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## Social Participation of Burn Survivors and the General Population in Work and Employment: A Life Impact Burn Recovery Evaluation (LIBRE) Profile Study

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### Abstract

**Introduction:** Work integration and retention after burn injury is a key outcome. Little is known about how burn survivors reintegrate into the workplace. This article compares scores on the Life Impact Burn Recovery Evaluation (LIBRE) Profile, a burn-specific measure of social participation, between burn survivors and general population samples, focusing on the Work and Employment domain.

**Methods:** Convenience samples of burn survivors and the U.S. population were obtained. Differences in demographic and clinical characteristics and LIBRE Profile scores were assessed. To examine work and employment, we compared family and friends, social activities, and social interactions scores among working vs nonworking burn survivors.

**Results:** Six hundred and one burn survivors (320 employed) and 2000 U.S. residents (1101 employed) were surveyed. The mean age ( $P = .06$ ), distributions of sex ( $P = .35$ ), and Hispanic ethnicity ( $P = .07$ ) did not differ significantly. Distributions of race ( $P < .01$ ) and education ( $P = .01$ ) differed significantly. The burn survivor sample had higher scores, demonstrating higher participation, for work and employment (mean = 49.5,  $SD = 9.42$ ) than the general sample (mean = 46.94,  $SD = 8.94$ ;  $P < .0001$ ), which persisted after adjusting for demographic characteristics. Scores on the three domains administered to all respondents were higher ( $P < .001$ ) for working than nonworking burn survivors.

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#### SUPPLEMENTARY DATA

Supplementary data are available at *Journal of Burn Care & Research* online.

**Conclusion:** Distributions indicated higher social participation in the burn survivor sample than the general sample. Possible explanations include sample bias; resilience, posttraumatic growth, or response-shift of survivors; and limitations of using items in the general sample. Working burn survivors scored higher than those not working. Future work can explore factors that mediate higher scores and develop interventions.

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## INTRODUCTION

People with disabilities and various conditions experience a variety of impacts on their health, including their ability to fulfill mental, physical, social, and environmental roles at work.<sup>1</sup> Between 15% and 58% of people with disabilities who work have trouble completing physical, psychosocial, or environment work tasks.<sup>2</sup> Employment is associated with quality of life<sup>3</sup> and employment and income are associated with life satisfaction.<sup>4</sup> One group of patients in particular who frequently have difficulty returning to work after injury are burn survivors, with one third of this population not returning to work following injury.<sup>5,6</sup> Therefore, work integration and retention after a burn injury becomes an essential outcome measure of successful recovery.

Working capacity is often seen as a proxy of social reintegration in a variety of areas because it links with health and function.<sup>7</sup> Both psychological and social factors, such as pain, neurologic, and psychologic impairments, may explain why 30% of those with burns do not return to their previous jobs.<sup>6</sup> Predictors such as age and level of preinjury job satisfaction also explain a large amount of the variability in the likelihood of work reintegration and retention.<sup>8</sup> One strategy reported to increase return to work (RTW) includes interventions aimed at creating more accepting and tolerant physical and social environments.<sup>9–11</sup> The literature also identifies job conditions, physical accommodations, and participation in outpatient rehabilitation programs as key social environmental predictors of RTW.<sup>5,7,12–14</sup>

The process of returning to work may take weeks, months, or even years for burn survivors<sup>15</sup> and those who do return to work may face challenges reintegrating into the work environment.<sup>5,6</sup> Timing of return to work for burn survivors varies, and people burned at work were less likely to return to work within a year of injury than those burned outside of work.<sup>16</sup> The highest percentage of those burned at work reported that they could not return due to pain and neurologic problems.<sup>16</sup> One study suggested that individuals who were burned at work reported feeling limited in their abilities to work and felt fear at the thought of returning.<sup>17</sup> Another study reported that pain, mobility impairments, and neurologic and psychiatric issues were frequent obstacles to returning to work, while factors associated with return to work included length of hospital stay, inpatient rehabilitation, electrical burn injury, and injury in the workplace.<sup>12</sup> Despite the robust literature in RTW, little is known about how persons with burn injury (PWBI) reintegrate into the workplace and retain employment once back at work.

