Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/burns

Anxiety and depression after burn, not as bad as we think–A nationwide study

Andreas Nilsson [a,b,*], Lotti Orwelius [b,c], Josefin Sveen [d], Mimmie Willebrand [d], Lisa Ekselius [d], Bengt Gerdin [e,f], Folke Sjöberg [b,c,g]

[a] Department of Medical and Health Sciences, Faculty of Medicine and Health Sciences, Linköping University, Linköping, Sweden
[b] Department of Anesthesia and Intensive Care, Region Östergötland, Linköping, Sweden
[c] Department of Clinical and Experimental Medicine, Faculty of Medicine and Health Sciences, Linköping University, Linköping, Sweden
[d] Department of Neuroscience, Psychiatry, Uppsala University, Uppsala, Sweden
[e] Department of Surgical Sciences, Plastic Surgery, Uppsala University, Uppsala, Sweden
[f] Uppsala Burn Centre, Uppsala, Sweden
[g] Burn Centre in Linköping, Departments of Hand and Plastic Surgery, Linköping, Sweden

ARTICLE INFO

Article history:
Accepted 26 March 2019

Keywords:
Burns
Quality of life
Anxiety
Depression
Follow-up studies

ABSTRACT

Objective: A history of psychiatric disorders is more common among patients who have had burns than in the general population. To try and find out the scale of the problem we have assessed self-reported symptoms of anxiety and depression after a burn.
Methods: Consecutive patients with burns measuring more than 10% total body surface area or duration of stay in hospital of seven days or more were included. Personal and clinical details about the patients were extracted from the database at each center. Data were collected from the Hospital Anxiety and Depression Scale, as well as Health-Related Quality of Life (HRQoL; Short Form-36, SF-36) and questionnaires about socioeconomic factors. All results were obtained 12 and 24 months after the burn, and compared with those from a reference group.
Results: A total of 156 patients responded to the questionnaires. Mean (SD) age and TBSA (%) were 46 (16.4) years and 23.6 (19.2) %, respectively. There were no differences in incidence between the burn and reference groups in anxiety or depression either 12 or 24 months after the burn. Those who reported higher anxiety and depression scores also had consistently poorer HRQoL as assessed by the SF-36.
Conclusion: Seen as a group, people who have had burns report anxiety and depression the same range as a reference group. Some patients, however, express more anxiety and depression, and concomitantly poorer HRQoL. These patients should be identified, and offered additional support.

* *Corresponding author at*: Department of Medical and Health Sciences, Faculty of Medicine and Health Sciences, Linköping University, Linköping, Sweden.
E-mail address: andreas.nilsson@regionostergotland.se (A. Nilsson).
https://doi.org/10.1016/j.burns.2019.03.014
0305-4179/

1. Introduction

A burn can be a life-threatening and traumatic event associated with severe pain and long-term health problems. Psychological difficulties are often reported after a burn, and symptoms of depression are one of the most common [1,2]. In a systematic review of the prevalence of depression after a burn, 4%–10% met the criteria for major depression within a year after the burn, and the rate of clinically relevant depressive symptoms measured by self-reporting was 4%–26% [3]. In addition, depressive symptoms after a burn have been associated with deterioration in long-term physical functioning and health-related quality of life (HRQoL) [4–6].

For patients with burns, studies have reported symptoms of anxiety in hospital [7,8], but Williams and Griffiths [9] reported that one third of a sample of 23 survivors of burns were still having appreciable psychological difficulties one year after the burn. Anxiety was the most common, followed by post-traumatic stress syndrome and depression. Pre-existing mental health problems were one of the most important predictors of later psychological difficulties and psychiatric disorders after a burn [1,10]. It is important to gain information about factors that may predict outcome after injury, as this may facilitate our ability to reduce costs as well as to alleviate symptoms after burns. Additional factors that may influence the prediction of outcome include sex, age, and level of education [1,2,11].

To analyse the mental health of patients with burns further, we extended a previous study [12], which concluded that poorer HRQoL was recorded for patients with burns mainly in the mental dimensions when compared with a reference group without burns (after adjustments for age, sex, and pre-existing conditions). Unemployment was the most important factor, and it affected several dimensions of HRQoL. These data support the hypothesis that HRQoL is impaired by factors other than the burn itself.

