ORIGINAL REPORT

RETURN TO WORK AND HEALTH-RELATED QUALITY OF LIFE AFTER BURN INJURY

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Objective: Although severe burn injury is associated with long-term rehabilitation and disability, research on returning to work in burn patients is limited. The aims of this study were: (*i*) to explore injury- and personality-related predictors of returning to work, and (*ii*) to compare health-related quality of life and health outcome in working versus non-working individuals.

Design: Cross-sectional study.

Subjects: Forty-eight former patients with pre-burn employment were evaluated on average 3.8 years after the burn.

Methods: Data were collected from medical records and by a questionnaire in which the patients were asked about their main activity status described in the terms: work, studies, pension, disability pension, sick leave or unemployment. It also contained the Swedish universities Scales of Personality, SF-36, Burn Specific Health Scale-Brief, items assessing fear-avoidance, Impact of Event Scale-Revised and Hospital Anxiety and Depression Scale.

Results: Thirty-one percent had not returned to work. In logistic regression, returning to work was associated with time since injury, the extent of full-thickness injuries, and the personality trait embitterment. Those who did not work had lower health-related quality of life, poorer burn-specific health, more fear-avoidance and more symptoms of post-traumatic stress disorder, but they did not differ from those who were working regarding general mood.

Conclusion: Returning to work was explained by both injury severity and personality characteristics. Those who did not work were characterized by low health-related quality of life and poorer trauma-related physical and psychological health.

Key words: adjustment, burns, BSHS-B, personality, SF-36, trauma.

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INTRODUCTION

Being in employment is associated with a higher degree of satisfaction with life, both in the general population (1) and in patients with physical injuries (2). In addition, absence from work is expensive for the community, considering health insurance (sickness benefit) and high company costs (3). Risk factors for longer duration of absence after injury and lower probability of return to work are admission to an intensive care unit, long length of stay, and low level of education among the patients (4).

The above-mentioned risk factors are prevalent among patients with severe burn injuries (5). A severe burn injury affects most systems in the body, and patients often require respiratory support in addition to wound treatment. With modern wound care, superficial burns heal spontaneously in about 2 weeks while deep, full-thickness burns need surgical interventions such as early excision and skin grafting. Patients often experience severe pain and anxiety during the prolonged treatment. Surgical techniques and treatments have evolved rapidly during recent decades, and mortality rates have decreased dramatically. Following this trend, there is now greater focus on the consequences of surviving a massive burn, and the social and psychological factors involved in recovery.

Burn injuries are associated with long-term health problems. Common physical symptoms after a burn injury are pain and sensory problems, pruritus, and loss of strength. Recently, it has been shown that perceived health problems (6) after burn injury can persist for several decades. In addition, between 13% and 23% of patients develop depression, and 13–45% develop post-traumatic stress disorder (PTSD) after hospital discharge (7).

Although burn patients experience several health problems in the long term, a follow-up of adult burn patients after 2–10 years showed that they generally do not differ regarding health-related quality of life (HRQoL) compared with normative data (8). Previous studies have also indicated that most burn patients return to work. It was found that although job disruption was common, 90% of burn patients returned to work within 2 years (9). In a Swedish sample of burn patients who had been injured at work, 83% were working again on average 9 years after the injury (10). The individuals who were not working at follow-up reported more pain and a poorer outcome in the areas of perceived ability to work, body image, affect, interpersonal relationships, and ability to take care of the skin (10).

Factors that have been related to return-to-work rates are total body surface area burned (TBSA) (9, 11–13), extent of full-thickness burns (TBSA-FT), length of stay (LOS) in the burn unit, number of surgical procedures, perceived functioning (12), age (11, 13), and prior psychiatric illness (9, 14). One

of the most influential factors is pre-burn employment (13–15). It is highly likely that some of these factors are interrelated: for instance, being employed before the burn is likely to be related to pre-burn psychiatric illness and physical functioning (16). In order to find factors that impede return to work – and not employment as such – those who were unemployed before the burn should be excluded from the analysis. When including only patients who were employed before the burn, return to work has been predicted by ethnicity, marital status and not blaming oneself for the injury (15). This indicates that psychological factors are involved in the process of returning to work. In other patient groups, it has been seen that personality traits can be predictive of working status. For example, patients with introverted personality traits are more likely to fail in returning to work after suffering a myocardial infarction (17). Furthermore, dysfunctional beliefs such as fear-avoidance have also been associated with functional outcome. Fear-avoidance is the fear of re-injury or harm, which is accompanied by avoidant behaviour and poor functioning. It is a known risk factor for development of chronic pain (18). Fear-avoidance was recently investigated in burn patients and a strong association was found with perceived ability to work (19). To our knowledge, there have been no studies on the association between fear-avoidance and actual working status after burn injury.

