1.

showing that stigmatizing behavior related to visible differences is present in both men and women (Crerand et al., 2020).

The finding that female gender was associated with body image dissatisfaction and self-esteem through fear of negative evaluation extends the literature on possible reasons why women show worse adjustment after burns compared to men (Wasiak et al., 2017). Our results are in concert with previous studies reporting higher levels of dissatisfaction with appearance in women with burns compared to men (Al Ghriwati et al., 2017) and, more generally, that women show a greater tendency towards negative social evaluations (Duke et al., 2006). Placing more importance on appearance may feed fear of negative evaluation and make women more vulnerable to body image dissatisfaction and low self-esteem. Beyond the relationship with gender, this study adds that fear of negative evaluation may be related to the evaluation of one's body and the global self. Both effects may be explained by a pre-existing sensitivity to social rejection in general. Still, we cannot exclude an additional effect of the burns, given the positive correlation between fear of negative evaluation and perceived stigmatization, which in turn was linked to burn severity.

This study indicates that burn severity and gender, factors that have been found pivotal in prior research (Al Ghriwati et al., 2017; Thombs et al., 2008), are associated with body image dissatisfaction through different pathways. This study adds that different underlying psychological and social constructs may play a role. Fear of negative evaluation may reflect a pre-existing psychological vulnerability affecting body image and self-esteem, whereas perceived stigmatization may indicate a burn-specific effect, as burn severity showed to be uniquely related to body image through stigmatization. It suggests that treatment of fear of negative evaluation may potentially improve psychological outcomes in this populations

Research about the relationship between younger age in burn populations and body image dissatisfaction is scant. Our results suggest that stigmatizing behavior may be more disturbing to younger people's self-evaluation, compared to older adults. Younger age was also related to fear of negative evaluation. Although the connection between social relationships and self-evaluation was found across all ages (Barnett et al., 2020; Orth et al., 2018), this study suggests that self-evaluation in younger adults may be affected particularly through (fear of) social rejection when appearance is involved.

This study points to potential implications for clinical burn practice. It suggests that self-esteem building interventions may be valuable. Cognitive Behavioral Therapy (CBT) techniques (David et al., 2018), and social interaction skills training, such as FaceIT (van Dalen et al., 2021) directed at appearance-related distress including stigmatizing reactions may help burn survivors to deal with (fear of) negative evaluations of others. Acceptance and Commitment Therapy (ACT) is proposed as alternative interventions aimed at strengthening psychological flexibility including acceptance and discovering and pursuing one's values (Lewis-Smith et al., 2019; Shepherd et al., 2019). In addition, burn survivors may benefit from cognitive self-esteem building interventions, for instance Competitive Memory Training (COMET). This intervention focuses on the inhibition of negative self-beliefs by enhancing accessibility of positive self-beliefs. COMET has shown promising results in several populations (Korrelboom et al., 2012) including patients with anxiety disorders (Staring et al., 2016). Future research may elucidate whether patients benefit from psychological interventions directed at dealing with social reactions and the person's own appraisals towards the changed appearance as well as enhancing self-esteem. Furthermore, research may investigate whether body image dissatisfaction and self-esteem play a role in the maintenance of depression and posttraumatic stress symptoms after burns and whether social support increases body image and self-esteem.

Strengths of the current study include the relatively large sample size, the use of path analysis, and it is one of few studies that investigated both body image and self-esteem in one model in this patient group. Still, several limitations should be mentioned. First, burn severity was relatively low in this study, i.e., less than 10% of the participants had burns covering more than 20% of the body, men were overrepresented and they had on average more severe burns. These sample characteristics and the small sample size for women ( $n=66$ ) hampered more complex analyses such as moderated mediation or a multi-group analysis that might have revealed specific gender differences. Second, our assessment of fear of negative evaluation stemmed from social anxiety literature. A more burn-specific measure of appearance anxiety may be more sensitive to tap social fears

in this population and could be developed in the future. Third, no pre-burn or baseline measures of body image dissatisfaction and self-esteem were available to understand to what extent burn may impact these constructs. As indicated by a qualitative study, when burn survivors' pre-burn body image was highly related to physical attractiveness they had more trouble accepting the changed appearance post-burn (Hodder et al., 2014). Furthermore, the period of measurement was relatively short. Along with scar maturation changes over time may be expected. Finally, we used a model in which associations were adjusted for other effects, but causality could not be established.