The aim of this study, therefore, was to assess the self-reported symptoms of anxiety and depression reported at 12 months and 24 month after injury by patients with severe burns, and to compare them with those from a reference group. We also wanted to try and explain in more detail the impact on patients' mental health of pre-existing conditions and association with the burn itself. Our initial hypothesis was that anxiety and depressive symptoms are more prevalent in those with burns than in a reference population.

2. Material and methods

The Burn Centres in Linköping and Uppsala are the two burn centres with nationwide responsibility for treating patients with severe burns in Sweden. Their catchment area includes 9.5 million inhabitants, and admission criteria are based on the recommendations from the American Burn Association [13]. The study was designed according to the principles of the Declaration of Helsinki [14] and was approved by the regional ethics boards in Linköping and Uppsala.

Patients in the study were enrolled consecutively during 9 years. The inclusion criteria were age 18 years or older (no upper limit in age); proficiency in the Swedish language; and either burns of 10% total burn surface area (TBSA) or more, or duration of stay in hospital of seven days or more. In Linköping all patients admitted during the specified time period were contacted by mail 12 and 24 months after the burn. The patients in Uppsala were part of the follow-up of an ongoing study, and assessments were made 3, 6, 12, and 24 months after the burn; only the data from the 12 and 24 months' assessments were considered in this study.

Participants were sent self-reporting questionnaires and were instructed to complete them and return them in prepaid envelopes. Participants from Uppsala who did not return the questionnaire within one month were sent a reminder letter. Participants in Linköping who had not responded within two weeks received a reminder call and, if necessary, a letter.

During the study period, 279 patients fulfilled the inclusion criteria. Fifty-five (20%) of these were lost to follow up (two numbers of death during follow up and one during hospital stay), 41 (15%) declined to participate (32 in Linköping and 9 in Uppsala) and 14 (5%) were lost for administrative reasons (Uppsala).

A total of 169 (61%) participants were included in the study and data from all patients that completed the HADS-form at least once were analyzed; 159 (57%) answered the Hospital Anxiety and Depression Scale (HADS) at the 12 months' assessment; 117 at the 24 months' assessment; 112 at both assessments; five participants did not complete the HADS at either assessment and were excluded, leaving 164 participants to be included in the analysis, 87 patients from Linköping and 77 from Uppsala. Present data at every time was used for the analysis. There were no significant differences between the responders (n = 164) and the non-responders (n = 110) in sex, age, duration of stay, TBSA (%), or days on the ventilator, except that the responders had larger median TBSA (26%) compared with the non-responders (19%), $p < 0.01$.

Data about symptoms of anxiety and depression were compared with data from a reference group (reference group A). The participants in the reference group was a cohort of 521 individuals selected with the aid of the central governmental authority for administration and production of official statistics (Statistics Sweden; SCB) and were Swedish citizens selected to match the burn group in terms of age, sex, marital status, place of residence (county), and origin (immigrant/not immigrant). Data from a public health survey of the county of Östergötland (the area in which one of the burn centres is situated) were also used for comparison of HRQoL and coexisting conditions (reference group B). The survey had been designed to monitor the general health of the population in a different study, and was completed during 1999 [15]. Questionnaires were initially sent out to 10,000 people aged 18–74 years. After two reminders, 6093 (61%) had responded.

The HADS was used to assess symptoms of general anxiety and depression. The HADS is accepted by patients, easily completed and contain 14 items. Each of the two subscales, "A - anxiety" and "D - depression", consists of seven items to distinguish between depression and anxiety [16]. Each item is rated on a scale of 0–3, where 0 equals no symptom and 3 equals severe symptoms. Scores for each subscale can range from 0 to 21 with scores categorised as follows: 0–7, 8–10, and 11–21 [16,17]. The HADS is used extensively in health care and has

been evaluated in several clinical investigations with satisfactory results [18]. We refers to 0–7 as normal score (anxiety/depression is not likely); 8–10 as low score (could indicate presence of anxiety/depression); 11–21 as moderate/high score (indicate anxiety/depression is likely). The entire HADS, evaluated by Zigmond and Snaith, can be read in the original publication [17].