Given that treatment outcomes, particularly survival and physical function, for burn injury have advanced greatly in recent decades, increasing numbers of burn survivors,<sup>18</sup> more individuals now require tools for needs beyond physical recovery.<sup>6,19,20</sup> However, until recently no comprehensive metric existed to track the social recovery of burn survivors.<sup>21</sup>

Established measures about work lack information about the needs of burn survivors related to issues such as pain, fatigue, amputations, contracture, and scarring,<sup>22</sup> while established measures for burn survivors address more general questions related to quality of life.<sup>22</sup> Social barriers may include challenges dealing with others' perceptions and one's own behavior in social situations both outside and inside the workplace, triggering episodes of social inhibition and decrements in social skills. According to Jain et al.,<sup>23</sup> the most frequently reported problem for PWBI is difficulty and anxiety in social situations which was found to be related to depth of burns. A study found that social support from friends and peers who might be in the workplace was significantly related to several outcomes, such as life satisfaction, self-esteem, and participation in social and recreational activities.<sup>24</sup>

This article compares the Life Impact Burn Recovery Evaluation (LIBRE) Profile, a well-established item response theory (IRT)-based CAT (Computerized Adaptive Test) assessment with strong psychometric properties for six domains, to the scores from a general U.S. sample with a focus on the Work and Employment domain. This burn specific measure of social participation is important for *needs* assessment, tracking program outcomes, and individual monitoring of the recovery process. Scores allow for comparisons of social participation outcomes between a convenience sample of burn survivors and a convenience sample from the overall U.S. population. We hypothesized lower scores on work and employment for burn survivors compared with the general population, based on literature reflecting the challenges faced by burn survivors in reintegrating back into the work place.

## METHODS

### LIBRE Profile

The LIBRE Profile has six domains: Relationships with family and friends, social activities, social interactions, work and employment, romantic relationships, and sexual relationships. The instrument has strong psychometric properties documented in its development.<sup>22</sup> Additional details about other Computerized Adaptive Test (CAT) development methodology have been published previously.<sup>21,25,26</sup>

### Short Form Generation

Six hundred and one burn survivors responded to the full item bank of questions for the LIBRE Profile and these data were used to calibrate the CAT.<sup>22</sup> Inclusion criteria included being 18 years of age or older; having a burn that was at least 5% total body surface area (TBSA) and/or burns to one of the four critical areas (face, hands, feet, genitals); living in the United States or Canada; and having the ability to read and understand English. Subjects were recruited via various methods, including from the Phoenix Society for Burn Survivors, hospital burn units across the United States and Canada associated with the LIBRE Clinical Advisory Board, from the LIBRE Project's contact list, and by word of mouth.<sup>22</sup> Short forms for use by the general sample were then developed to cover the six LIBRE Profile domains. A range from 6 to 11 items from each scale's full item bank (57 total short form items) were selected for inclusion in the fixed short forms based upon the item parameters of discrimination and average difficulty.<sup>26</sup> For the Work and Employment domain, 10 items were selected. The reliability and validity of the short forms was demonstrated by comparing

the scores of a sample of burn survivors on the LIBRE Profile short forms with scores on legacy measures as well as a repeat administration of the short forms themselves.<sup>27</sup>

### Sampling Methods and Data Collection

A general (normative) sample was obtained through the YouGov survey research firm (Palo Alto, CA) panel using sample matching. Samples representative of a study-appropriate target population are constructed from large (over 1 million respondents) but unrepresentative pools of U.S. adult opt-in survey respondents aged 18–85 (Rivers 2006).<sup>28</sup> Participants were screened for three characteristics: 1) currently employed, 2) currently in a romantic relationship, and 3) currently sexually active.

All participants were administered three LIBRE Profile scales: Relationships with family and friends, social interactions, and social activities. Participants were administered the scales for work and employment, romantic relationships, or sexual relationships if they indicated that the screened characteristic was relevant to their current circumstances. To characterize the overall health of the sample, participants were administered the VR-12, a well-established generic measure of health providing physical and mental summaries that are standardized to a mean of 50 and standard deviation of 10 based upon a general U.S. population.<sup>29–31</sup> Questions were administered online by YouGov and the study authors received a coded data set for analysis.

### Analysis

Differences in means (for age) and proportions (for sex, race, Hispanic ethnicity, and education) between the general sample and burn survivor sample were assessed for statistical significance using an unpaired two sample *t* test for age and chi-squared tests for categorical variables. These characteristics were compared among the working and nonworking groups of the general and burn survivor samples.

