



This is a repository copy of *The role of psychological flexibility in appearance anxiety in people who have experienced a visible burn injury*.

White Rose Research Online URL for this paper:
<http://eprints.whiterose.ac.uk/139531/>

Version: Accepted Version

Article:

Shepherd, L., Reynolds, D., Turner, A. et al. (2 more authors) (2018) The role of psychological flexibility in appearance anxiety in people who have experienced a visible burn injury. *Burns*. ISSN 0305-4179

<https://doi.org/10.1016/j.burns.2018.11.015>

Article available under the terms of the CC-BY-NC-ND licence
(<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Reuse

This article is distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs (CC BY-NC-ND) licence. This licence only allows you to download this work and share it with others as long as you credit the authors, but you can't change the article in any way or use it commercially. More information and the full terms of the licence here: <https://creativecommons.org/licenses/>

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

The role of psychological flexibility in appearance anxiety in people
who have experienced a visible burn injury

Laura Shepherd^{*a}

Darren P. Reynolds^a

Anna Turner^a

Ciaran P. O'Boyle^{b,c}

Andrew R. Thompson^d

^a Department of Clinical Psychology & Neuropsychology, Queens Medical Centre Campus,
Derby Road, Nottingham, NG7 2UH, United Kingdom

^b ^aBurns and Plastic Surgery Department, Nottingham University Hospitals NHS Trust, City
Hospital Campus, Nottingham, NG5 1PB, United Kingdom

^cSchool of Medicine, The University of Nottingham, University Park, Nottingham, UK

^dDepartment of Psychology, University of Sheffield, Cathedral Court, 1 Vicar Lane, Floor F,
Sheffield, S1 2LT, United Kingdom

*Corresponding author:

Dr Laura Shepherd, Consultant Clinical Psychologist, Nottingham University Hospitals NHS
Trust, Department of Clinical Psychology & Neuropsychology, Queens Medical Centre
Campus, Derby Road, Nottingham, NG7 2UH, United Kingdom, Tel: +44 115 924 9924,
Email: Laura.Shepherd@nuh.nhs.uk

Abstract

Background: Individuals with visible differences can experience appearance anxiety that is distressing and disruptive to daily functioning. Understanding psychological factors that maintain appearance anxiety related to scarring is important in developing theoretical understanding of adjustment to injury, and in identifying targets for psychological therapies. This study aimed to investigate whether psychological flexibility, a key element underpinning acceptance and commitment therapy (ACT), was associated with appearance anxiety. It was hypothesised that reduced psychological flexibility (lower acceptance, cognitive defusion, mindfulness, and committed action) would be related to increased appearance anxiety. The role of psychological flexibility in the maintenance of appearance anxiety was investigated using a cross-sectional quantitative questionnaire study. Method: Seventy-eight burns patients (47 female, 31 male; M age = 45.2 years) completed the Derriford Appearance Scale (DAS-24), the Acceptance and Action Questionnaire (AAQ-II), the Cognitive Fusion Questionnaire (CFQ), the Five Facet Mindfulness Questionnaire (FFMQ), and the Committed Action Questionnaire (CAQ-8). Results: As hypothesised, increased appearance anxiety was related to reduced acceptance ($r_s(76)=0.80, p<0.001$, one-tailed) and cognitive defusion ($r_s(76)=0.76, p<0.001$). Reduced levels of mindfully describing ($r(72)=-0.39, p<0.001$), acting with awareness ($r(72)=-0.57, p<0.001$), non-judging ($r(72)=-0.61, p<0.001$) and non-reactivity ($r(72)=-0.28, p<0.01$) as well as reduced committed action ($r(72)=-0.57, p<0.001$) were also related to increased appearance anxiety. Conclusions: Individuals experiencing appearance anxiety associated with a burn injury may struggle with accepting difficult emotions, stepping back from distressing thoughts, being mindful and engaging in valued action. These findings suggest that ACT may be useful in treating appearance related anxiety and concerns associated with conditions causing a visible difference.

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

Keywords: burn; appearance; disfigurement; visible difference; psychological flexibility; acceptance and commitment therapy; ACT

Introduction

Individuals with a visible difference are known to experience higher levels of psychological distress compared to the general population with difficulties including anxiety, post-traumatic stress disorder, depression and low self-esteem [1-3]. This is unsurprising given the stigma and negative social responses (e.g. stares, name calling and unsolicited questions) that can be associated with looking visibly different [4-7]. Difficulties adjusting to an altered appearance can lead to anxiety, shame, reduced self-worth, social avoidance and isolation which can significantly interfere with social, occupational and relational functioning, lowering quality of life for some individuals [8-12]. However, some individuals adjust well [13-15]. Of significance, the objective severity of the visible difference is not a good predictor of psychological distress [7,16-20]. Therefore, it is important to identify the psychological factors that maintain distress associated with appearance in those living with a visible difference that has been referred to by many working in this field as ‘appearance anxiety’ [21]. Understanding psychological factors that play such a role will enhance not only our theoretical knowledge base but will also inform the development of targeted psychological therapies.