To conclude, burn severity, gender and age were related to body image dissatisfaction through an association with perceived stigmatization and fear of negative evaluation. Fear of negative evaluation and body image dissatisfaction were associated with self-esteem. To improve self-evaluations, both burn-specific and personal factors should be taken into account.

### Acknowledgements

This study represents the collaborative efforts of the Dutch-Belgian psychosocial research group consisting of J. Meijer, A. Boekelaar, H. Hofland, L. Braem, A.S. Goemanne and E. Vandermeulen, representing the burn centers in Groningen, Beverwijk, Rotterdam, Antwerp, Gent, and Brussels.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### Funding

This work was supported by the Dutch Burns Foundation under Grant numbers 12.105 and 17.102.

### ORCID

Marthe R. Egberts  <http://orcid.org/0000-0002-4698-2367>

Nancy E. Van Loey  <http://orcid.org/0000-0001-8227-7625>

### Data availability statement

The data that support the findings of this study are available on request from the corresponding author, NVL. The data are not publicly available due to the uniqueness of the data. Burns are treated in a limited number of dedicated burn centers in the Netherlands and Belgium, which may compromise the privacy of research participants.

### References

Adams, K. E., Tyler, J. M., Calogero, R., & Lee, J. (2017). Exploring the relationship between appearance-contingent self-worth and self-esteem: The roles of self-objectification and appearance anxiety. *Body Image, 23*, 176–182. <https://doi.org/10.1016/j.bodyim.2017.10.004>