We conducted a confirmatory factor analysis (CFA) to examine whether the unidimensional structure held for each individual domain. We determined acceptable model fit as root mean square error of approximation (RMSEA) 0.1, Confirmatory Fit Index (CFI) and Tucker-Lewis Index (TLI) 0.9. To improve the model fit, we examined the residual correlation matrix and sequentially removed the items with higher residual correlation values with other items.

We calibrated the items that emerged from the CFA using the graded response model (GRM). Because GRM was the model used in calibrating the item bank for burn survivors, we used the same model in the general population sample to facilitate the following linking process. We examined the item fit by examining the difference in observed and expected number of respondents in each category at the summed score level using Pearson's chi-square ( $s-\chi^2$  [sum of squares chi-squared] statistics) test. Misfit items were identified using the Bonferroni corrected *P* value. If the item was identified as a misfit, we visually examined the item fit by comparing whether at each summed score level the observed percentage of respondents in each category fell into the 95% confidence intervals (CIs) of the estimated expected percentage of respondents in that category. The 95% CIs of the expected percentage of respondents were estimated using the normal approximation method.

If the observed percentage is beyond the upper/lower limit of 95% CIs, that means the model under-/over- predicts the observed percentages.

We applied the nonequivalent group common-item design to link the burn survivor sample scale to the general population sample scale, since the short-form items were the common items across the two samples. The burn survivor sample and general population sample are likely to be different; the common items' parameters based on these two samples would be different. Linking is the process of using common items as anchors to transform the scores from one sample to another sample. Since we had already calibrated the item parameters in the burn survivor sample, we applied separate calibration<sup>32</sup> and followed the Stocking-Lord method to estimate the linking coefficients and transformed the general population sample metric to the burn survivor sample metric.<sup>33</sup> The LIBRE Profile standard scores were transformed to a T-score distribution where the mean = 50,  $SD = 10$  based upon the distribution of the general sample. Higher scores correspond to better performance on the scale. LIBRE Profile scores were compared between the burn survivor and general population samples. In addition, LIBRE Profile scores for the three LIBRE Profile domains administered to all respondents (family and friends, social activities, and social interactions) were compared between the working and nonworking burn survivor sample.

## RESULTS

YouGov administered the survey to 2000 U.S. residents who were sampled. In response to screening questions, 1101 participants indicated that they were employed, 1242 that they were in a romantic relationship, and 1147 that they were in a sexual relationship. The mean age of the general sample was 47.35 ( $\pm 16.34$ ) (range 19–86) (Table 1). The mean age ( $P = .06$ ) and distributions of sex ( $P = .35$ ) and Hispanic ethnicity ( $P = .07$ ) of the general sample did not differ in a statistically significant manner from the burn survivor sample (Table 1). There were significant differences in the distribution of race ( $P < .01$ ) and education ( $P = .01$ ). The mean VR-12 scores for the general sample were physical component summary score of 46.13 (10.88) and mental component score of 47.35 (11.78), both below the national average of 50 by about 0.37  $SDs$  for the physical and 0.26  $SDs$  for the mental which are small effect sizes.

In comparing the working segment of the general sample to the working segment of the burn survivor sample, the mean age and distributions of ethnicity and education did not differ significantly (Table 1). The working burn survivor sample had a higher proportion of women (57.2%) than the working general sample (50.2%) ( $P = 0.03$ ), and there were significant differences in the distribution of race (working burn survivor sample 80.3% white, 6.3% black/African American, 13.4% other; working general sample 73.2% white, 11.5% black/African American, 15.3% other;  $P = 0.01$ ) and marital status (burn survivor working sample 47.5% married/live with significant other, 14.3% divorced/separated or widowed, 37.5% single, 0.63% missing; general working sample 55.4% married/domestic partner, 13.6% separated/divorced/widowed, 31.1% single;  $P < .05$ ).

For the Work and Employment scale, the distribution indicates higher scores ( $P < .0001$  by two group  $t$ -test) (higher social participation) for the burn survivor sample (mean = 49.5,

$SD = 9.42$ ) compared with the general sample (mean = 46.94,  $SD = 8.94$ ; Supplementary Appendix). This difference would be considered a small effect size according to Cohen (2).<sup>34</sup> After adjusting for demographic differences between the working burn survivor and general population samples, the mean score of the burn survivor sample remained higher than the mean of the general population sample (least square means [ $SD$ ] of 48.16 [0.73] and 45.68 [0.57], respectively,  $P < .0001$ ).