Published data highlights the importance of cognitive and behavioural factors in the maintenance of appearance anxiety, such as beliefs related to the value and acceptability of appearance, social comparisons, information-processing biases, self-focused attention and avoidance behaviour [21-25]. These factors may negatively affect social skills and social interactions, thus maintaining the problem [26]. This has led to cognitive-behavioural interventions to be utilised to treat appearance anxiety, with the aim of challenging unhelpful or excessively negative thoughts and beliefs about appearance or others’ reactions and systematically reducing unhelpful avoidance and safety-seeking behaviours. However, the availability of high-quality studies exploring effectiveness is limited [21,27-28].

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

There is increasing evidence for the effectiveness of third-wave cognitive therapies such as Acceptance and Commitment Therapy (ACT) [29] in the treatment of anxiety disorders, depression [30], difficulties adjusting to physical health problems such as chronic pain [31] and body dissatisfaction and weight self-stigma [32]. Furthermore, psychological inflexibility has been found to be involved in the perpetuation of psychological distress [33]. Psychological flexibility is considered to be the mechanism of change underlying ACT [34] and includes a combination of six facets: present moment focus/mindfulness; willingness to feel distressing internal experiences such as emotions (acceptance); an ability to stand back from and observe thoughts (cognitive defusion); an awareness of the self as being an observer to one's internal experiences (self-as-context); an ability to know what matters (values); and being able to behave in line with these values (committed action). Identifying and enhancing characteristics of psychological flexibility may be particularly relevant for individuals struggling with appearance anxiety in order to improve their ability to manage their distressing internal experiences more effectively so that they can focus on what is important to them thus engaging in a rich and meaningful life.

No research to date has explored the use of ACT for appearance anxiety, although this has been recommended [32]. Furthermore, there is minimal research that has explored the possible role of psychological flexibility in appearance anxiety. Two studies that explored single facets of psychological flexibility were found. One study explored the role of mindfulness in distress associated with visible skin conditions. It reported increased mindfulness significantly predicted social anxiety and skin shame. One particular facet of mindfulness, acting with awareness, was reported to be the most consistent predictor of distress [35]. A second study explored the role of acceptance in quality of life in those living with lipodema. Higher levels of acceptance were reported to predict increased quality of life [36].

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

The aim of the current study was to explore the role of psychological flexibility in the maintenance of appearance anxiety utilising an adult burns population. People who survive burn injuries are known to experience appearance anxiety. This is due to the unexpected and sudden change in appearance due to scarring from such injuries, as well as other psychological difficulties such as those aforementioned [23,37-38]. There is currently minimal published literature investigating the role of psychological flexibility in appearance anxiety in those that have experienced injuries resulting in scarring. This study is therefore important in bridging this gap, enhancing our knowledge about the psychological factors that maintain appearance anxiety and identifying potential treatment targets for psychological interventions to improve quality of life in individuals living with a visible difference. It was hypothesised that reduced psychological flexibility (lower acceptance, cognitive defusion, mindfulness, and committed action) would be related to increased appearance anxiety.

Method

Design

Data was collected between March and May 2018. The study design was a cross sectional quantitative questionnaire study. The study gained ethical approval from the Health Research Authority in the UK (Ref: 18/YH/0079) and informed consent was gained from all participants prior to their participation.

Participants

Seventy eight (n = 47 female) individuals with visible differences due to a burn injury participated in the study. Individuals were eligible to participate if they were aged 18 years and over and had experienced a burn injury that resulted in permanent scarring or other visible difference. Individuals who had only sustained superficial injuries were excluded.

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

Patients known to have cognitive impairment or limited English language were excluded on the basis that they would struggle to complete the questionnaires in a valid manner. Participants were also excluded if they sustained their injuries due to self-harm/suicide attempts. This was because the study aimed to investigate psychological flexibility in appearance anxiety following accidental burn injuries.

Measures

Six questionnaires were used to address the aims of the study. These are detailed below.

Demographic and Injury Questionnaire (unpublished): This questionnaire, designed by the research team, gathered demographic and injury-related information from participants including age, gender, ethnicity, length of time since the burn injury in months, cause of the burn injury, and the location of burns on the body.

Derriford Appearance Scale (DAS-24) [39]: This is the short form of the Derriford Appearance Scale (DAS59) which was originally designed and developed by Harris and Carr [40]. The DAS24 has good internal consistency ($\alpha = 0.92$) and test-retest reliability ($\alpha=0.82$). This 24-item self-report questionnaire measures psychological distress and the effects on daily life associated with self-consciousness of appearance. Some items in the scale require emotional responses (e.g. 'How rejected do you feel') using response categories from 'not at all' to 'extremely' whereas others ask about behaviours indicative of self-consciousness (e.g. 'I avoid communal changing rooms'), using a 'never/almost never' to 'almost always' set of responses. Some items allow for a 'not applicable' response. All participants in the present study completed the DAS-24 to measure their level of appearance anxiety following their burn injury. Each participant's score was scored and using the

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

manual, which indicates that the minimum score is 10 and the maximum score is 96, where higher scores suggest increased appearance anxiety [41]. Reference data for both clinical and non-clinical populations are reported [39].

