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Factors associated with life satisfaction among a sample of persons with neurotrauma

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Abstract—Factors were examined that are associated with life satisfaction one year post-discharge for persons with a spinal cord (SCI) or traumatic brain injury (TBI). Findings show persons with SCI or TBI should be considered as two distinct groups with regard to factors affecting life satisfaction. Different strategies might be considered to affect either group. Three psychosocial variables significantly increased life satisfaction for persons with SCI: closeness to family, the level of family activities, and blaming oneself for the injury. For persons with TBI, total family satisfaction, blaming oneself for the injury, being employed, being married, and having memory and bowel independence significantly increased life satisfaction. For persons with TBI, there was a difference in the number of factors affecting life satisfaction dependent on whether the persons blamed themselves or not. Those who do not blame themselves show a greater number of functional activities as indicators for their self-satisfaction.

Key words: *life satisfaction, rehabilitation, spinal cord injury, traumatic brain injury.*

INTRODUCTION

In the instant it takes to damage the spinal cord or delicate brain tissue, social roles are often drastically and permanently altered. Pre-injury abilities and expectations may never be realized; but, in an ever-increasing number of instances, life continues. In fact, life expectancy today for persons with spinal cord injury (SCI) and traumatic brain injury (TBI) approaches that of uninjured persons. Moreover, for persons with catastrophic disability, rehabilitation requires ongoing adjustments between their pre- and postinjury selves and between their postinjury selves and society (1–3).

Because of the complexity of the postinjury adjustment process, we examined the relationships between rehabilitation and life satisfaction; an important outcome measure for persons with SCI or TBI. An individual's subjective perceptions can affect rehabilitation outcomes. For example, self-reported life satisfaction (a blending of psychological, social, and physical well-being) has been used as a measure of successful rehabilitation (4). It must be borne in mind, however, that definitions of a satisfactory life situation may differ dramatically from person to person. Variables expected to be associated with self-reported life satisfaction 12 months after hospital discharge included a number of psychosocial factors, severity of injury, functional skills, employment status, and demographic factors, such as age, gender, race, and marital status.

The family system is an essential component of dealing with psychosocial aspects of injury, especially with regard to physical and emotional care-giving (5–7).

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Families can provide practical help in menial day-to-day tasks, such as grooming, as well as in less obvious, but equally critical social support networks. Severe injuries, however, often impose enormous strains on the family (8,9). For example, persons with TBI have higher rates of marital separation than the general population (7).

Coping is an important factor in the rehabilitation process. Individuals with the best coping skills are most likely to have the highest perceived quality of life (3). Positive self-concepts are associated with successful rehabilitation and certain personality factors may affect rehabilitation (2). Blaming oneself is an important aspect of coping, since it involves coming to grips with the consequences of personal behavior. Earlier work by Bulman and Wortmann (10) demonstrated a positive relationship between self-blame and coping, although later studies (11) suggest mixed findings on this issue.

Establishing the severity of injury is more uncertain for persons with TBI than SCI. Clinical uncertainty plays an important role in rehabilitation, particularly in determining a person's access to services (12). Social and demographic factors significantly affect referral patterns for persons with TBI under conditions of diagnostic uncertainty (13).

Employment was once considered the ultimate expression of a successful rehabilitation program, but now, success is likely to mean more than simply returning to work. For example, current research argues that while returning to work is an important marker of rehabilitation success, the work must be viewed as valuable by the person (14). In addition, employment is often linked to self-actualization, and an SCI or TBI may act as a barrier to complete fulfillment of this particular life dimension (14–16). Several studies suggest, however, that employment is less important in increasing life satisfaction for persons with SCI and TBI than previously believed (4,17,18).

Functional ability is another significant predictor of successful rehabilitation. Since rehabilitation may also improve functional ability, its effect may be difficult to isolate (5,19). Bach and Tilton (20) examined the effects of complete traumatic tetraplegia on life satisfaction and well-being. They found at all levels of functional ability, people's life satisfaction and well-being correlated best with family and social interaction. Moreover, increased functional ability had a positive impact on employment after injury (21).

Researchers have also studied relationships between life satisfaction and specific injury types (4,12). Based on a sample of 100 SCI males and 40 SCI females, one study (4) found that persons with SCI had lower life satisfaction than those in the general population. In addition, life satisfaction was found to be a highly personal and subjective matter with considerable variation. This study concludes that life satisfaction should be considered a *subjective* rather than an *objective* measurement. Furthermore, individuals who indicated being satisfied with family relationships, which are admittedly quite subjective in nature, reported the *highest* life satisfaction (4). By contrast, they found that employment, a traditionally held indicator of adjustment (and an easy one to verify objectively), had the *lowest* life satisfaction in this study group.