- Al Ghriwati, N., Sutter, M., Pierce, B. S., Perrin, P. B., Wiechman, S. A., & Schneider, J. C. (2017). Two-year gender differences in satisfaction with appearance after burn injury and prediction of five-year depression: A latent growth curve approach. *Archives of Physical Medicine and Rehabilitation*, 98(11), 2274–2279. <https://doi.org/10.1016/j.apmr.2017.04.011>
- Bakker, A., Van der Heijden, P. G., Van Son, M. J., Van de Schoot, R., & Van Loey, N. E. (2011). Impact of pediatric burn camps on participants' self esteem and body image: an empirical study. *Burns: Journal of the International Society for Burn Injuries*, 37(8), 1317–1325. <https://doi.org/10.1016/j.burns.2011.01.009>
- Barnett, M. D., Moore, J. M., & Edzards, S. M. (2020). Body image satisfaction and loneliness among young adult and older adult age cohorts. *Archives of Gerontology and Geriatrics*, 89, 104088. <https://doi.org/10.1016/j.archger.2020.104088>
- Bögels, S. M., & Reith, W. (1999). Validity of two questionnaires to assess social fears: The Dutch social phobia and anxiety inventory and the blushing, trembling and sweating questionnaire. *Journal of Psychopathology and Behavioral Assessment*, 21(1), 51–66. <https://doi.org/10.1023/A:1022812227606>
- Carleton, R. N., Collimore, K. C., McCabe, R. E., & Antony, M. M. (2011). Addressing revisions to the Brief Fear of Negative Evaluation scale: measuring fear of negative evaluation across anxiety and mood disorders. *Journal of Anxiety Disorders*, 25(6), 822–828. <https://doi.org/10.1016/j.janxdis.2011.04.002>
- Cash, T. (2012). Cognitive-behavioral perspectives on body image. *Encyclopedia of Body Image and Human Appearance*, 1, 334–342. <https://doi.org/10.1016/B978-0-12-384925-0.00054-7>
- Cash, T. F. (2011). *Cognitive-behavioral perspectives on body image Body image: A handbook of science, practice, and prevention* (2nd ed, pp. 39–47). The Guilford Press.
- Cash, T., Santos, M., & Williams, E. (2005). Coping with body-image threats and challenges: Validation of the body image coping strategies inventory. *Journal of Psychosomatic Research*, 58(2), 190–199. <https://doi.org/10.1016/j.jpsychores.2004.07.008>
- Cleary, M., Kornhaber, R., Thapa, D. K., West, S., & Visentin, D. (2020). A quantitative systematic review assessing the impact of burn injuries on body image. *Body Image*, 33, 47–65. <https://doi.org/10.1016/j.bodyim.2020.02.008>
- Crerand, C. E., Rumsey, N., Kazak, A., Clarke, A., Rausch, J., & Sarwer, D. B. (2020). Sex differences in perceived stigmatization, body image disturbance, and satisfaction with facial appearance and speech among adolescents with craniofacial conditions. *Body Image*, 32, 190–198. <https://doi.org/10.1016/j.bodyim.2020.01.005>
- David, D., Cristea, I., & Hofmann, S. (2018). Why cognitive behavioral therapy is the current gold standard of psychotherapy. *Frontiers in Psychiatry*, 9, 4. <https://doi.org/10.3389/fpsy.2018.00004>
- Duke, D., Krishnan, M., Faith, M., & Storch, E. A. (2006). The psychometric properties of the brief fear of negative evaluation scale. *Journal of Anxiety Disorders*, 20(6), 807–817. <https://doi.org/10.1016/j.janxdis.2005.11.002>
- Franck, E., De Raedt, R., Barbez, C., & Rosseel, Y. (2008). Psychometric properties of the Dutch Rosenberg self-esteem scale. *Psychologica Belgica*, 48(1), 25–35. <https://doi.org/10.5334/pb-48-1-25>
- Freitas, N. d. O., Forero, C. G., Caltran, M. P., Alonso, J., Dantas, R. A. S., Piccolo, M. S., Farina, J. A., Lawrence, J. W., & Rossi, L. A. (2018). Validation of the perceived stigmatization questionnaire for Brazilian adult burn patients. *PLoS One*, 13(1), e0190747. <https://doi.org/10.1371/journal.pone.0190747>
- Grossbard, J. R., Lee, C. M., Neighbors, C., & Larimer, M. E. (2009). Body image concerns and contingent self-esteem in male and female college students. *Sex Roles*, 60(3-4), 198–207. <https://doi.org/10.1007/s11199-008-9535-y>
- Harris, M. A., & Orth, U. (2020). The link between self-esteem and social relationships: A meta-analysis of longitudinal studies. *Journal of Personality and Social Psychology*, 119(6), 1459–1477. <https://doi.org/10.1037/pspp0000265>
- Hodder, K., Chur-Hansen, A., & Parker, A. (2014). A thematic study of the role of social support in the body image of burn survivors. *Health Psychology Research*, 2(1), 1196. doi: 10.4081/hpr.2014.