Acceptance and Action Questionnaire II (AAQ-II) [41]: This is a revised seven item measure of psychological inflexibility and experiential avoidance. The measure has satisfactory structure, reliability and validity across six samples consisting of a total of 2,816 participants. The mean alpha coefficient is 0.84 ($\alpha = 0.78 - 0.88$), and the 3 and 12 month test-retest reliability is .81 and .79, respectively. The AAQ-II appears to measure the same concept as the Acceptance and Action Questionnaire (AAQ) [43] ($r = .97$) but is reported as having better psychometric consistency. Results indicate that AAQ-II scores can predict multiple outcomes concurrently, longitudinally, and incrementally, from mental health to work absence rates which is consistent with the underlying theory of the measure. The measure asks responders to rate statements (e.g. 'I worry about not being able to control my worries and feelings') on a seven point Likert scale from 'never true' to 'always true'. In the current study, the AAQ-II was used to measure participants' acceptance of their emotional experience. Each participant's AAQ-II score was calculated by summing the scores of the individual items where the minimum total score is 7 and the maximum total score is 49, where lower scores indicate more acceptance.

Cognitive Fusion Questionnaire (CFQ) [44]: This is a brief seven item self-report measure of cognitive fusion. The CFQ has high validity and is psychometrically sound. The CFQ has good test-retest reliability and excellent internal consistency. The CFQ is positively correlated with frequency of depressive thoughts, depressed mood, burnout, rumination, use

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

of thought control strategies and negatively associated with valued living, life satisfaction, mindfulness and psychological flexibility [44-45]. The measure asks responders to rate statements (e.g. 'I struggle with my thoughts') on a 7-point Likert scale from 'never true' to 'always true'. In the current study, the CFQ was used to measure participants' cognitive fusion. Each participant's CFQ score was calculated by summing the scores of the individual items where the minimum total score is 7 and the maximum total score is 49, with increased scores indicating poorer cognitive defusion.

Committed Action Questionnaire (CAQ-8) [46]: This is a brief eight item self-report measure of valued action, which was designed and developed following the validation of the original 18 item Committed Action Questionnaire (CAQ) [47]. The CAQ-8 comprises of two subscales with four items being positively scored and four items being negatively scored. The measure asks responders to rate positively scored statements (e.g. 'I prefer to change how I approach a goal rather than quit') and negatively scored statements (e.g. 'If I cannot do something my way, I will not do it at all') on a 7-point Likert scale from 'never true' to 'always true'. In the current study, the CAQ-8 was used to measure participants' valued action. Each participant's CAQ-8 score was calculated by summing the scores of the individual items where the minimum total score is 0 and the maximum total score is 48, with lower scores suggesting less committed action. Internal consistency of the CAQ-8 has been demonstrated to range from .70 to .87 [46,48-49] and good construct validity of the CAQ-8 is demonstrated by strong and positive correlations with the original 18 item CAQ [45].

Five Facet Mindfulness Questionnaire (FFMQ) [50]: This is a 39 item measure of mindfulness which consists of five subscales labeled as 'Observing', 'Describing', 'Acting

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

with awareness', 'Nonjudgement of inner experience', and 'Nonreactivity to inner experience'. As summarised in Baer, Smith [51], the 'Observing' facet relates to "noticing or attending to internal and external experiences, such as sensations, cognitions, emotions, sights, sounds, and smells" (e.g. 'I notice the smells and aromas of things'). The 'Describing' facet relates to "to labeling internal experiences with words" (e.g. 'I am good at finding words to describe my feelings'). The 'Acting with awareness' facet relates to "attending to one's activities of the moment and can be contrasted with behaving mechanically while attention is focused elsewhere (often called automatic pilot)" (e.g. 'I find myself doing things without paying attention'). The 'Nonjudgment of inner experience' facet relates to "taking a non-evaluative stance toward thoughts and feelings" (e.g. 'I think some of my emotions are bad or inappropriate and I should not feel them'). The 'Nonreactivity to inner experience' facet addresses "the tendency to allow thoughts and feelings to come and go, without getting caught up in or carried away by them" (e.g. 'I perceive my feelings and emotions without having to react to them'). Adequate to good internal consistency has been demonstrated for the five facet scales, with alpha coefficients ranging from .75 to .91 [50]. All 39 items of the FFMQ are rated on a 5-point Likert scale from 'Never or very rarely true' to 'Very often or always true'. In the present study participant's scores for each of the five facets were calculated by summing the scores of items corresponding to each of the facets, with the minimum total score for each facet being 0 and the maximum total score for each facet being 40 (except for the 'Nonreactivity to inner experience' facet which has a maximum total score of 35). Higher scores on the FFMQ suggest increased mindfulness.