Among the burn survivor sample, scores on the three LIBRE Profile domains administered to all respondents were higher ( $P < .001$ ) for the working segment than the nonworking segment. For the working segment, scores on these domains were: family and friends (mean = 52.49,  $SD = 10.25$ ), social activities (mean = 55.62,  $SD = 9.42$ ), and social interactions (mean = 48.81,  $SD = 9.51$ ). For the nonworking segment, scores on these domains were: family and friends (mean = 49.02,  $SD = 10.38$ ), social activities (mean = 48.52,  $SD = 10.13$ ), and social interactions (mean = 45.66,  $SD = 10.08$ ; Table 2). These differences range from a small (2) to medium (5) effect size.<sup>34</sup>

In the process of calibrating the items for the Work and Employment scale, one item (“Please specify your level of agreement: My boss feels I can do my work”) was removed. For the remaining 10 items, the confirmatory factory analysis indicated acceptable model fit (CFI = 0.962, TLI = 0.951, RMSEA = 0.095; Table 3). Items were assessed for differential item function (DIF), in which respondents with similar overall ability tend to respond differently to a particular item in a manner associated with a particular variable or demographic characteristic. One item (“Please specify your level of agreement: I work well with coworkers”) was identified as having DIF based on the IRT method but no items were identified as having DIF based on the logistic regression method, so no items were removed (Table 4). CFA results for the remaining domains can be found in the Supplementary Appendix.

As part of the calibration process, the LIBRE Profile domains were assessed for misfit items. In each scale, there are substantial numbers of misfit items. In work and employment, 8 out of 10 items were misfit. Analysis of misfit in the Work and Employment scale suggests that some of the misfit items may be attributable to the response option “neither agree nor disagree.” There are a few significant differences in predicted percentage and observed percentage for the “strongly agree,” “agree,” and “strongly disagree” response options. For the “neither agree nor disagree” response option, at summed score 19, substantially more respondents (72%) selected this option than the model prediction (26%). We found this pattern (higher observed percentage at certain summed scores level for the “neither agree nor disagree” response option) in 8 of 10 items in the Work and Employment scale (the remaining seven items are displayed in Supplementary Appendix Figure A2); for the remaining two items we could not conduct this comparison because the “neither agree nor disagree” response option was merged with another response option.

For the Romantic Relationships scale, distributions suggest a trend of overlap between general and burn survivor sample scores (histogram for Romantic Relationships Scale shown in Supplementary Appendix). For the remaining four scales, linkage between the burn survivor sample and the general sample was not sufficient to permit direct comparisons.



Items were calibrated previously based on a burn survivor sample. Some items within a domain did not fit a unidimensional scale in the general population sample, meaning they measured more than one underlying construct. Some items had stronger co-dependence (correlation) in the general population sample and were therefore removed.

## DISCUSSION

The general and burn survivor samples had similar characteristics. The burn survivor convenience sample had higher scores than the general sample on the Work and Employment scale, indicating higher social participation. Importantly, among the burn survivor sample, the working segment had higher scores than the nonworking segment on the three LIBRE Profile domains administered to all respondents (relationships with family and friends, social activities, and social interactions).

A possible explanation for the unexpectedly high scores of the burn survivor sample compared with the general sample is sample bias. The working segments of the two samples differed significantly, with a higher proportion of women in the working burn survivor sample and differences in the distributions of sex, race, and marital status, though they did not differ significantly in mean age or distribution of ethnicity and education. Mean scores on the Work and Employment scale remained higher for the burn survivor sample than the general sample after adjusting for demographic differences. Notably, a recent study found that individuals burned at work scored lower on the work and employment domain than those injured elsewhere after adjusting for clinical and demographic differences.<sup>17</sup> While the general sample was taken from a large but unrepresentative pool, it was then matched to the U.S. adult population and found to be varied in demographic characteristics. However, individuals who opt in to online surveys may differ from the rest of the general population. In addition, characteristics associated with employment may vary between the general and burn survivor populations.