The aims of the present study were: (*i*) to evaluate which factors are associated with the likelihood of returning to work, and (*ii*) to investigate what differentiates the group that has returned to work from the group that has not, in terms of HRQoL, perceived burn-specific health, dysfunctional beliefs and psychological symptoms.

In this study, the term "predictive variable" is used for (*i*) burn-related and socio-demographic variables that reflect the patient's status at the time of injury, although the information was extracted from medical records at a later time point, and (*ii*) personality traits that reflect stable behaviour patterns in an individual with respect to time and different situations (20, 21). These variables are considered to be *statistically* predictive, and their causal relationships to the criterion variable cannot be firmly established using this cross-sectional research design.

METHODS

Participants and procedure

Former patients were included if they: (*i*) had been admitted to the Burn Unit at Uppsala University Hospital between January 1996 and March 2000, and (*ii*) were 18 years or older at the time of the investigation in October 2001. Former patients who had no registered address ($n = 6$), were not Swedish citizens and did not live in Sweden ($n = 4$), or who had dementia ($n = 2$) were excluded. The final sample of eligible participants consisted of 116 former burn patients. The Burn Unit in Uppsala is 1 of the 2 existing Burn Units in Sweden with national responsibility for burn care. The main referral area covers about 3 million of the 9 million inhabitants in Sweden.

A survey covering HRQoL, health status, personality, fear-avoidance and socio-demographic variables (of which previous and current work status was one) was sent to the 116 former patients together with an information letter and a pre-paid response envelope. Reminder letters and questionnaires were sent one month later, and again after another 3 weeks. The participants could choose a flower check or a lottery ticket,

each worth about 2.5 Euros, as a reward. The study was conducted according to the ethical principles of the Helsinki Declaration and approved by the ethics committee of Uppsala University.

Eighty-six former patients (74.1%) returned the questionnaire booklet. Of these, 51 former patients had been employed at the time of the burn injury. Three patients had retired due to age at the time of the investigation. Thus, there were 48 patients (11 women, 37 men) who could be expected to return to work and they constituted the current sample, while the remaining 38 were excluded. All 48 patients were below the common retirement age of 65 years. Mean age at injury was 40.8 years (SD 10.2, range 20–61 years), and at the time of the investigation it was 44.4 years (SD 10.2, range 23–64 years). Mean time since injury was 3.6 years (SD 1.1, range 1.4–5.6 years). Average burn size was 17.5% TBSA (SD 15.3, range 0.1–80.0%), of which 7.9% (SD 11.2, range 0–48%) were TBSA-FT. TBSA and TBSA-FT were assessed by two experienced burn surgeons who used all available medical records including photographs and the surgeon's notes during the time in care. The average LOS in the Burn Unit was 19.7 days (SD 21.8, range 1–95 days). Forty-three patients had thermal burns, 5 had electrical burns. Twelve burn injuries were occupational, 11 occurred at home, 20 in leisure time, and 4 were self-inflicted. Thirty-one patients had injuries to the face and 39 had injuries to the hands. Twenty-four patients had been on sick leave for less than 6 months and 23 for a longer period. According to the medical records, 7 patients had a history of psychiatric problems such as psychosis, depression, anxiety or substance abuse. Twenty-seven were married, 18 single and 3 were widowed. Nineteen patients had 9 years of formal education and 29 had more than 9 years.

The current subsample differed from the excluded 38 responders in being more likely to be married [$\chi^2 (1) = 5.9, p < 0.05$], to have injuries to the hands [$\chi^2 (1) = 10.9, p < 0.01$] and face [$\chi^2 (1) = 4.3, p < 0.05$], to have employment after the burn [$\chi^2 (1) = 11.7, p < 0.001$], and (not surprisingly) to have had occupational injuries (other causes were merged into one category) [$\chi^2 (1) = 6.1, p < 0.05$]. No other differences were found regarding the above-mentioned burn-specific or socio-demographic data. In comparison with the 30 who did not respond to the survey, the members of the current subsample were less likely to have a record of substance abuse [$\chi^2 (1) = 12.1, p < 0.001$] and more likely to have injuries to the hands [$\chi^2 (1) = 4.2, p < 0.05$]. Data on the nonresponders were restricted to the medical records (age, sex, TBSA, LOS, localization of burn injury, documented psychiatric problems).