Procedure

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

The most recent 200 patients discharged from a regional burns service, who met the inclusion criteria, were sent the study information sheet, consent form and the questionnaires by post with a pre-paid stamped addressed envelope for return. In addition to this, to make the study as accessible as possible, an online version of the questionnaires was also hosted on SurveyMonkey for a period of three months between March and May 2018. This allowed an alternative way for participants to complete the survey based on their preference. Simultaneously, the research study was advertised by two UK burns charities on their websites and social media platforms to invite interested participants to complete the study either online via SurveyMonkey or to contact the research team for a paper pack to be sent by post. Participants were instructed to return their postal questionnaires within four weeks of receiving them. Some participants were also recruited via outpatient clinics during routine appointments.

Data analysis

All quantitative data was analysed in SPSS using descriptive statistics. Correlation analyses were used to analyse the relationship between appearance anxiety and the psychological flexibility variables (acceptance, cognitive defusion, mindfulness, and committed action). Pearson's correlations were used when the data was normally distributed and Spearman's correlations were performed when the data violated this assumption. In order to examine differences within the sample, independent t-tests and ANOVA analyses were used for variables that were normally distributed and Kruskal-Wallis ANOVA and Mann-Whitney U tests were used for variables violating this assumption.

Results

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

The age range of participants was 18 – 89 years old ($M=45.20$, $SD=18.79$). The majority of participants described their ethnicity as White or Caucasian ($n=73$; 93.6%), followed by mixed background ($n=2$; 2.6%) and other, including Chinese ($n=1$; 1.3%). The ethnicity of two participants was not stated. Time (in months) since participants' burn injuries were acquired ranged from 0 months to 876 months or 73 years ($M = 110$ months, $SD=186.17$). Cause of participant's burn injuries included flame/fire/flash ($n=36$; 46.2%), scald ($n=17$; 21.8%), contact with hot object ($n=9$; 11.5%), chemical burn ($n=8$; 10.3%), explosion ($n=3$; 3.8%), friction burn ($n=2$; 2.6%) and other causes ($n=1$; 1.3%). The cause of burn injury for two participants was not stated. Areas of the body which had been burnt included head, face or neck ($n= 24$; 30.8%), arms or hands ($n=49$; 62.8%), legs or feet ($n=43$; 55.1%), stomach or chest ($n=31$; 39.7%), back ($n=14$; 17.9%), and buttocks or genitals ($n=9$; 11.5%).

[Table 1 here]

The mean score on the Derriford Appearance Scale (DAS-24) [39] was 40 and ranged from 11 to 84, suggesting a broad spread on the spectrum of appearance anxiety across the sample. Increased appearance anxiety was related to lower age ($r=-0.38$, $p=0.001$, two-tailed), increased time since the burn injury ($r=0.26$, $p<0.05$, two-tailed) and was higher in females compared to males ($F=5.11$, $p<0.05$). There was a difference in appearance anxiety between the location(s) of burns on the body ($F=2.99$, $p<0.05$, two-tailed). Those with multiple areas burnt on the body had increased appearance anxiety compared to single-site injuries ($F=11.21$, $p<0.05$, two-tailed). There was no statistically significant difference in appearance anxiety between patients who had facial burns compared to those who did not ($F=0.24$, $p>0.05$, two-tailed). However, those with facial burns had increased levels of

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

mindful observing ($F=6.74$, $p<0.05$, two-tailed). No other statistically significant differences were found between the location(s) of burns on the body and the psychological variables studied. No statistically significant differences were found between the mechanism of injury and the psychological variables studied.

Variables were examined for normal distributions and correlational analyses were conducted. Controlling for age and time since burn injury, Table 1 displays the relationship between appearance anxiety and the facets of psychological flexibility; acceptance, cognitive defusion, mindfulness and committed action.

[Table 2 here]

Results suggest that, as hypothesised, increased appearance anxiety was related to reduced acceptance ($r_s(76)=0.80$, $p<0.001$, one-tailed) and cognitive defusion ($r_s(76)=0.76$, $p<0.001$, one-tailed). Reduced levels of mindfully describing ($r(72)=-0.39$, $p<0.001$, one-tailed), acting with awareness ($r(72)=-0.57$, $p<0.001$, one-tailed), non-judging ($r(72)=-0.61$, $p<0.001$, one-tailed) and non-reactivity ($r(72)=-0.28$, $p<0.01$, one-tailed) as well as reduced committed action ($r(72)=-0.57$, $p<0.001$, one-tailed) were also related to increased appearance anxiety.

