



## Review article

# Cosmetic camouflage improves quality of life among patients with skin disfigurement: A systematic review

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## ABSTRACT

This study systematically reviewed the impact of cosmetic camouflage use on different psychosocial outcomes in patients with disfiguring skin disorders. Electronic databases and reference lists were searched in February 2018 for studies reporting the impact of cosmetic camouflage on different quality of life (QoL) outcomes. Eighteen studies met the inclusion criteria: six randomized controlled trials, two quasi-experimental studies, nine single group 'before and after' interventions, and one comparative study with single post-intervention measurement. Quality appraisal of included studies was undertaken using the Joanna Briggs critical appraisal tools. While the studies varied in design, those included in this review indicated significant improvement in QoL after the use of cosmetic camouflage. The mean reduction in Dermatological Life Quality Index scores ranged from 1.4 to 6.4 signifying improvement in QoL of participants after treatment with cosmetic camouflage. Cosmetic camouflage can be an effective therapy in improving QoL among patients with skin disfigurement.

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## 1. Introduction

The human skin, in addition to its physical function, presents elements about us such as age, ethnicity, general health, and our emotions through facial expressions (Allen, 2015). Skin purity forms part of the determinant of beauty (Sidle & Decker, 2011), something which is valued highly in Western cultures (Vuotto et al., 2017). Magin, Adams, Heading, and Pond (2011) identified that the societal ideal of flawless skin is largely influenced by the media's portrayals of perfection primarily targeted towards women. Living with skin disfigurement and resulting unusual appearance can be challenging in today's appearance-obsessed society. These challenges experienced by people with an altered visible appearance is well-reported (Harcourt et al., 2018). An altered appearance of the skin in visible places such as the face and extremities is more problematic as appearance impacts social interaction (Langlois et al., 2000) including fear of rejection, feelings of self-consciousness (Martin, Byrnes, McGarry, Rea, & Wood, 2017), and employment prospects (Gangl, 2006).

Skin disfigurements are deleterious visible differences to the skin which can result from a number of factors, including congenital deformities (e.g., oral cleft, port wine stains), burns, trauma injuries (e.g., abrasions, surgery, violence), skin diseases (e.g., acne, vitiligo, psoriasis, cancer), and even self-harm (Allen, 2015). Consequently, scarring is an essential part of the skin healing process that can take a number of months to be fully restored (Sidle & Decker, 2011), and a complete resolution of such conditions is often not possible. Scars can vary greatly in size, colour, texture and appearance.

Most skin disorders and disfigurements are considered less severe as they do not often cause direct physical impairment or death. However, there is a psychosocial and emotional impact (Harcourt et al., 2018; Sidle & Decker, 2011). Morgan, McCreedy, Simpson, and Hay, (1997) argue that disfigurement influences one's quality of life (QoL). The World Health Organization (2018) defines QoL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (p.1). A patient's QoL may be adversely affected due to personal dissatisfaction with appearance or response to the reaction of others (Rani et al., 2005). Though such disfigurement is a stressful experience for both sexes, women experience greater QoL impairment than their male counterparts (Borimnejad, Parsa Yekta, Nikbakht-Nasrabadi, & Firooz, 2006).

Individuals with discernible alterations are also more likely to experience stigmatization by staring, avoiding, and teasing (Chaturvedi, Singh, & Gupta, 2005; Lawrence, Rosenberg, Mason, & Fauerbach, 2011; Strauss et al., 2007). Brown, McKenna, Siddhi, McGrouther, and Bayat, (2008) identified scars interfering with patients' communication skills, personal relationships, work life, and leisure activities. Other effects noted among patients with altered skin conditions include social unease, difficulty in sexual relationships (Gooderham & Papp, 2015; Levy & Emer, 2012), psychological distress (Rumsey, Clarke, White, Wyn-Williams, & Garlick, 2004), suicidal ideation (Halvorsen et al., 2011; Picardi, Mazzotti, & Pasquini, 2006), reduced self-esteem (Dunn, O'Neill, & Feldman, 2011), anxiety, and depression (Baubert et al., 2011; Dalgard et al., 2015).

There are numerous surgical techniques that can be used to alter the appearance of, or minimise, scarring. Dermal fillers are

commonly used for facial soft tissue augmentation including acne scarring (Forbat, Ali, & Al-Niaimi, 2017; Wollina & Goldman, 2015), with Botox<sup>®</sup> also a suitable intervention for the prevention of hypertrophic scarring (Zhang, Liu, Xiao, & Xu, 2016). The use of Z-Plasty, a surgical procedure that improves the functional and cosmetic appearance of scars, can rearrange the direction of a scar and hence camouflage scar tissue (Hundeshagen, Zapata-Sirvent, Goverman, & Branski, 2017) and tissue expanders can replace and reduce a scar surface and conceal a scar (Ardeshirpour, Shaye, & Hilger, 2013). Whilst surgical interventions may provide both physical and psychosocial improvements, they are often costly and invasive procedures that may not be appropriate for all patients and clinical situations. Hence, non-surgical approaches that can provide similar outcomes provide an important alternative.

Tattooing has proven a successful permanent form of camouflage in instances where conventional methods are not indicated (Filinte & Akoz, 2014). Changes to hair styling can manage the appearance of forehead and scalp scars (Sidle & Decker, 2011). Additionally, laser therapy has the capacity to remove lesions to aid in the improvement of one's physical appearance. This can be further facilitated by the application of effective skin camouflage make-up (Townley, Bragg, Wright, & Cole, 2013). Each of these options offers the individual the opportunity to reduce the appearance of scarring, thereby reducing the emotional and social impacts associated with disfigurement. While patients often desire immediate results, topical and systemic therapies require regular and consistent use in order to achieve noticeable improvement (Levy & Emer, 2012). In some cases, no option exists for restoration of the skin, and hence patients have no other choice than living with an altered appearance (Antoniou & Stefanaki, 2006).

Cosmetic camouflage is a technique which uses cosmetics to conceal disfigurements immediately and normalise the appearance of the skin (Rayner, 2000). The therapy uses specific products, including powders, cover creams, and liquids, which can rapidly disguise the skin alteration (Rayner, 1995). Although perfect colour matches can be made difficult due to changing complexions (Kim, Chang, Hong, & Koh, 2011), camouflage has been found to improve well-being (McMichael, 2012), psychological experiences (Filinte & Akoz, 2014), and self-rated attractiveness with make-up (Jones & Kramer, 2016). There are some studies that suggest cosmetic camouflage benefits patients with skin conditions by increasing self-esteem and facial attractiveness (Mundy, Miller, Klassen, Cano, & Pusic, 2016), thereby enhancing one's perceived QoL (Khanche, 2012). However, a systematic appraisal of the quality of evidence and key trends in prior studies has yet to be undertaken. Hence, a systematic review was undertaken by the authors to document the evidence of cosmetic camouflage use on different QoL outcomes in patients with disfiguring skin disorders.

## 2. Method

The authors followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2010), which provides a structured framework for the reporting of systematic reviews. Original research published in peer-reviewed journals was systematically searched using PubMed, Scopus, CINHAL, and PsycINFO databases. The literature search was conducted in February 2018 with key words and Medical Subject Headings including cicatrix, make-up, camouflage,

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