Measures

Work status. Information on pre-burn and current work status was gathered in the survey. The respondents were asked about their main activity status described by the alternatives: working, studying, retired due to age, unemployed, sick-listed, disability pension. Only those who responded that they had been working before the burn were considered for the study. Those who were working at the time of the investigation were referred to as group 1 ("working"), and the rest were referred to as group 0 ("non-working").

Predictive variables. Socio-demographic and injury-related variables. Based on the current literature, the following variables were considered relevant and were extracted from the medical records: age, gender, TBSA, TBSA-FT, LOS, localization of burn to the hands or the face, and a documented history of psychiatric illness (including substance abuse). Time since injury was added as a factor that most likely affects the return to work rate. In addition, the survey contained questions about marital status and level of education. The original 3 levels of education were merged into 2 groups, group 0 (0–9 years of education) and group 1 (more than 9 years of education).

The Swedish universities Scales of Personality (SSP) contains 91 items divided into 13 subscales with 7 items in each: (1) Somatic Trait Anxiety, (2) Psychic Trait Anxiety, (3) Stress Susceptibility, (4) Lack of Assertiveness, (5) Detachment, (6) Embitterment, (7) Trait Irritability, (8) Mistrust, (9) Impulsiveness, (10) Adventure Seeking, (11) Social Desirability, (12) Verbal Trait Aggression and (13) Physical Trait

Aggression. The items were rated on a scale from 1 = "Does not apply at all" to 4 = "Applies completely". The alpha values for the subscales ranged from 0.59 to 0.84 (22). The data were adjusted for age. T-scores were calculated for each gender separately, based on the Swedish normative sample (22).

Post-burn variables. The Short-Form 36 Health Survey (SF-36) contains 36 items measuring HRQoL (23). It assesses 8 aspects: Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role-Emotional, and Mental Health. The first 4 subscales form the Physical Composite Scale (PCS) and the last 4 form the Mental Composite Scale (MCS). The Swedish version of the SF-36 has shown adequate reliability, construct and clinical validity (24, 25).

The Burn Specific Health Scale-Brief (BSHS-B) is a questionnaire with 40 items divided into 9 subscales that measure perceived function and well-being: Simple Abilities, Heat Sensitivity, Hand Function, Treatment Regimens, Work, Body Image, Affect, Interpersonal Relationships and Sexuality. The items were rated on a scale from 0 = "All the time/great difficulty" to 4 = "Never/no difficulty". The alpha values ranged from 0.75 to 0.93 (26).

Fear-avoidance was assessed by 4 questions:

1. My burn injury has put my body at risk for the *rest* of my life.
2. I can't do the same things as other people do since there is a too big risk that I might be burn-injured again.
3. I'm afraid that I might get hurt again if I put myself in risky situations.
4. It is really not safe for a person with a condition like mine to be physically active.

Items 1, 2 and 4 were taken from the Tampa Scale of Kinesiophobia (TSK) (27) and adapted to the burn population. The TSK measures fear-avoidance beliefs and fear of (re)injury due to movement. Item 3 was constructed specifically for this sample. The answers were given on a 5-point scale ranging from 0 = "Always applicable" to 4 = "Never applicable", with a higher score indicating a lower degree of fear-avoidance beliefs. In the statistical analysis the scores were reversed, so that a higher score indicates a higher degree of fear-avoidance beliefs. The 4 items had a Cronbach's alpha value of 0.69. The mean score of the 4 items was used in the statistical analyses.

The Impact of Event Scale-Revised (IES-R) was used to assess symptoms of PTSD. It contains 22 items and 3 subscales: Intrusion, Avoidance and Arousal. The items are rated on a 4-grade scale from 0, 1, 3, 5, where 0 = no symptom, and 5 = a high frequency of the symptom. The IES-R has shown good internal consistency and test-retest reliability (28). The IES-R total scores were used in the analyses.

