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Mental health and itch in burns patients: Potential associations

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ABSTRACT

The purpose of this study was to investigate the relationship between mental health and self-reported itch in patients with burns across a 6 month time period and to test the hypothesis that poorer mental health outcomes are associated with increased severity of itch.

Method: A quantitative study with three time points for data collection was conducted. Participants (232) completed assessments at 1 month, 3 months, and 6 months after burn injury. The Patient and Observer Scar Assessment Scale (POSAS) was used to report itch and the Short Form Health Survey (SF-36) provided an assessment of mental health across time. Only data from the itch and mental health subscales were used in the analysis. To analyze the data a quantile regression model was used.

Results: Mental health is significantly associated with itch after adjusting for variation in itch over time ($p = 0.001$). The regression coefficient indicates that as mental health increases by one unit, itch decreases by 0.03. Of importance, the relationship remained significant after adjusting for total burn surface area ($p < 0.001$).

Conclusion: These findings suggest there is a relationship between mental health and itch. Given the powerful impact itch can have on an individual's wellbeing health professionals can begin to further investigate itch from a bio-psychosocial perspective. Further research to investigate causal relationships between mental health and itch is important.

1. Introduction

Pruritus, also commonly referred to as itch, has been defined as the sensation that induces the urge to scratch [1]. Twycross and colleagues defined four clinical categories of types of itch. These include itch that can be caused by puritoceptive, neurogenic, neuropathic or psychogenic stimuli [2]. Given the complex nature of the skin changes after burn, individuals having suffered burn injury may present

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with a mixed aetiology of a combination of these clinical subtypes of itch.

Itch in patients with burn injuries is a common complaint, with between 87 and 93% of adult burns patients reporting a problem with itch [3–5]. During the process of wound healing, it is considered normal for burns to cause an intense and discomforting itch [6], with the duration of itch varying from several weeks to several years [6]. Many factors are known to influence itching after burn, including % total body surface area (TBSA) of the injury, female gender, depth of the burn, healing time since injury and coping strategies employed by the patient [6–9]. Although the severity of itch has been shown to improve over time, some studies have shown prevalence rates of between 44 and 76% of patients continuing to suffer from itch at seven years after burn [5,6,10]. This research highlights the long lasting, chronic effect itch can play in the rehabilitation phase of individuals with burns.

Burns can be a traumatic experience due to the complex mix of pain responses, feelings of guilt or blame due to the cause of the injury, and feelings of concern for ones future. Studies indicate that both major and minor burn injuries can cause symptoms of depression, anxiety and posttraumatic stress disorder (PTSD) [11–13]. These symptoms can persist for some burn survivors, leading to mental illness that can endure for years after a burn.

Itch has been shown to have significant physical and psychological consequences after burn, including interference with sleep and daily activities, negatively impacting psychosocial wellbeing, and reopening wounds due to scratching [3,5,6]. Research conducted in the area of chronic skin disease and itch, shows that there is a relationship between symptoms of psychological distress and increased severity of itch [14,15]. In studies investigating itch in individuals with psoriasis and atopic dermatitis, results show that stress not only exacerbates itch, but stressful events in the month leading up to exacerbations causes more intense itch [14,16]. It has been shown that in response to stress, there is up regulation of neuropeptide mediators in the brain, endocrine organs and peripheral nervous system which causes the release of neuromediators that regulate inflammatory and immune function, causing an increase in severity of itch [16,17]. These findings have contributed to the development of a bio-psychosocial model of itch in patients with chronic skin diseases. The model describes the influence of personality, external stressors, and cognitive, behavioural and social factors on the psychological processes of itch [14]. This suggests that the management of itch in patients with chronic skin diseases should not only involve medication targeted towards the biological pathway of itch, but should also employ interventions aimed at addressing the psychological causes of itch [15,18]. This is further supported by a recent review exploring the psychological management of wound pruritus [19].

Studies presented so far, show that a bio-psychosocial model of itch is applicable in chronic skin diseases. There is limited research about the use of a bio-psychosocial model of itch to guide interventions that would complement the medical and surgical treatment plan within the burns population. Two studies in the area of burns have begun to investigate psychological factors that can predict severe itch in burns patients. These results show that symptoms of PTSD and anxiety related personality traits were found to predict severe and chronic itch in this population [3,7]. In addition research conducted in Korea shows that patients with depression report worse burn scars or sensation and are reported to have lower levels of burn-specific health [20]. These studies highlight the need to further explore itch in burns patients from a bio-psychosocial perspective. The aim of this study is therefore to address this gap in the literature and describe the relationship between self-reported itch and mental health over time in burns patients to test the hypothesis that poor mental health is associated with increased levels of self-reported itch.

2. Methods

2.1. *Participants & procedure*

Patients were included in this study if they were treated for a burn in the Royal Perth Hospital Burns Unit between 2010 and 2013, and had completed the Patient and Observer Scar Assessment Scale (POSAS) and the Short Form Health Survey (SF-36) during this time. Patients were excluded if they did not undergo hospital admission of at least 24 h. The data were collected as a part of routine clinical care from 2010 to 2013. Ethics approval was received from the RPH Human Research Ethics Committee (HREC), approval number ''REG 13-162''. Patient information was de-identified prior to analysis.

2.2. *Measures*

Data were collected via two self-reported questionnaires, the Patient and Observer Scar Assessment Scale (POSAS) and the Short Form Health Survey (SF-36), which provided information regarding self-reported itch and mental health status. Additional information regarding participant demographics (age, gender) and burn details (time since burn, TBSA, location, surgery) was also collected. The assessments were selected as they comprise part of the battery of current clinical assessments conducted on the burns unit as part of standard care. Although there are assessments currently available that consist of a more in-depth measurement of itch, these are not currently collected as part of the standard of care.

2.2.1. *The Patient and Observer Scar Assessment Scale (POSAS v2.0)*

The POSAS is a questionnaire consisting of two separate scales, one for the patient and one for the physician (observer). Both scales have been shown to be valid and reliable in burns populations, with good internal consistency (tested by Cronbach's alpha) for both scales and good test–retest reliability for the physician scale [21,22]. For the purposes of this study, the self-reported patient scale was used. The patient scale shows acceptable reliability, $\alpha = 0.76$, and measures self-reported pain, itch, colour, pliability, thickness, normality and ''overall opinion'' on a 10-point scale [21]. The total sum of the patient scale can range from 0 to 70, with high scores representing poor scar outcomes. This study used Question 2 (''Has the scar been itching the past few weeks?''),