- Hu, L-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Huang, Y. K., & Su, Y. J. (2020). Burn severity and long-term psychosocial adjustment after burn injury: The mediating role of body image dissatisfaction. *Burns*. <https://doi.org/10.1016/j.burns.2020.12.015>
- Junghans-Rutelonis, A. N., Suorsa, K. I., Tackett, A. P., Burkley, E., Chaney, J. M., & Mullins, L. L. (2015). Self-esteem, self-focused attention, and the mediating role of fear of negative evaluation in college students with and without asthma. *Journal of American College Health: J ACH*, 63(8), 554–562. <https://doi.org/10.1080/07448481.2015.1057146>
- Korrelboom, K., Maarsingh, M., & Huijbrechts, I. (2012). Competitive memory training (COMET) for treating low self-esteem in patients with depressive disorders: A randomized clinical trial. *Depression and Anxiety*, 29(2), 102–110. <https://doi.org/10.1002/da.20921>
- Lawrence, J., Fauerbach, J., Heinberg, L., & Doctor, M. (2004). Visible vs hidden scars and their relation to body esteem. *The Journal of Burn Care & Rehabilitation*, 25(1), 25–32. <https://doi.org/10.1097/01.BCR.0000105090.99736.48>
- Lawrence, J., Fauerbach, J., Heinberg, L., Doctor, M., & Thombs, B. (2006). The reliability and validity of the Perceived Stigmatization Questionnaire (PSQ) and the Social Comfort Questionnaire (SCQ) among an adult burn survivor sample. *Psychological Assessment*, 18(1), 106–111. <https://doi.org/10.1037/1040-3590.18.1.106>
- Lawrence, J., Heinberg, L., Roca, R., Munster, A., Spence, R., & Fauerbach, J. (1998). Development and validation of the satisfaction with appearance scale: Assessing body image among burn-injured patients. *Psychological Assessment*, 10(1), 64–70. <https://doi.org/10.1037/1040-3590.10.1.64>
- Lawrence, J. W., Mason, S. T., Schomer, K., & Klein, M. B. (2012). Epidemiology and impact of scarring after burn injury: a systematic review of the literature. *Journal of Burn Care & Research: Official Publication of the American Burn Association*, 33(1), 136–146. <https://doi.org/10.1097/BCR.0b013e3182374452>
- Leary, M. R. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin*, 9(3), 371–375. <https://doi.org/10.1177/0146167283093007>
- Leary, M. R. (2015). Emotional responses to interpersonal rejection. *Dialogues in Clinical Neuroscience*, 17(4), 435–441.
- Leary, M. R., & Baumeister, R. F. (2000b). The nature and function of self-esteem: Sociometer theory. *Advances in Experimental Social Psychology*, 32, 1–62. [https://doi.org/10.1016/S0065-2601\(00\)80003-9](https://doi.org/10.1016/S0065-2601(00)80003-9)
- Leary, M., & Baumeister, R. (2000a). *The nature and function of self-esteem: Sociometer theory* (Vol. 32). Academic Press.
- Lewis-Smith, H., Diedrichs, P. C., & Halliwell, E. (2019). Cognitive-behavioral roots of body image therapy and prevention. *Body Image*, 31, 309–320. <https://doi.org/10.1016/j.bodyim.2019.08.009>
- Macleod, R., Shepherd, L., & Thompson, A. R. (2016). Posttraumatic stress symptomatology and appearance distress following burn injury: An interpretative phenomenological analysis. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, 35(11), 1197–1204. <https://doi.org/10.1037/hea0000391>
- Marino, M., Soley-Bori, M., Jette, A. M., Slavin, M. D., Ryan, C. M., Schneider, J. C., Acton, A., Amaya, F., Rossi, M., Soria-Saucedo, R., Resnik, L., & Kazis, L. E. (2017). Measuring the social impact of burns on survivors. *Journal of Burn Care & Research: Official Publication of the American Burn Association*, 38(1), e377–e383. <https://doi.org/10.1097/BCR.0000000000000398>
- Martin, L., Byrnes, M., McGarry, S., Rea, S., & Wood, F. (2017). Social challenges of visible scarring after severe burn: A qualitative analysis. *Burns: Journal of the International Society for Burn Injuries*, 43(1), 76–83. <https://doi.org/10.1016/j.burns.2016.07.027>
- Müller, A., Smits, D., Claes, L., Jasper, S., Berg, L., Ipaktchi, R., Vogt, P. M., & de Zwaan, M. (2016). Validation of the German version of the perceived stigmatization questionnaire/social comfort questionnaire in adult burn survivors. *Burns: Journal of the International Society for Burn Injuries*, 42(4), 790–796. <https://doi.org/10.1016/j.burns.2016.01.001>