The Swedish version of SF-36 [19,20] was used to evaluate HRQoL. The instrument is internationally known and has been recommended for assessment of HRQoL in critical care [21]. SF-36 has been validated in a representative Swedish sample [19], and in burned patients [22]. It has 36 questions and generates a health profile of eight subscale scores where four subscales relate to physical dimensions (physical functioning; physical role; bodily pain; or general health), and four to mental dimensions (vitality; social functioning; emotional role; or mental health) [19]. The scores of all the subscales are transformed into a scale ranging from 0 (the worst) to 100 (the best). Of the greatest importance are the changes over time, not the actual value or an average value.

Data about age, sex, and severity of injury were extracted from the medical records. Severity of injury was assessed by the TBSA (%), percentage of the total body surface area with full-thickness burns (TBSA-FT), duration of stay in the Burn Centre, and days on the ventilator. Level of education, marital status, working status, ongoing sick leave or not, pre-existing conditions, and self-reported diagnoses were obtained from the questionnaire 12 and 24 months after the burn. The question about the self-reported diagnoses was: "Have you had any significant illness, reduced bodily function or other medical problem, and had it for more than 6 months before admission to the Burn centre?" with the option to answer "yes" or "no". This question also listed possible pre-existing illnesses: cancer; diabetes; heart failure; asthma or allergy; rheumatism; gastrointestinal, blood, kidney, psychiatric, or neurological disease; thyroid or any other metabolic disturbance; or any other long-term illness. The last was an open question with a space for free text. For the Uppsala sample information regarding pre-existing diseases was collected from the medical records. Data about psychiatric disorders assessed by the Structured Clinical Interview for the DSM-IV Axis I disorders (SCID I) was available in a subsample of the Uppsala sample, in addition to data from the patients.

2.1. *Statistical analysis*

The significance of differences between groups was assessed with the aid of Student's *t* test for continuous data or with the chi square test for categorical data using Fisher's exact test when appropriate. For analyses of numbers of patients in which their anxiety or depression (normal, low or moderate/high scores) were summarised, a probability of less than 0.01 was accepted as significant because of repeated comparisons. Probabilities of less than 0.05 were accepted elsewhere. We used linear regression to establish predictive models, with HADS anxiety and HADS depression as the dependent variables. The possible predictive variables used were demographics and TBSA, duration of stay and time on ventilator. These were examined using Student's *t* test and chi square analysis, and those with probabilities of 0.25 or less were included in subsequent forward stepwise regressions. Because of skewed distributions, data on TBSA, duration of stay and days on ventilator were logarithmically transformed. Missing data from the instruments were handled by including the data

Table 1 – Demographic data for study and reference groups. Data are numbers (%).

	Study group (n = 164)	Reference group B (n = 6093)	p-Value
Mean (SD) age (years)	45.5 (15.5)	46 (15.1)	0.673
Sex: male	127 (77)	2822 (46)	<0.001
Education			
Compulsory school only	49 (30)	1881 (31)	0.843
High school/university	22 (13)	1350 (22)	0.027
Marital status			
Single	72 (46)	1312 (22)	<0.001
Married/cohabit	72 (46)	4414 (74)	<0.001
Widow/widower	12 (8)	275 (5)	0.110
Born in Sweden	147 (90)	5494 (91)	0.959
Employment before stay at the Burn centre			
Employed/leader	106 (65)	3538 (58)	0.396
Retired	33 (20)	1132 (19)	0.680
Other[a]	25 (15)	1423 (23)	0.047
12 months after stay at the Burn centre			
Employed/leader	73 (45)		
Retired	37 (23)		
Other	53 (32)		

[a] Other includes students, homemakers or unemployed.

given at every time period for follow-up, as results on a group level were important. All analyses were made with the help of the statistical package IBM SPSS Statistics for Windows, or Mac (version 21.0 IBM Corp, Armonk, NY, USA) or Statistica (version 10, Dell, Tulsa, USA).

3. Results

Patients' personal and clinical data and coexisting conditions are shown in Tables 1 and 2. The mean age of the participating patients and the reference groups (A; B) did not differ significantly, but the groups did differ in level of education, male sex, marital status, and other employment; compared to the reference, there were less with university education, more males and singles/less married in study group. Analyses that contrasted participants from the Uppsala compared with the Linköping Burn Centre showed no differences in age, sex, TBSA (%), TBSA-FT, duration of stay, or days on ventilator (data not shown).