This suggests that a higher level of appearance anxiety was related to an increased difficulty in accepting or being willing to feel emotions associated with appearance and greater difficulty defusing or standing back from their negative thoughts about appearance. Furthermore, levels of mindfulness were important: reduced present-moment focus, acting with conscious awareness and a lower ability to experience internal experiences in a non-judgmental manner and without reacting to them were related to increased appearance

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

anxiety. Furthermore, those with increased levels of appearance anxiety reported a decreased ability to engage in behaviours that matter to them, in accordance with their values. Interestingly, in contrast to what was expected, increased appearance anxiety was related to a higher level of mindfully observing ($r(72)=0.27$, $p<0.01$, one tailed), the tendency to mindfully notice internal and external sensations as they arise.

Discussion

The current study aimed to explore the role of psychological flexibility in appearance anxiety, in a sample of burn-injured individuals. The main findings indicated that increased appearance anxiety was related to reduced acceptance, cognitive defusion, mindfulness and committed action, as hypothesised. That is, higher appearance anxiety was associated with less acceptance of distressing emotions about and reduced ability to defuse from negative thoughts about appearance, less present-moment focus and less engagement in meaningful and valued activities. This is the first study that has fully explored the role of psychological flexibility in the maintenance of appearance anxiety in a population with a visible difference. The findings from the current study support the wealth of research literature suggesting that psychological inflexibility is related to psychological distress [33]. This provides exciting preliminary evidence about the importance of psychological flexibility in the maintenance of appearance anxiety in those with a visible difference and the findings are consistent with recently published studies which have studied single facets of psychological flexibility such as mindfulness [35] and acceptance [36]. Indeed, a recent qualitative study exploring difficulties in adjusting to appearance changes following burn injuries, found appearance concern and PTSD symptomatology might be 'intertwined', which possibly suggests that reduced psychological flexibility might form a common mechanism by which distress is

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

maintained in both PTSD and appearance related distress in people who have experienced burn injuries [52]. Further qualitative and quantitative research is now required to investigate these relationships. A prospective study exploring the role of psychological flexibility in the development of appearance anxiety would be particularly useful.

The current study provides tentative theoretical support for the use of ACT interventions to treat appearance anxiety and future research evaluating the effectiveness of this, which has been previously recommended [53]. Within the wider visible differences literature, as previously discussed, the availability of high-quality studies exploring the effectiveness of psychosocial interventions is limited, largely focused on cognitive behaviour therapy, and further research is required [21,27]. Self-help interventions within the wider visible differences literature are also largely dominated by cognitive behaviour therapy and although a small number of studies have explored the use of third-wave approaches, such as mindfulness and compassion, there has been a call for further research and intervention development [54]. Third-wave psychological therapies are considered to be cost-effective [55] and it has been argued that ACT is suited both for prevention science and in medical settings as it can be delivered briefly [56-57]. Brief interventions and preventative (or early) interventions have so far been neglected from the appearance anxiety literature, and both would likely improve psychological burn care. ACT may be an approach that is suited to both of these. Results also suggested that patients who had multiple areas of the body burnt compared to single-site injuries had increased appearance anxiety. Furthermore, that time since the burn injury was positively correlated with appearance anxiety. This suggests that patients with multiple burn sites may be more vulnerable and should be monitored closely for appearance anxiety. It also suggests that appearance anxiety may worsen over time, rather than improve.

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

One unexpected finding of the current study was that one facet of mindfulness, mindfully observing, was positively correlated with appearance anxiety, contrary to expectations. An increased level of mindfully observing internal and external sensations was associated with increased appearance anxiety. A number of possible reasons for this can be considered. Firstly, it may be that increased mindful observing may lead to enhanced self-focused attention which has been reported to be linked with appearance anxiety [24]) and is known to be an important factor in social anxiety [58]. Alternatively, some of the items incorporated into the mindfully observing subscale may be particularly unsuitable for the burn-injured population. For example, two items are centred around heat sources ('When I take a shower or bath, I stay alert to the sensations of water on my body' and 'I pay attention to sensations, such as the wind in my hair or sun on my face'). For burn-injured individuals, sensations caused by these stimuli may create distress and avoidance of exposure to strong sunlight is indeed recommended by medical professionals. This may explain the finding of increased mindful observing in those who had experienced facial burns. Thirdly, the validity of the observing subscale has been questioned previously [51,59-60]. Fourth, interestingly, the same results were reported by Montgomery et al. [35] who explored the role of mindfulness in a dermatology sample. In their study, the authors also found that mindful observing was associated with appearance-related distress in the opposite direction to what was expected. This may suggest that the observing subscale of the Five Facet Mindfulness Questionnaire may not be valid for use in future studies concerning appearance-related distress.

Limitations to the study include the cross-sectional design. As discussed above, prospective studies should be the next step in exploring whether psychological flexibility has an aetiological role in the development of appearance anxiety. Moreover, it is possible that the results may not be generalisable to other populations where appearance is altered. Finally,

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

it was not feasible to collect objective information about the severity of participants' burn injuries (e.g. total body surface area; TBSA). This was due to the recruitment strategy which permitted anonymous participation and therefore no access to hospital records for some participants and it was considered that the reliability of self-reported values of TBSA would be poor based on anecdotal evidence gained through clinical experience. This meant that objective severity of the burn injury was not able to be controlled for in the statistical analyses. However, objective severity has repeatedly been found to be independent of psychological distress in individuals with visible differences [18].