The Hospital Anxiety and Depression Scale (HADS) was used to assess current mood. It consists of 2 subscales, Anxiety and Depression, with 7 items in each (29). The items are rated on a scale from 0 to 3, where 0 = no symptom and 3 = severe symptom. The HADS was developed to study mood in non-psychiatric patient samples and has shown satisfactory reliability and validity (30). The HADS total scores were used in the analyses.

Care contacts and sick leave. Information was gathered regarding care contacts immediately after discharge from the Burn Unit and currently (at the time of investigation). The respondents could choose one or more of the following: primary care facility (general practitioner, district nurse, etc.), surgical clinic, rehabilitation clinic, physiotherapy, occupational therapy, psychiatric clinic, industrial health care service, or other. The question about length of sick leave had seven response categories in the survey. It was subsequently merged into 2 categories, with 6 months of sick leave as the cut-off.

Data analysis

The statistical analyses were logistic regression, Mann-Whitney *U* test, and χ^2 test. Fisher's exact test was applied when the expected number of observations was less than 5 in each cell. Total TBSA, TBSA-FT, and LOS were positively skewed and therefore square root transformed before analysis. To establish a predictive model, logistic regression was used with the variable "returned to work (1/0)" as a dependent dichotomous variable. In step 1, the predictor variables were examined in simple regressions and only those having a *p*-value ≤ 0.10 were included in the multiple models (Table I). In step 2, separate multiple logistic regressions (stepwise forward, conditional) were performed for variables associated with injury severity and for variables associated with individual characteristics. In step 3, a final multiple model was achieved by a stepwise forward procedure for the injury-related and individual variables that remained in step 2.

RESULTS

Post-burn work status

Thirty-three participants (69%) had returned to work (1 = working) while 15 (31%) had not (0 = non-working).

Prediction of post-burn work status

Step 1. The following variables were evaluated in simple logistic regression analyses: age, gender, TBSA, TBSA-FT, LOS, facial burns, hand burns, time since injury, education, marital status, documented history of psychiatric illness, and the 13 SSP subscales (Table I). An evaluation of intercorrelations suggested the exclusion of some burn severity and personality variables. TBSA, TBSA-FT and LOS were highly correlated (range *r* = 0.69–0.78) and therefore only one of them (TBSA-FT) could be included. LOS was excluded on theoretical and statistical grounds, as it can depend on many things other than burn severity, such as administration and availability of home care facilities, and TBSA was excluded as it was marginally weaker statistically. The personality variables with p-values ≤ 0.10 were also intercorrelated (average *r* = 0.51, range 0.22–67). The one with the lowest *p*-value (Embitterment) was chosen first. Subsequently, Adventure Seeking was selected as it had an acceptable intercorrelation (*r* = 0.36) with Embitterment. The remaining variables had intercorrelations above 0.50.

Step 2. The following predictor variables were considered for the initial multiple regression model for injury-related variables: TBSA-FT, extent of Hand burns and Time since injury. Only TBSA-FT (odds ratio 0.48, CI 0.27–0.57) and Time since injury (odds ratio 2.26, CI 1.04–4.93) were significant at the last step (Table II). The following predictor variables were considered for the initial multiple regression model for individual characteristics: Psychiatric history, Stress Susceptibility, Impulsiveness, Adventure Seeking, and Embitterment. Only Embitterment (odds ratio 0.93, CI 0.87–0.99) was statistically significant at the last step (Table II).

Step 3. TBSA-FT (odds ratio 0.44, CI 0.25–0.77), Time since injury (odds ratio 2.81, CI 1.15–6.84) and Embitterment (odds ratio 0.91, CI 0.83–0.99) were considered for the final multiple logistic regression and all 3 were statistically significant at the last step (Table II). All 3 models had adequate fit according to the Hosmer and Lemeshow test (not significant). The final model had the highest effect size and the highest overall classification accuracy (83.3%). The accuracy was better for the group that was working throughout the 3 steps of the analysis.