3.1. *Symptoms of anxiety and depression*

In the study sample scores for anxiety and depression were rated low, and comparable to those rated in the reference group. The mean (SD) score for anxiety was 5.7 (4.6) and for depression 4.6 (4.0) at 12 months, and at 24 months 5.8 (4.6) and 4.7 (4.4), respectively. In the reference group, the mean (SD) scores were 7.2 (4.1) and 4.4 (3.2) for anxiety and depression respectively. There were no differences in mean scores of anxiety and depression between the burn and the reference groups (anxiety at 12 months $p = 0.12$; depression at 12 months $p = 0.13$; anxiety 24 months 0.06), except for a significant difference in depression score between the patients 24 months after the burn and the reference group ($p = 0.031$). Table 3 shows that the incidences of all scores failed to differ significantly between the study and the reference groups (A).

3.2. *Regression analysis of anxiety and depression*

Anxiety could be predicted if the patient had a pre-existing condition and was unemployed. Also, regression analysis showed that symptoms of depressions 12 months after a burn were predicted by having pre-existing disease, higher TBSA-FT, and unemployment at time of the study (Table 4).

3.3. *Association of anxiety and depression with HRQoL*

When we compared HRQoL between the separate groups of patients who rated their anxiety at 12 and 24 months at a normal, low, or moderate/high score, we found that some dimensions were severely affected. For patients with the highest anxiety scores, physical role and emotional role were the most affected at 12 months ($p < 0.001$). By 24 months, those dimensions were significantly still more affected ($p < 0.01$ in both dimensions) (Figs. 1 and 2).

4. Discussion

The main results from the present study are that patients with burns tend to have similar degrees of anxiety and depression as a reference population. Of the study population 70% did not report signs of anxiety, neither at 12 nor at 24 months after the

Table 2 – Comorbidity for the both groups and clinical data for the study group. Data are numbers (%) except where otherwise stated.

	Study group (n = 164)	Reference group B (n = 6093)	p-Value
Coexisting conditions:	76 (46)	1707 (28)	<0.001
Psychiatric disease	24 (14.6)	99 (1.6)	<0.001
Asthma/allergy	13 (7.9)	146 (2.4)	<0.001
Heart failure	16 (9.8)	810 (13.3)	0.240
Neurological disease	9 (5.5)	72 (1.2)	<0.001
Diabetes	6 (3.7)	95 (1.6)	0.040
Gastrointestinal disease	4 (2.4)	306 (5.0)	0.148
Cancer	3 (1.8)	32 (0.5)	0.029
Miscellaneous	19 (12.2)	722 (11.8)	0.927
Coexisting conditions:			
0	85 (54.5)	4386 (72)	0.015
1	60 (38.5)	1411 (23.2)	0.003
>1	11 (7.0)	296 (4.8)	0.307
Sick leave before stay in burn care	8 (5)	75 (1.2)	<0.001
Sick leave at 24 months	43 (26)		
Median (IQR; min–max) TBSA (%)	19 (26; 1.3–85.5)		
Median (IQR; min–max) TBSA-FT, (%)	8 (22; 0–85.5)		
Median (IQR; min–max) duration of stay, days	20 (21; 1–234)		
Median (IQR; min–max) days on ventilator	0 (10; 0–117)		

TBSA = total body surface area, TBSA-FT = total body surface area-full thickness IQR = interquartile range, min = minimum value, max = maximum value.

Table 3 – Anxiety and depression (HADS) for the Burn patients at 12 and 24 months compared with the reference group. Data are numbers (%).

	Study group	Reference group A	p Value
Anxiety 12 months:	n = 159	n = 515	
Normal scores	111 (69.8)	314 (60.3)	0.303
Low scores	22 (13.8)	99 (19.0)	0.208
Moderate/high scores	26 (16.4)	102 (19.6)	0.448
Anxiety at 24 months:	n = 117	n = 515	
Normal scores	83 (70.9)[1]	314 (61.9)	0.398
Low scores	12 (10.3)[2]	99 (19.5)	0.043
Moderate/high scores	22 (18.8)[3]	102 (20.1)	0.792
Depression 12 months:	n = 159	n = 507	
Normal scores	129 (81.1)	418 (80.2)	0.934
Low scores	15 (9.4)	62 (11.9)	0.441
Moderate/high scores	15 (9.4)	27 (5.2)	0.070
Depression at 24 months:	n = 117	n = 507	
Normal scores	90 (76.9)[4]	418 (82.4)	0.655
Low scores	13 (11.1)[5]	62 (12.2)	0.766
Moderate/high scores	14 (12.0)[6]	27 (5.3)	0.016

[1] p = 0.933 compared to anxiety 12 months.
[2] p = 0.428.
[3] p = 0.657.
[4] p = 0.772 compared to depression 12 months.
[5] p = 0.681.
[6] p = 0.543.