Conclusions

Psychological flexibility appears to be important in maintaining appearance anxiety in this sample of burn-injured individuals with visible scarring. Higher appearance anxiety was associated with reduced acceptance of distressing emotions about and less ability to defuse from negative thoughts about appearance, less present-moment focus/mindfulness and less engagement in meaningful and valued activities. This is the first study that has fully explored the importance of psychological flexibility in the maintenance of appearance anxiety. ACT interventions for appearance anxiety should be developed and evaluated in future research.

Conflict of interest

The authors have no conflicts of interest to declare.

Acknowledgements

This study was kindly funded by the Nottingham Hospitals Charity.

References

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

- [1] Dalgard FJ, Gieler U, Tomas-Aragones L, Lien L, Poot F, Jemec GBE, et al. The psychological burden of skin diseases: a cross-sectional multicenter study among dermatological out-patients in 13 European countries. *J Invest Dermatol.* 2015;135:984-91.
- [2] Lansdown R, Rumsey N, Bradbury E. *Visibly different: Coping with disfigurement.* Oxford: Butterworth-Heinemann; 1997.
- [3] Wiechman SA, Patterson DR. Psychosocial aspects of burn injuries. *BMJ.* 2004;329:391-3.
- [4] Bull R, Rumsey N. *The Social Psychology of Facial Appearance.* London: Springer-Verlag; 1988.
- [5] Kleve L, Robinson E. A survey of psychological need amongst adult burn-injured patients. *Burns.* 1999;25:575-9.
- [6] Rumsey N, Bull R, Gahagan D. The Effect of Facial Disfigurement on the Proxemic Behavior of the General Public. *J Appl Soc Psychol.* 1982;12:137-50.
- [7] Thompson A, Kent G. Adjusting to disfigurement: processes involved in dealing with being visibly different. *Clin Psychol Rev.* 2001;21:663-82.
- [8] Jenkins H, Fennell M. *Building Self-Esteem: Oxford Cognitive Therapy Centre* 2004.
- [9] Rumsey N, Clarke A, White P, Wyn-Williams M, Garlick W. Altered body image: appearance-related concerns of people with visible disfigurement. *J Adv Nurs.* 2004;48:443-53.
- [10] Rumsey N, Harcourt D. *The Oxford Handbook of the Psychology of Appearance.* Oxford: Oxford University Press; 2012.

- [11] Marcusson A, Paulin G, Ostrup L. Facial appearance in adults who had cleft lip and palate treated in childhood. *Scand J Plast Reconstr Surg Hand Surg.* 2002;36:16-23.
- [12] McKenna KE, Stern RS. The impact of psoriasis on the quality of life of patients from the 16-center PUVA follow-up cohort. *J Am Acad Dermatol.* 1997;36:388-94.
- [13] Altier N, Malenfant A, Forget R, Choiniere M. Long-term adjustment in burn victims: a matched-control study. *Psychol Med.* 2002;32:677-85.
- [14] Cochran A, Edelman LS, Saffle JR, Morris SE. Self-reported quality of life after electrical and thermal injury. *J Burn Care Rehabil.* 2004;25:61-6.
- [15] Moi AL, Wentzel-Larsen T, Salemark L, Wahl AK, Hanestad BR. Impaired generic health status but perception of good quality of life in survivors of burn injury. *J Trauma.* 2006;61:961-8; discussion 8-9.
- [16] Bradbury E. *Counselling people with disfigurement.* Leicester, UK: British Psychological Society; 1996.
- [17] Malt UF, Ugland OM. A long-term psychosocial follow-up study of burned adults. *Acta Psychiatr Scand Suppl.* 1989;355:94-102.
- [18] Moss TP. The relationships between objective and subjective ratings of disfigurement severity, and psychological adjustment. *Body Image.* 2005;2:151-9.
- [19] Robinson E. *Psychological research on visible difference in adults.* London, England: Butterworth-Heinemann; 1997.
- [20] Robinson E, Rumsey N, Partridge J. An evaluation of the impact of social interaction skills training for facially disfigured people. *Br J Plast Surg.* 1996;49:281-9.
- [21] Clarke A, Thompson AR, Jenkinson E, Rumsey N, Newell R. *CBT for appearance anxiety: Psychosocial interventions for anxiety due to visible difference.* UK: Wiley; 2014.