The burn survivor group is a convenience sample recruited largely through burn clinics and advocacy groups. This sample may benefit from greater levels of social support than the burn survivor population as a whole, given that these individuals have received at least some supportive care following their injuries. Patients at burn clinics and those involved with burn advocacy groups had increased access to physical as well as mental health care. It is also possible that burn survivors may exhibit greater social participation due to social support, or due to other factors such as resilience, defined as returning to or approaching the state an individual was in before injury, or posttraumatic growth.<sup>35</sup> Posttraumatic growth may involve surpassing the preinjury state in terms of “personal strength, reprioritizing, spirituality, humanity, changed relationships, and compassion and altruism.”<sup>36</sup> Limited research has been conducted in this area among burn survivors and it is unclear which factors lead to increased resilience or posttraumatic growth. Some studies suggest that this type of recovery is associated with intrinsic personality traits, such as neuroticism (associated with poor adjustment),<sup>37</sup> or characteristics of injury, such as severity (associated with positive adjustment).<sup>38</sup> Other research suggests the involvement of potentially malleable traits, such as optimism, which could serve as targets for future interventions.<sup>35</sup>

Burn survivors may also experience “response shift,” a change in self-reported well-being over time that results from an altered perspective of the individual over time rather than an altered state of health.<sup>39,40</sup> One review found that individuals with chronic illness may self-report quality of life “equal or superior to less severely ill or healthy people.”<sup>41</sup> Possible explanations for such a shift may include changes in an individual’s standards, changes in the meaning an individual assigns to a measure, and changes in priorities.<sup>39,41,42</sup>

In addition, burn survivors were asked to answer questions in the context of their burns, while the general sample received no analogous prompt. Such cues may prime respondents to reframe their perspective on subsequent questions. For example, a study in patients at a trauma center with musculoskeletal illness found that priming with positive items was associated with higher scores on subsequently administered patient-recorded outcome items.<sup>43</sup> A study of VA patients with chronic lung disease, chronic low back pain, and osteoarthritis of the knee suggested that individuals can distinguish physical challenges attributable to a condition from those attributable to other factors.<sup>44</sup>

The high scores of the burn survivor sample in this study demonstrate the potential for a strong social recovery following burn injury. Future work may consider other populations of burn survivors, including those who have not yet benefited from community resources. As discussed above, it may take weeks or months following injury before burn survivors return to employment and as many as one third of those injured do not go back to work. Further research can examine whether interventions at the individual and environmental level, such as counseling, peer-support, and workplace accommodations, are associated with likelihood of returning to work and with social participation in the workplace. In addition, future work can explore workplace reintegration and retention in other countries with different retirement ages, public assistance systems, and cultural perceptions surrounding work, disability, and identity. Research has found that important predictors of RTW and workplace retention include: positive change in job title or function, use of accommodations, and additional infrastructure to respond to PWBI’s new needs. Furthermore, modified work tasks and flexible working hours are positive predictors of RTW.<sup>7</sup> Interestingly, such changes are not necessarily resource-intensive and often straightforward to implement.<sup>5,7,12</sup>

Significantly higher scores by the working as compared with nonworking burn survivor sample highlight the association between high social participation in employment and other areas and underscore the importance of efforts to facilitate work reintegration and retention.

Misfit around response option 3 (“neither agree nor disagree”) may be explained by the specificity of the items. Previous work has identified challenges in converting between disease-specific and general measures of quality of life<sup>45</sup> and suggests that condition-specific measures may serve a different or complementary purpose.<sup>46,47</sup> With explicitly burn-specific items removed from the scales, we hypothesize that questions may be perceived differently by the general sample than by the burn survivor sample; for example, it is possible that these questions are less relevant or compelling to the general sample, leading to higher rates of response option three. Future work in this area may contribute to the understanding of the properties’ condition-specific as opposed to generic measures.



Comparisons of general population scores to scores of individuals with a condition have been used previously in burn-specific populations. In the Burn Outcomes Questionnaire (BOQ) for pediatric patients age 0 to 4, burn survivor scores are compared to general population scores.<sup>48</sup> Later in the 48-month model, recovery curves for family function and emotional behavior indicate significantly higher scores (better function) for burn survivors as compared with the unburned population, although burn survivors experienced poorer outcomes over time than the general population in other areas such as gross motor skills and play. Other studies found that psychological outcomes improved more slowly than physical ones in burn survivors<sup>49</sup> and that psychological outcomes were lower than those of the general population one and a half years after burn injury.<sup>50</sup>

Four of the LIBRE Profile scales did not link between the burn survivor sample and the general sample. Possible explanations include that the underlying constructs were perceived differently in the two populations or that items were interpreted differently. Future work can further explore the reasons for these differences. This emphasizes the importance of condition-specific measures with items developed specifically according to the interpretation and understanding of individuals with the condition. In some cases, items developed and calibrated for a general population may be interpreted differently by individuals with a particular condition.