Table 4 – Impact of different factors on anxiety and depression at 12 months from linear multiple regression analysis. First row of data are p value (bold when significant); second row are beta coefficient and in brackets 95% CI of beta coefficients. The beta coefficient indicates how much scores of anxiety and depression change when the independent variable increases by one unit.

Variable	Anxiety p-Value Beta coefficient (95% CI)	Depression p-Value Beta coefficient (95% CI)
TBSA	0.535 −0.01 (−0.05 to 0.03)	0.463 −0.02 (−0.07 to 0.03)
TBSA-FT	0.416 0.03 (−0.04 to 0.09)	**0.015** 0.05 (0.01 to 0.09)
Duration of stay	0.971 −0.01 (−0.05 to 0.05)	0.675 0.01 (−0.03 to 0.04)
Time on ventilator	0.931 −0.01 (−0.08 to 0.08)	0.899 0.01 (−0.07 to 0.08)
No pre-existing disease	**0.042** −1.46 (−2.86 to −0.06)	**0.002** −1.96 (−3.18 to −0.74)
Male sex	0.812 −0.20 (−1.86 to 1.46)	0.755 0.23 (−1.23 to 0.06)
Age	0.181 −0.03 (−0.07 to 0.01)	0.311 0.02 (−0.02 to 0.06)
Sick leave at 12 months	0.244 1.08 (−0.74 to 2.90)	0.192 1.08 (−0.55 to 2.70)
No employment at 12 months	**0.001** 1.15 (0.49–1.81)	**0.023** 0.68 (0.09–1.27)
Education		
Higher than compulsory school	0.411 0.69 (−0.97 to 2.36)	0.584 −0.40 (−1.86 to 1.05)
High school/university	0.081 −1.94 (−4.11 to 0.23)	0.061 −1.86 (−3.80 to 0.08)
Marital state	0.854	0.184
Single	0.14 (−1.35 to 1.63)	0.84 (−0.40 to 2.08)

Adjusted for age and sex; TBSA = total body surface area; TBSA-FT = total body surface area-full thickness.

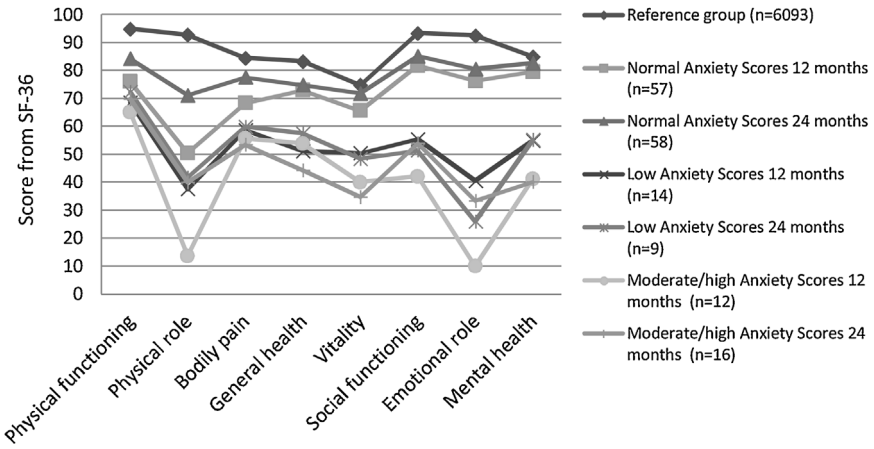

Fig. 1 – Data on 83 patients and the relation between dimensions of health related quality of life (HRQoL) measured by SF-36 (mean values) and the patients' level of anxiety at 12 and 24 month after burn care compared with the reference group B. Normal anxiety score means anxiety is not likely; low scores could indicate presence of anxiety; moderate/high score indicate anxiety is likely.