- [22] Egan K, Harcourt D, Rumsey N. A qualitative study of the experiences of people who identify themselves as having adjusted positively to a visible difference. *J Health Psychol.* 2011;16:739-49.
- [23] Kornhaber R, Wilson A, Abu-Qamar MZ, McLean L. Coming to terms with it all: adult burn survivors' 'lived experience' of acknowledgement and acceptance during rehabilitation. *Burns.* 2014;40:589-97.
- [24] Thompson AR, Clarke SA, Newell RJ, Gawkrödger DJ. Vitiligo linked to stigmatization in British South Asian women: a qualitative study of the experiences of living with vitiligo. *Br J Dermatol.* 2010;163:481-6.
- [25] Thompson AR, Kent G, Smith JA. Living with vitiligo: dealing with difference. *Br J Health Psychol.* 2002;7:213-25.
- [26] Kent G. Understanding the experiences of people with disfigurements: An integration of four models of social and psychological functioning. *Psychol Health Med.* 2000;5:117-29.
- [27] Norman A, Moss TP. Psychosocial interventions for adults with visible differences: a systematic review. *PeerJ.* 2015;3:e870.
- [28] Shah R, Hunt J, Webb T, Thompson AR. Starting to develop self-help for social anxiety associated with vitiligo: Using clinical significance to measure the potential effectiveness of enhanced psychological self-help. *Br J of Dermatol.* 2014;171:332-337.
- [29] Hayes SC, Strosahl K, Wilson KG. *Acceptance and Commitment Therapy: An experiential approach to behavior change.* New York: Guilford Press; 1999.
- [30] Powers MB, Zum Vorde Sive Vording MB, Emmelkamp PM. Acceptance and commitment therapy: a meta-analytic review. *Psychother Psychosom.* 2009;78:73-80.

- [31] Veehof MM, Trompetter HR, Bohlmeijer ET, Schreurs KM. Acceptance- and mindfulness-based interventions for the treatment of chronic pain: a meta-analytic review. *Cogn Behav Ther.* 2016;45:5-31.
- [32] Griffiths C, Williamson H, Zucchelli F, Paraskeva N, Moss T. A Systematic Review of the Effectiveness of Acceptance and Commitment Therapy (ACT) for Body Image Dissatisfaction and Weight Self-Stigma in Adults. *J Contemp Psychother.* 2018.
- [33] Kashdan TB, Rottenberg J. Psychological flexibility as a fundamental aspect of health. *Clin Psychol Rev.* 2010;30:865-78.
- [34] Ciarrochi J, Bilich L, Godsell C. Psychological flexibility as a mechanism of change in acceptance and commitment therapy. *Assessing mindfulness and acceptance processes in clients: Illuminating the theory and practice of change.* Oakland, CA, US: Context Press/New Harbinger Publications; 2010. p. 51-75.
- [35] Montgomery K, Norman P, Messenger AG, Thompson AR. The importance of mindfulness in psychosocial distress and quality of life in dermatology patients. *Br J Dermatol.* 2016;175:930-6.
- [36] Dudek JE, Bialaszek W, Ostaszewski P. Quality of life in women with lipoedema: a contextual behavioral approach. *Qual Life Res.* 2016;25:401-8.
- [37] Acton AR, Mounsey E, Gilyard C. The burn survivor perspective. *J Burn Care Res.* 2007;28:615-20.
- [38] Blakeney PE, Rosenberg L, Rosenberg M, Faber AW. Psychosocial care of persons with severe burns. *Burns.* 2008;34:433-40.
- [39] Carr T, Moss T, Harris D. The DAS24: a short form of the Derriford Appearance Scale DAS59 to measure individual responses to living with problems of appearance. *Br J Health Psychol.* 2005;10:285-98.

- [40] Harris DL, Carr AT. The Derriford Appearance Scale (DAS59): a new psychometric scale for the evaluation of patients with disfigurements and aesthetic problems of appearance. *Br J Plast Surg*. 2001;54:216-22.
- [41] Moss TP. Manual for the Derriford Appearance Scale 24 (DAS24). Bradford on Avon: Musketeer Press; 2004.
- [42] Bond FW, Hayes SC, Baer RA, Carpenter KM, Guenole N, Orcutt HK, et al. Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: a revised measure of psychological inflexibility and experiential avoidance. *Behav Ther*. 2011;42:676-88.
- [43] Hayes SC, Strosahl K, Wilson KG, Bissett RT, Pistorello J, Toarmino D, et al. Measuring experiential avoidance: A preliminary test of a working model. *Psychol Rec*. 2004;54:553-78.
- [44] Gillanders DT, Bolderston H, Bond FW, Dempster M, Flaxman PE, Campbell L, et al. The development and initial validation of the cognitive fusion questionnaire. *Behav Ther*. 2014;45:83-101.
- [45] Flynn MK, Hernandez JO, Hebert ER, James KK, Kusick MK. Cognitive fusion among hispanic college students: Further validation of the Cognitive Fusion Questionnaire. *J Contextual Behav Sci*. 2018;7:29-34.
- [46] McCracken LM, Chilcot J, Norton S. Further development in the assessment of psychological flexibility: a shortened Committed Action Questionnaire (CAQ-8). *Eur J Pain*. 2015;19:677-85.
- [47] McCracken LM. Committed action: an application of the psychological flexibility model to activity patterns in chronic pain. *J Pain*. 2013;14:828-35.