- Muthén, L. K., & Muthén, B. O. (2007). *Mplus user's guide* (5th ed. Vol. 7). Muthén & Muthén.
- Orth, U., Erol, R. Y., & Luciano, E. C. (2018). Development of self-esteem from age 4 to 94 years: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 144(10), 1045–1080. <https://doi.org/10.1037/bul0000161>
- Rosenberg, M. (1989). *Society and the adolescent self-image*. revised edition. Wesleyan University Press.
- Ross, E., Crijns, T. J., Ring, D., & Coopwood, B. (2021). Social factors and injury characteristics associated with the development of perceived injury stigma among burn survivors. *Burns: Journal of the International Society for Burn Injuries*, 47(3), 692–697. <https://doi.org/10.1016/j.burns.2020.07.022>
- Shepherd, L., Reynolds, D. P., Turner, A., O'Boyle, C. P., & Thompson, A. R. (2019). The role of psychological flexibility in appearance anxiety in people who have experienced a visible burn injury. *Burns*, 45(4), 942–949. <https://doi.org/10.1016/j.burns.2018.11.015>
- Sinha, I., Nabi, M., Simko, L. C., Wolfe, A. W., Wiechman, S., Giatsidis, G., Bharadia, D., McMullen, K., Gibran, N. S., Kowalske, K., Meyer, W. J., Kazis, L. E., Ryan, C. M., & Schneider, J. C. (2019). Head and neck burns are associated with long-term patient-reported dissatisfaction with appearance: A Burn Model System National Database study. *Burns*, 45(2), 293–302. <https://doi.org/10.1016/j.burns.2018.12.017>
- Sowislo, J. F., & Orth, U. (2013). Does low self-esteem predict depression and anxiety? A meta-analysis of longitudinal studies. *Psychological Bulletin*, 139(1), 213–240. <https://doi.org/10.1037/a0028931>
- Staring, A. B., van den Berg, D. P., Cath, D. C., Schoorl, M., Engelhard, I. M., & Korrelboom, C. W. (2016). Self-esteem treatment in anxiety: A randomized controlled crossover trial of Eye Movement Desensitization and Reprocessing (EMDR) versus Competitive Memory Training (COMET) in patients with anxiety disorders. *Behaviour Research and Therapy*, 82, 11–20. <https://doi.org/10.1016/j.brat.2016.04.002>
- Thombs, B. D., Notes, L. D., Lawrence, J. W., Magyar-Russell, G., Bresnick, M. G., & Fauerbach, J. A. (2008). From survival to socialization: a longitudinal study of body image in survivors of severe burn injury. *Journal of Psychosomatic Research*, 64(2), 205–212. <https://doi.org/10.1016/j.jpsychores.2007.09.003>
- van Dalen, M., Pasmans, S. G. M. A., Aendekerk, M.-L., Mathijssen, I., Koudstaal, M., Timman, R., Williamson, H., Hillegers, M., Utens, E. M. W. J., & Okkerse, J. (2021). Investigating online psychological treatment for adolescents with a visible difference in the Dutch YP Face IT study: protocol of a randomised controlled trial. *British Medical Journal Open*, 11(1), e041449. <https://doi.org/10.1136/bmjopen-2020-041449>
- Wasiak, J., Lee, S., Paul, E., Shen, A., Tan, H., Cleland, H., & Gabbe, B. (2017). Female patients display poorer burn-specific quality of life 12 months after a burn injury. *Injury*, 48(1), 87–93. <https://doi.org/10.1016/j.injury.2016.07.032>
- Weeks, J. W., Jakatdar, T. A., & Heimberg, R. G. (2010). Comparing and contrasting fears of positive and negative evaluation as facets of social anxiety. *Journal of Social and Clinical Psychology*, 29(1), 68–94. <https://doi.org/10.1521/jscp.2010.29.1.68>
- Willemse, H., Geenen, R., & Van Loey, N. E. (2020). Reliability and structural validity of the Dutch version of perceived stigmatization questionnaire in adults with burns. *Burns: journal of the International Society for Burn Injuries*. <https://doi.org/10.1016/j.burns.2020.11.017>