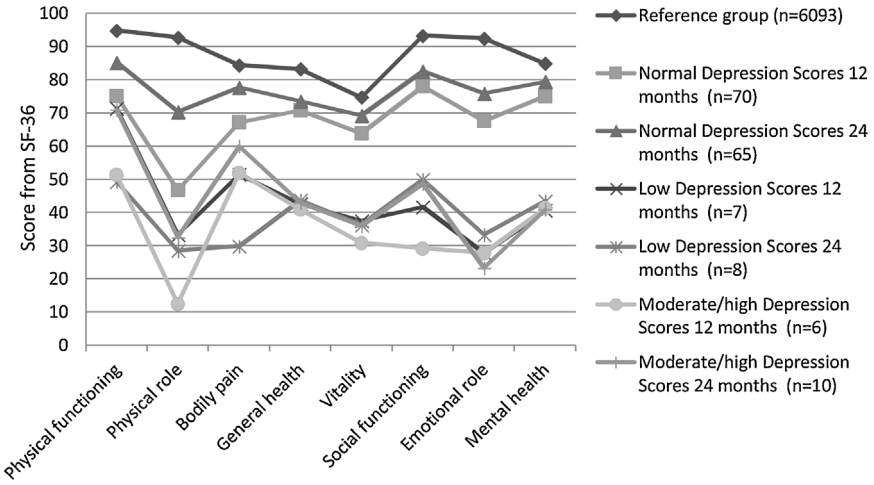

Fig. 2 – Data on 83 patients and the relation between himensions of health related quality of life measured with SF-36 (mean values) and the patients' level of depression at 12 and 24 month after burn care compared with the reference group B. Normal depression score means depression is not likely; low scores could indicate presence of depression; moderate/high score indicate depression is likely.

burn, and similarly, more than 75% did not report signs of depression. These scores were similar to the ratings made by the reference group (A). However, some patients do have a low and moderate/high rated scores for anxiety and depression, but so do people in the reference group. The exception seems to be a small subgroup of patients who still rate their depression as moderate/high 24 months after the burn.

Compared with other patients treated in ICU (multiple causes) patients with burns have a similar incidence of depression; moderate/high scores are reported with a prevalence of 13% (95% CI 10-16) 12 months after injury [23]; comparable data at 24 months were not available. The prevalence of depression after coronary artery by-pass surgery was also similar to data in the present study [24].

Since at least 1991 [9] it has been suggested that long-term psychological consequences are common after burns (over one-third of the patients). Signs of psychiatric disturbance among burned patients commonly develop during the hospital stay, and include increased signs of depression and anxiety, as well as post-traumatic stress disorder (one patient in five within six months) [25]. It has been suggested [12,26] that after adjustment of the burned patients' higher prevalence of mental health disorders (depression and substance misuse), their incidence over time is comparable to that of controls. These studies support the interpretation of the data in the present study: anxiety and depression may not be over-represented later after a burn compared with controls, if coexisting conditions are normal or they are compared to

another group of patients, e.g., postoperative after major surgery.

In an earlier published study, from our group, we reported that in the mental dimensions of SF-36 (vitality, social functioning, emotional role, and mental health), 8-34% of the patients had a value less than two SD below that of the reference group [12]. Nevertheless, expressions of disturbed mental health must be screened for and treated. The reasons for that are uncontested, but one substantial effect of early treatment of anxiety and depression is that it may reduce a broad range of long-term, pain-related outcomes after the burn [8].

Screening for mental health problems is important in burn care, and easily assessed factors can guide further assessment. In the multiple regression analysis we found that pre-existing diseases and unemployment contributed to higher levels of anxiety and depression. This is supported by recently published data that suggested that anxiety and depression before burn injury [26] or CABG surgery [27] correlated with increased symptoms of mental discomfort. Additionally, the fact that a burn was full-thickness also contributed to symptoms of depression.