Table I. *Simple logistic regression analyses with return to work (1/0) as the dependent variable*

Independent variables	Step 1: Simple logistic regressions		
	χ^2	*p*-value	* Incl.
Injury-related			
TBSA	6.3	0.01	a)
TBSA-FT	8.9	0.003	*
LOS	8.7	0.003	a)
Hand burns	2.9	0.09	*
Facial burns	1.4	0.23	
Time since injury	3.5	0.06	*
Socio-demographic			
Age	0.0	0.98	
Gender	0.1	0.75	
Education	1.7	0.19	
Marital status	0.8	0.37	
Psychological			
Psychiatric history	5.0	0.02	*
Somatic Trait Anxiety	0.4	0.52	
Psychic Trait Anxiety	0.6	0.43	
Stress Susceptibility	2.8	0.10	a)
Lack of Assertiveness	0.5	0.47	
Detachment	0.0	0.87	
Embitterment	5.6	0.02	*
Trait Irritability	0.4	0.55	
Mistrust	0.1	0.79	
Impulsiveness	3.7	0.06	a)
Adventure Seeking	2.9	0.09	*
Social Desirability	1.3	0.25	
Verbal Trait Aggression	0.2	0.67	
Physical Trait Aggression	0.7	0.41	

Health-related quality of life

The group that was working scored higher than the group that was not working on the following subscales in the SF-36 Physical Domain: Physical Functioning [$Z = 4.4$, $p < 0.0001$], Role-Physical [$Z = 3.3$, $p < 0.001$], Bodily Pain [$Z = 2.4$, $p < 0.05$], and General Health [$Z = 2.9$, $p < 0.01$]. Consequently, they differed significantly on the Physical Composite Scale [$Z = 3.9$, $p < 0.0001$]. Furthermore, those who were working had higher means on the following subscales in the Mental Domain: Social Functioning [$Z = 2.6$, $p < 0.01$] and Mental Health [$Z = 2.1$, $p < 0.05$]. The groups did not differ regarding Vitality, Role-Emotional, or the Mental Composite Scale (Table III). The means in the group that was working was very close to the normative Swedish means and in some cases they were slightly higher, although all values were within 1 SD of the normative mean. The mean scores of the group that did not work were considerably lower than normative values and 1 SD below the normative means on the subscales Physical Functioning and Role Physical, and the Physical Composite Scale.

Health status

The group of former patients who had returned to work had a better burn-specific health status, as reflected in their scores for the following BSHS-B subscales: Simple Abilities [$Z = 4.3$, $p < 0.0001$], Heat Sensitivity [$Z = 2.5$, $p < 0.05$], Hand Function [$Z = 4.4$, $p < 0.0001$], Treatment Regimens [$Z = 3.6$, $p < 0.001$], Work [$Z = 5.0$, $p < 0.0001$], Affect [$Z = 3.8$, $p < 0.001$], Interpersonal Relationships [$Z = 2.6$, $p < 0.01$] and Sexuality [$Z = 3.3$, $p < 0.01$] (Table IV). The groups did not differ regarding Body Image. Furthermore, those who were working expressed less fear-avoidance beliefs [$Z = 3.2$, $p < 0.01$] and lower total scores on the IES-R [$Z = 2.4$, $p < 0.05$], signifying fewer symptoms of PTSD. There was no difference between groups with regard to HADS scores.

Care contacts and sick leave

Those who were employed at the time of the study had had less contact with a surgical clinic [$\chi^2 (1) = 3.9$, $p < 0.05$], a psychiatric clinic [$\chi^2 (1) = 11.2$, $p < 0.01$] and a physiotherapist [$\chi^2 (1) = 7.8$, $p < 0.01$] directly after the injury. Currently, they were less likely to have contact with a rehabilitation clinic [$\chi^2 (1) = 8.7$, $p < 0.01$] and an occupational therapist [$\chi^2 (1) = 6.2$, $p < 0.05$]. In addition, they were more likely to have had a period of sick leave that was shorter than 6 months [$\chi^2 (1) = 15.4$, $p < 0.0001$]. In fact, only one of those who had not returned to work had had less than 6 months of sick leave, and 14 had had a longer absence.

DISCUSSION

This investigation suggests that predictors of working status after burn injury are both burn-related and personality-related. Compared with those who were working, those who were not working had considerably lower HRQoL, more care contacts and longer sick leave, poorer burn-specific health status, more dysfunctional beliefs, and more symptoms of PTSD, but they were no different regarding symptoms of general anxiety and depression.