Limitations of this study include that less than a third of the burn survivors in the sample were within 3 years of injury, and time further out from the burn injury may be associated with improved quality of life.<sup>49,51</sup> Scores from the general sample could be affected by the removal of burn-specific items from the scales. The large size of the general sample could also contribute to greater  $\chi^2$  values, possibly leading to significant *P* values even if effect sizes are small. There is a potential for sample bias as discussed above, including that the convenience sample of burn survivors may be likely to receive a higher degree of social support and may experience phenomena including resilience, posttraumatic growth, and response shift, which influence perspectives and self-reported outcomes.

There is little research to date on the impact of burn injury on long-term career trajectories, in addition to the impact on RTW and work reintegration. A study of soldiers and Marines injured in combat, which examined the effects of “discontinuous career changes” resulting from a traumatic occurrence, noted that the former career may be tightly tied to the individual’s identity. It suggested that helpful approaches emphasize future opportunities to derive meaning from work and use competencies from previous work rather than past trauma or current challenges.<sup>52</sup> Future research can examine the extent to which young people with a burn injury may choose or be forced into alternate career paths as a result of their injury and how this shapes their integration into the work place and overall social participation and quality of life.

## CONCLUSION

Overall, the comparison of burn survivor scores and general sample scores further supports the importance of using a condition-specific measure. Distributions indicated higher levels of social participation in the Work and Employment domain in the burn survivor sample

than the general sample. Possible explanations for this unexpected result include bias in sampling for either population; resilience or posttraumatic growth of burn survivors who have rebounded or progressed following their injury; response shift of burn survivors who have adapted their worldview as a result of their injury; and limitations of using nonburn-specific items in the general sample. Importantly, working burn survivors scored higher than nonworking burn survivors on the three LIBRE Profile domains administered to all respondents (family and friends, social activities, and social interactions). All of these differences suggest potential avenues for research. For example, a future investigation could explore what factors mediate higher social participation scores in the Work and Employment domain for the burn survivor sample, and what factors mediate higher scores among working burn survivors compared with nonworking burn survivors on the three domains of the LIBRE Profile administered to all respondents. These may include internal factors that could be addressed via resources such as treatments or peer support as well as environmental factors that could be addressed through avenues such as workplace accommodations. Perhaps interventions could be developed to target these factors in order to achieve desired levels of social participation. Such interventions could be beneficial to survivors of burns or individuals with other injuries or illnesses that can impact social participation.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1.**

Sample characteristics

Characteristic	General Sample (n = 1011, Working Sample)		General Sample (n = 989, Nonworking Sample)		Burn Survivor Sample (n = 320, Working Sample)		Burn Survivor Sample (n = 281, Nonworking Sample)		P (Compare Two Working Samples)
	N	%	N	%	N	%	N	%	
Age, mean ± SD	Mean (SD), (25%, 50%, 75%) 42.66 (13.39) (31, 42, 54)		Mean (SD), (25%, 50%, 75%) 50.12 (18.13) (34, 53, 65)		Mean (SD), (25%, 50%, 75%) 41.75 (14.36) (29, 42, 53)		Mean (SD), (25%, 50%, 75%) 47.73 (17.11) (32, 50, 60)		.2989
Sex									
Women	507	50.15	615	62.18	183	57.19	134	47.69	
Men	504	49.85	374	37.82	137	41.81	146	51.96	.0292*
Missing	0	0	0	0	0	0	1	0.36	
Race									
White	740	73.19	686	69.36	257	80.31	209	74.38	
Black/African American	116	11.47	112	11.32	20	6.25	36	12.81	
Other	155	15.33	191	19.32	43	13.44	35	12.46	.0128*
Missing	0	0	0	0	0	0	1	0.36	
Hispanic ethnicity									
Yes	97	9.59	123	12.44	21	6.56	20	7.12	
No	914	90.41	866	87.83	299	93.44	260	92.53	.1137
Missing	0	0	0	0	0	0	1	0.36	
Education									
Less than high school	28	2.77	87	8.61	4	1.25	13	4.63	
High school/GED	318	31.45	431	42.63	98	30.63	133	47.33	
Greater than high school	665	65.78	471	46.59	215	67.19	134	47.69	.2935
Missing	0	0	0	0	3	0.94	1	0.36	
Time since burn injury, mean ± SD									
<3 years	-	-	-	-	71	22.19	85	30.25	
3–10 years	-	-	-	-	88	27.50	78	27.76	
>10 years	-	-	-	-	161	50.31	118	41.99	
TBSA, mean ± SD	-	-	-	-	37.26 (22.74)		44.14 (24.18)		