However, connecting symptoms of anxiety and depression with HRQoL may help towards greater understanding. In the present data a low score on the dimensions "physical functioning" and "physical role" correlate with expressed symptoms of anxiety and depression. At the same time, mobility seems to be the key variable for higher perceived HRQoL, both physical and mental [28]. Improved mobility to enable a return to work is also crucial. It has recently been shown that two-thirds of the acute patients admitted to the burn centre [29] returned to work within six months. Those who returned to work had smaller mean percentage burned areas (6% compared with 16%) and hand burns were less common (41% compared with 71%) than among those who did not return to work. The presence of depressive disorders was also less common during follow-up, (3% compared with 31%. Having a major depressive disorder significantly predicted not returning to work (OR 55.3, 95% CI 3–997; $p = 0.007$). This emphasises the importance of screening all patients for impaired mental wellbeing, where the data suggest that depressive disorders are of most concern. Moderate or high scores from the HADS may be more apparent at 24 months after a burn. Because our comparison with the reference group showed that mental wellbeing is also impaired in a group of people who did not have a burn, but had other diseases or disorders, one could be led to think that a burn is more often associated with a pre-existent anxiety or depression disorder, that may lead to increased incidence of impaired mental wellbeing after-burn This is however disclaimed by Logsetty et al. [26] who found no increased incidence of mental health disorders during a 24 month follow-up period after care of a burn compared with a control group.

Limitations of the study: The present data should be interpreted with caution. We think that patients in our healthcare organisation are honest when answering questionnaires, and in those two burn centres both patients and personnel handle enquiry sheets daily. Compared with structured interviews, questionnaires may not include or pick up minor doubts, denial behaviour, or severe mental disorders that include anxiety or depression. Clinical professional interviews are more likely to show the whole picture, as were done at the Uppsala Burn centre for the pre-existing psychiatric disorders [10]. The HADS instrument is, however, commonly used, gives comparable data and, for this purpose, provides us with the knowledge to screen for mental health problems. Missing data were handled by including the data given at every follow-up time period, as results on a group level were of importance. A complete record could have meant yet more differences, although our results are comparable with already published data.

Furthermore, we have used two reference groups with the study group. Group A aided the comparison of anxiety and depression, and since this group was matched to the study group, we believe that the incidence of mental wellbeing is of the same range, independently of whether you have burns or not. The differences between study group and reference B on sex, marital status, level of education and co-morbidity may certainly have influenced the out-come from the regression analysis, but as we stated earlier, in the meaning that less pre-existing diseases lowers the risk for symptoms of anxiety and depression at 12 and 24 months after a burn. We therefore estimate the significance of the differences of less meaning.

A strength of this study is that it included patients who were examined over time and were recruited from the two national burn centres in a socioeconomically homogeneous country, and particularly includes two relevant and large reference groups (A;B). This is a strength of the comparison of burned patients with a group of other people; data can be related to a group exposed to other diseases and disorders. Extensive follow-up periods (1–2 years) are also crucial as it is well known that it takes considerable time to adjust after a major injury. The study is also important from the perspective that there are subgroups with important problems where directed help or treatment may be valuable.

5. Conclusion

Seen as a group, people injured by a burn report anxiety and depression the same as a reference group. Some patients, however, express these symptoms, and at the same time report a poorer HRQoL, although it is more likely that anxiety, depression, and poor quality of life comes from the fact that burned patients tended to have more coexisting conditions beforehand. High quality care must include an efficient identification of this subgroup to enable competent professional support and treatment.

Conflict of interest

None.

Funding

None of the authors have any financial interests to disclose.