The final predictive model was adequate with respect to effect size and classification accuracy. The classification accuracy was especially high for those who had returned to work. Longer time since injury was associated with a higher likelihood of returning to work, while a greater extent of full-thickness injuries was associated with a lower likelihood of returning to work. These were the strongest available predictors in this material, as can be seen in their respective odds ratios (2.81 for time and 0.44 for TBSA-FT). The association between TBSA-FT and return to work is supported by previous research (12). In addition, likelihood of returning to work was significantly impeded by high scores for the personality trait Embitterment (odds ratio 0.91). The subscale Embitterment contains statements such as ''I have had my fair share of troubles in life'', ''I have often got into trouble even when it was not my fault'', ''It looks as if I will never get the chance to get anywhere in life'', and ''There have been times when I

Table II. *Steps 2 and 3 of the logistic regressions with return to work (1/0) as the dependent variable*

Independent variables	* Incl	Effect size[a]	Wald	*p*-value	Odds ratio	CI	Classification Percentage correct RTW = 1	RTW = 0	Overall
Step 2: Stepwise logistic regression (forward selection)									
Injury-related variables									
Model characteristics		0.447					90.9	53.3	79.2
TBSA-FT	*		9.27	0.002	0.48	0.27–0.75			
Time since injury	*		4.22	0.040	2.26	1.04–4.93			
Hand burns				0.154					
Psychological variables									
Model characteristics		0.184					93.9	40.0	77.1
Embitterment	*		5.55	0.018	0.93	0.87–0.99			
Psychiatric history				0.097					
Adventure Seeking				0.274					
Final model	Step 3: Stepwise logistic regression (forward selection)								
Model characteristics		0.575					90.9	66.7	83.3
TBSA-FT			8.20	0.004	0.44	0.25–0.77			
Time since injury			5.17	0.023	2.81	1.15–6.84			
Embitterment			4.79	0.029	0.91	0.83–0.99			

CI: Confidence Interval, TBSA-FT: Total Body Surface Area burned – Full Thickness, RTW: return to work (1 denotes the group that was working, 0 denotes the group that was not working).
[a]Denotes Nagelkerke's R^2.
*Incl.: considered for inclusion in the next step.

was jealous of the good fortunes of others''. The items assess discontent with how life has turned out and feelings of injustice. A personality disposition characterized by Embitterment may be a possible risk factor in adjustment after burn injury.

In group analyses, the group that was working had higher scores than the group that was not working for all physical aspects of HRQoL (SF-36), and for 2 out of the 4 mental health aspects. The results imply that there are differences in both physical and mental domains 1–6 years after the burn injury, and that the differences in the physical health domain are more pronounced. This seems logical, from the fact that the physical ''predictor'' TBSA-FT was a stronger factor in the logistic regression than the personality variable. However, the finding is difficult to interpret as there have been no previously published investigations into this matter. Earlier studies have had shorter time to follow-up (31), have not evaluated return to work in relation to the SF-36 (8, 31, 32), or have focused

on comparing patients with thermal injuries with those with electrical injuries, which results in a sample with narrow ranges of TBSA (0–13%) and only a period of weeks until return to work (0.5–4.5) (33). An alternative explanation for the discrepancy between physical and psychological domains could be that the mental health items on the SF-36 do not adequately correspond to the psychological issues of burn-injured patients at this time point after the injury. The SF-36 is moderately associated with general psychological symptoms (34) and cannot be expected to reveal specific concerns. In support of this interpretation, significant differences between the groups were found using trauma- and burn-specific instruments but not by using a general anxiety and depression instrument (i.e. the HADS). For example, those who were working perceived their health as better on 3 of the BSHS-B subscales that can be judged as mainly psychological and social in content (Affect, Interpersonal Relationships and Sexuality). Moreover,

Table III. *Comparisons between the group that was working (RTW = 1) and the group that was not working (RTW = 0) regarding quality of life*

SF-36	Normative data (23) Mean	SD	RTW = 1 Mean	SD	RTW = 0 Mean	SD	Mann-Whitney *U* test (tied) z-value	*p*-value
Physical functioning	87.9	19.6	91.7	11.9	55.6 †	26.3	4.4	< 0.0001
Role-Physical	83.2	31.8	88.6	21.7	50.0 †	41.6	3.3	< 0.001
Bodily pain	74.8	26.1	82.0	22.9	62.3	26.5	2.4	< 0.05
General health	75.8	22.2	78.0	19.0	57.6	20.9	2.9	< 0.01
Vitality	68.8	22.8	66.4	24.1	54.3	23.8	1.6	ns
Social functioning	88.6	20.3	88.3	18.5	69.2	26.7	2.6	< 0.01
Role-Emotional	85.7	29.2	80.8	37.3	64.4	46.2	1.2	ns
Mental health	80.9	18.9	79.2	18.8	64.0	24.0	2.1	< 0.05
PCS	50.3	9.4	53.2	7.2	39.6†	9.5	3.9	< 0.0001
MCS	50.1	10.1	47.5	13.0	44.2	13.8	0.9	ns

SF-36: Short Form-36, PCS: Physical Composite Scale; MCS: Mental Composite Scale, SD: Standard Deviation, RTW: return to work, ns: not significant. †One standard deviation below normative mean.