- [48] Åkerblom S, Perrin S, Fischer MR, McCracken LM. A Validation and Generality Study of the Committed Action Questionnaire in a Swedish Sample with Chronic Pain. *Int J Behav Med.* 2016;23:260-70.
- [49] Wong WS, McCracken L, Wong S, Chen PP, Chow YF, Fielding R. The Chinese version of the 8-item Committed Action Questionnaire (ChCAQ-8): A preliminary analysis of the factorial and criterion validity. *Psychol Assess.* 2016;28:e111-8.
- [50] Baer RA, Smith GT, Hopkins J, Krietemeyer J, Toney L. Using self-report assessment methods to explore facets of mindfulness. *Assessment.* 2006;13:27-45.
- [51] Baer RA, Smith GT, Lykins E, Button D, Krietemeyer J, Sauer S, et al. Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment.* 2008;15:329-42.
- [52] Macleod R, Shepherd L, Thompson, AR. Post-traumatic stress symptomatology and appearance distress following burn injury: An interpretive phenomenological analysis. *Health Psychology.* 2016;35(11):1197-1204.
- [53] Zucchelli F, Donnelly O, Williamson H, Hooper N. Acceptance and commitment therapy for people experiencing appearance-related distress associated with a visible difference: Rationale and review of relevant research. *J Cogn Psychother.* 2018. ISSN 0889-8391 [In Press] Available from: <http://eprints.uwe.ac.uk/36073>.
- [54] Muftin Z, Thompson AR. A systematic review of self-help for disfigurement: Effectiveness, usability, and acceptability. *Body Image.* 2013;10:442-50.
- [55] Feliu-Soler A, Cebolla A, McCracken LM, D'Amico F, Knapp M, Lopez-Montoyo A, et al. Economic impact of third-wave cognitive behavioral therapies: a systematic

review and quality assessment of economic evaluations in randomized controlled trials. *Behavior Therapy*. 2018;49(1):124-147.

- [56] Biglan A, Hayes SC, Pistorello J. Acceptance and commitment: Implications for prevention science. *Prevention Science*. 2009;9(3):139-52.
- [57] Strosahl KD, Robinson PJ, Gustavsson T. Brief interventions for radical change: Principles and practice of focused acceptance and commitment therapy. 2012. New Harbinger.
- [58] Clark DM, Wells A. A cognitive model of social phobia. *Social phobia: Diagnosis, assessment, and treatment*. New York, NY, US: Guilford Press; 1995. p. 69-93.
- [59] Rudkin E, Medvedev ON, Siegert RJ. The Five-Facet Mindfulness Questionnaire: Why the Observing Subscale Does Not Predict Psychological Symptoms. *Mindfulness*. 2018;9:230-42.
- [60] de Bruin EI, Topper M, Muskens JG, Bogels SM, Kamphuis JH. Psychometric properties of the Five Facets Mindfulness Questionnaire (FFMQ) in a meditating and a non-meditating sample. *Assessment*. 2012;19:187-97.

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

Table 1: Demographic information

Variable	n (%)
Gender:	
Male	29 (37.2%)
Female	47 (60.3%)
Not stated	2 (2.6%)
Age:	M = 45.20, SD = 18.79
Time since burn (months):	M = 110.50 SD = 186.17
Cause of burn:	
Flame/fire/flash	36 (46.2%)
Scald	17 (21.8%)
Contact with hot object	9 (11.5%)
Chemical burn	8 (10.3%)
Explosion	3 (3.8%)

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

Friction Burn	2 (2.6%)
Other cause	1 (1.3%)
Not stated	2 (2.6%)
Area of body burnt:	
Head, face or neck	24 (30.8%)
Arms or hands	49 (62.8%)
Legs or feet	43 (55.1%)
Stomach or chest	31 (39.7%)
Back	14 (17.9%)
Buttocks or genitals	9 (11.5%)
Not stated	2 (2.6%)

PSYCHOLOGICAL FLEXIBILITY IN APPEARANCE ANXIETY

Table 2: Correlations between appearance anxiety and domains of psychological flexibility

Measure	Appearance Anxiety (DAS-24)
Acceptance (AAQ-II)	0.80 ^{***} _a
Cognitive Fusion (CFQ)	0.76 ^{***} _a
Committed Action (CAQ-8)	- 0.55 ^{***} _b
Mindfulness (FFMQ Observe)	0.27 [*] _b
Mindfulness (FFMQ Describe)	- 0.39 ^{***} _b
Mindfulness (FFMQ Act With Awareness)	- 0.57 ^{***} _b
Mindfulness (FFMQ Non Judge)	- 0.61 ^{***} _b
Mindfulness (FFMQ Non Reactivity)	- 0.28 ^{**} _b

Note: _a Spearman's correlation, _b Pearson correlation; * p < .05; ** p < .01; *** p < .001