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Characteristic	General Sample (n = 1011, Working Sample)		General Sample (n = 989, Nonworking Sample)		Burn Survivor Sample (n = 320, Working Sample)		Burn Survivor Sample (n = 281, Nonworking Sample)		P (Compare Two Working Samples)
	N	%	N	%	N	%	N	%	
VR-12, mean ± SD									
PCS	49.06 (8.68)		42.46 (12.58)		-	-	-	-	-
MCS	47.69 (11.35)		46.05 (13)		-	-	-	-	-
Marital status									
Married/domestic partner	560	55.39	522	52.78	Married/live with significant other: 152	47.5	Married/live with significant other: 118	41.99	
Separated/divorced/widowed	137	13.55	209	21.13	Divorce/separated or widowed:46	14.3	Divorce/separated or widowed:58	20.64	
Single	314	31.06	258	26.09	Single:120 Missing:2	37.5	Single:104 Missing:1	37.01	.0485*
Employment									
Full-time	762	75.37	0	0	Working: 310	96.69	Working: 12	4.27	
Part-time	249	24.63	0	0	Not working: 4	1.25	Not working: 188	66.9	
Temporary laid off	0	0	8	0.81	homemaker/caregiver:1	0.31	homemaker/caregiver:15	5.34	
Unemployed	0	0	155	15.67	Volunteer:2	0.63	Volunteer:19	6.76	
Retired	0	0	342	34.58	Retired:1	0.31	Retired:45	16.01	
Permanently disabled	0	0	170	17.19	Missing: 2	0.63	Others:1	0.36	
Homemaker	0	0	188	19.01			Missing: 1	0.36	
Student	0	0	91	9.20					
Other	0	0	35	3.54					

\* Represents significance at alpha = 0.05.

**Table 2.**

LIBRE Profile domain scores, working vs nonworking burn survivor sample

	<b>Working (N= 320)</b>	<b>Not Working (N= 281)</b>	<b>P</b>
Family and friend	52.49 (10.25)	49.02 (10.38)	<.0001
Social activities	55.62 (9.42)	48.52 (10.13)	<.0001
Social interactions	48.81 (9.51)	45.66 (10.08)	<.0001

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**Table 3.**

Confirmatory factor analysis, Work and Employment domain

Number of Items	11	10*
Chi-square ( <i>df</i> , <i>P</i> )	496.807 (44), 0	356.562 (35), 0
CFI	0.954	0.962
TLI	0.943	0.951
RMSEA	0.101	0.095

\* After removing item Q410R (“Please specify your level of agreement, my boss feels I can do my work.”).

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**Table 4.**

Differential item function, Work and Employment domain

Item	IRT DIF	Logistic Regression DIF (Y/N)(R <sup>2</sup> Change, P)
Please specify your level of agreement:		
Q44r I am satisfied with how much I can do at my job.	N	N (0.0008, .236)
Q420r My emotions make it difficult for me to go to work.	N	N (0.0043, .004)
Q46r I can keep up with my work responsibilities.	N	N (0.0004, .565)
Q419r I am afraid to go to my job.	N	N (0.0018, .119)
Q426r I get tired too quickly at my job.	N	N (0.0008, .338)
Q45r I am satisfied with my work.	N	N (0.0007, .376)
Q417r Compared to others, I am limited in the amount of work I can do.	N	N (0.0054, <.001)
Q43r At my job, I can do everything for work that I want to do.	N	N (0.0014, .119)
Q416r I have enough energy to complete my work.	N	N (0.0071, <.001)
Q412r I work well with coworkers.	Y	N (0.0171, <.001)

Two methods have been used to examine DIF, one is the IRT method, and another is logistic regression method. N, item was not identified as DIF; Y: item was identified as DIF. One item (Q412: Please specify your level of agreement, I work well with coworkers.) was identified as DIF between general population sample and burn survival sample based on IRT DIF method; no item was identified as DIF based on logistic regression method. None of the 10 items were removed.