REFERENCES

[1] Sareen J, Erickson J, Medved MI, Asmundson GJ, Enns MW, Stein M, et al. Risk factors for post-injury mental health problems. Depress Anxiety 2013;30:321–7.
[2] Van Loey NE, Van Son MJ. Psychopathology and psychological problems in patients with burn scars: epidemiology and management. Am J Clin Dermatol 2003;4:245–72.
[3] Thombs BD, Bresnick MG, Magyar-Russell G. Depression in survivors of burn injury: a systematic review. Gen Hosp Psychiatry 2006;28:494–502.
[4] Ullrich PM, Askay SW, Patterson DR. Pain, depression, and physical functioning following burn injury. Rehabil Psychol 2009;54:211–6.
[5] van Loey NE, van Beeck EF, Faber BW, van de Schoot R, Bremer M. Health-related quality of life after burns: a prospective multicenter cohort study with 18 months follow-up. J Trauma Acute Care Surg 2012;72:513–20.
[6] Thombs BD, Bresnick MG, Magyar-Russell G, Lawrence JW, McCann UD, Fauerbach JA. Symptoms of depression predict change in physical health after burn injury. Burns 2007;33:292–8.
[7] Wisely JA, Hoyle E, Tarrier N, Edwards J. Where to start? Attempting to meet the psychological needs of burned patients. Burns 2007;33:736–46.
[8] Edwards RR, Smith MT, Klick B, Magyar-Russell G, Haythornthwaite JA, Holavanahalli R, et al. Symptoms of depression and anxiety as unique predictors of pain-related outcomes following burn injury. Ann Behav Med 2007;34:313–22.
[9] Williams EE, Griffiths TA. Psychological consequences of burn injury. Burns 1991;17:478–80.
[10] Dyster-Aas J, Willebrand M, Wikehult B, Gerdin B, Ekselius L. Major depression and posttraumatic stress disorder symptoms following severe burn injury in relation to lifetime psychiatric morbidity. J Trauma 2008;64:1349–56.
[11] Davydow DS, Katon WJ, Zatzick DF. Psychiatric morbidity and functional impairments in survivors of burns, traumatic injuries, and ICU stays for other critical illnesses: a review of the literature. Int Rev Psychiatry 2009;21:531–8.
[12] Orwelius L, Willebrand M, Gerdin B, Ekselius L, Fredrikson M, Sjoberg F. Long term health-related quality of life after burns is strongly dependent on pre-existing disease and psychosocial issues and less due to the burn itself. Burns 2013;39:229–35.
[13] American Burn Association's Guidelines for the Operation of Burn Centers, http://www.ameriburn.org/Chapter14.pdf, viewed 2016-01-13, 09:30.
[14] WMA Declaration of Helsinki — Ethical Principles for Medical Research Involving Human Subjects, http://www.wma.net/en/30publications/10policies/b3/, viewed 160113, 10:08.
[15] Östgötens hälsa och miljö. Rapport 2000:1. Folkhälsovetenskapligt Centrum. Landstinget i Östergötland.
[16] Snaith RP, Zigmond AS. The hospital anxiety and depression scale. Br Med J 1986;292:344.
[17] Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67:361–70.
[18] Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. J Psychosom Res 2002;52:69–77.
[19] Sullivan M, Karlsson J, Ware Jr. JE. The Swedish SF-36 Health Survey—I. Evaluation of data quality, scaling assumptions, reliability and construct validity across general populations in Sweden. Soc Sci Med 1995;41:1349–58.
[20] Ware Jr. JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992;30:473–83.
[21] Angus DC, Carlet J. Surviving intensive care: a report from the 2002 Brussels Roundtable. Intensive Care Med 2003;29:368–77.
[22] Edgar D, Dawson A, Hankey G, Phillips M, Wood F. Demonstration of the validity of the SF-36 for measurement of the temporal recovery of quality of life outcomes in burns survivors. Burns 2010;36:1013–20.
[23] Rabiee A, Nikayin S, Hashem MD, Huang M, Dinglas VD, Bienvenu OJ, et al. Depressive symptoms after critical illness: a systematic review and meta-analysis. Crit Care Med 2016;44:1744–53.
[24] Korbmacher B, Ulbrich S, Dalyanoglu H, Lichtenberg A, Schipke JD, Franz M, et al. Perioperative and long-term development of anxiety and depression in CABG patients. Thorac Cardiovasc Surg 2013;61:676–81.
[25] Fidel-Kinori SG, Eiroa-Orosa FJ, Giannoni-Pastor A, Tasque-Cebrian R, Arguello JM, Casas M. The Fenix II study: a longitudinal study of psychopathology among burn patients. Burns 2016;42:1201–11.
[26] Logsetty S, Shamlou A, Gawaziuk JP, March J, Doupe M, Chateau D, et al. Mental health outcomes of burn: a longitudinal population-based study of adults hospitalized for burns. Burns 2016;42:738–44.
[27] Middel B, El Baz N, Pedersen SS, van Dijk JP, Wynia K, Reijneveld SA. Decline in health-related quality of life 6 months after coronary artery bypass graft surgery: the influence of anxiety, depression, and personality traits. J Cardiovasc Nurs 2014;29:544–54.
[28] Renneberg B, Ripper S, Schulze J, Seehausen A, Weiler M, Wind G, et al. Quality of life and predictors of long-term outcome after severe burn injury. J Behav Med 2014;37:967–76.
[29] Palmu R, Partonen T, Suominen K, Vuola J, Isometsa E. Return to work six months after burn: a prospective study at the Helsinki Burn Center. Burns 2015;41:1152–60.