Table IV. *Comparisons between the group that was working (RTW = 1) and the group that was not working (RTW = 0) groups regarding post-burn health and dysfunctional beliefs*

	RTW = 1		RTW = 0		Mann-Whitney U test (tied)	
	Mean	SD	Mean	SD	z-value	p-value
BSHS-B[a]						
Simple Abilities	3.8	0.7	2.7	1.3	4.3	< 0.0001
Heat Sensitivity	2.3	1.2	1.3	0.9	2.5	< 0.05
Hand Function	3.9	0.3	2.3	1.5	4.4	< 0.0001
Treatment Regimens	3.4	0.8	2.2	1.1	3.6	< 0.001
Work	3.3	1.0	0.5	1.1	5.0	< 0.0001
Body Image	2.8	1.1	2.1	1.0	1.9	ns
Affect	3.6	0.5	2.5	1.0	3.8	< 0.001
Interpersonal Relationships	3.8	0.5	3.5	0.7	2.6	< 0.01
Sexuality	3.8	0.4	3.1	0.9	3.3	< 0.01
Fear-avoidance	0.8	0.9	1.9	1.1	3.2	< 0.01
IES-R Total score	21.4	20.2	40.3	27.4	2.4	< 0.05
HADS Total score	9.4	5.9	11.9	6.8	1.2	ns

BSHS-B: Burn Specific Health Scale-Brief, IES-R: Impact of Event Scale Revised, HADS: Hospital Anxiety and Depression Scale, SD: Standard Deviation, RTW: return to work

[a]Higher scores denote better perceived health status.

those who were not working expressed more fear-avoidance and symptoms of PTSD, both of which are trauma-related. This finding is of relevance to researchers and clinicians when choosing methods for assessment. Established general outcome measures such as the SF-36 may have to be accompanied by more specific measures that target sample specific concerns.

The differences regarding fear-avoidance and PTSD symptoms suggest that there are fear- and anxiety-related concerns in the group that was not working. Considering the devastating effects of fear-avoidance beliefs on health and functioning of other patient groups (18), these issues should become a focus of attention in rehabilitation facilities. In an interdisciplinary treatment programme, it was shown that a reduction in work-specific fears was of greater importance regarding improved physical working capacity than changes in fear of physical activity (35).

In the present study, the scores of the subgroup of non-working participants were clearly below the normative means for the SF-36 subscales Physical Functioning, Role-Physical and the Physical Composite Scale. These individuals also had lower scores than the normative group for the remaining subscales, but the differences were within 1 SD of the normative means. The former burn patients who had returned to work did not deviate from the normative values in HRQoL. This might be expected, since the selection of participants was based on a presumed fair to good level of functioning – in that all eligible participants were employed before the burn. Normal values in an unselected burn patient sample (not just working participants) have been seen in a previous investigation 2–10 years after burn injury (8). Furthermore, Anzarut et al. (32) recently found that burn patients who had been injured 2–20 years previously had lower scores than a normative sample on only 2 subscales in the SF-36 (Role Physical and General Health).

One weakness of the study is the small sample size. However, the response rate was satisfactory and was even high in

comparison with several previous studies on return to work in burn patients, which were hampered by large attrition rates or inability to locate former patients (12, 13, 33). Another limitation is that we did not have access to information about the patients' occupations and specific work places. Differences in job availability, and possibilities for adjustments at the workplace and for changes in work routines are factors that may have a further impact on the likelihood of returning to work.

In conclusion, the likelihood of returning to work after severe burn injury was associated with longer time since injury, smaller size of full-thickness burns, and less of the personality trait Embitterment. Those who were working expressed significantly better HRQoL, physical health and psychological health than those who were not working. Psychological concerns were better revealed with trauma-related questionnaires than with general questionnaires, which suggests that sample-specific instruments are an important adjunct to more general measures.

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