METHOD

Study Sample

The study sample consisted of 175 persons with TBI (N=137) or SCI (N=38) drawn from a larger longitudinal study (N=3,156) being conducted by the University of Alabama at Birmingham's Injury Control Research Center. Longitudinal study data included information acquired from a retrospective acute care medical record review and 12-month postdischarge telephone interviews with persons who had sustained an SCI, a TBI, an intra-articular fracture of the lower extremity, or a severe burn. Data were collected by our own abstractors using a standardized instrument; thus eliminating variation between hospitals. Criteria for inclusion in the longitudinal study were: 1) having sustained one or more of the four injuries cited previously; 2) an acute care length of stay of 3 or more days; 3) residing and being injured in Alabama; 4) being discharged alive from acute care between October 1989 and March 1991; and 5) participating in a 12-month follow-up interview. In addition, persons in this study were between 18 and 64 years of age.

The overall longitudinal study population was drawn from injured persons who were discharged from one of eight hospitals serving a representative cross-section of injured patients in north-central Alabama. The hospitals included 5 of the State's 15 trauma centers, and 3 of 15 hospitals in the state providing inpatient and/or outpatient rehabilitation services. Four hospitals were located in counties with large urban centers that have historically served as referral centers for patients from throughout the state. The other hospitals represented the more rural areas in the northern part of the state and were the site of trauma

centers or rehabilitation services for their geographic catchment area.

Measurement

Life satisfaction 12 months after discharge from acute care was the dependent variable in the analysis. This variable was measured by the "Life Satisfaction Index-A" (LSI-A) total score (22). This index represented a multidimensional concept generated from the response (i.e., agree or disagree) to 20 specific statements measuring zest for life, mood tone, and congruence between desired and achieved goals. The LSI-A is a validated instrument used in a recent study of life satisfaction among persons with SCI, which found it positively correlated with self-assessed health, perceived control, and social support (4).

Functional independence was measured by the "Functional Independence Measure" items on memory and bowel independence (23); family satisfaction by the "Family Satisfaction Scale" (24); self-blame by whether persons blamed themselves for the injury; and socio-demographic factors such as employment status, marital status, and age.

Statistical Analyses

Multiple regression analysis was used to estimate the additive and multiplicative effects of the independent variables on life satisfaction while simultaneously controlling for other independent variables in the model. The amount of variation explained in life satisfaction 1 year after discharge was also ascertained. Several multiple regression analyses were conducted and the most parsimonious model for each injury is presented in **Table 1**.

Table 1.
Significant predictors of life satisfaction.

Traumatic Brain Injury Group		**Beta**	
	Family Satisfaction	.402	
	Employment Status	.158	
	Memory Independence	.184	
	Bowel Independence	.173	
	Marital Status	.213	
	Self Blame	−.170	
$R^2 = .46$	F = 15.34		$P < .0001$
Spinal Cord Injury Group		**Beta**	
	Closeness to Family	.547	
	Family Activities	.352	
	Self Blame	−.234	
$R^2 = .58$	F = 15.49		$P < .0001$

RESULTS

As reflected in **Table 1**, six variables were significantly associated with increased life satisfaction in the TBI model: increased family satisfaction, being married, increased memory and bowel functioning independence, being employed, and blaming oneself for the injury. In the SCI group model, three variables were significantly associated with increased life satisfaction: satisfaction with the closeness to one's family, satisfaction with family recreational activities, and blaming oneself for the injury.

Based on our data, persons with TBI or SCI should be considered as two distinct groups with regard to factors affecting life satisfaction. The three variables that were significant for persons with SCI were all of a *psychosocial* nature: satisfaction with closeness to family, satisfaction with family activities, and self-blame for the injury. For persons with TBI, life satisfaction was affected by the psychosocial variable of family satisfaction, the two demographic variables of employment and marital status, two functional skill variables—memory and bowel independence, and self-blame.

Family satisfaction is significant when a debilitating injury occurs. For such injuries, social support is a necessary component of life satisfaction. In this regard, studies indicate that family satisfaction has great consequences for adjustment and life satisfaction, and our studies demonstrate this association as well (5–7). Satisfaction with family relationships was the most significant predictor of general life satisfaction. Marital status has often been discussed as positively contributing to life satisfaction in persons with TBI (7). For example, married persons with TBI have reported greater life satisfaction than those who are separated, divorced, never married, or those whose spouse is deceased.

Functional independence has been noted as a good predictor of life satisfaction (20). For persons with TBI, however, only two components of the total functional independence score had significant effects on life satisfaction: memory independence and bowel management independence. Being independent in these two areas of function permits persons to live and work more comfortably with less embarrassment and greater confidence in themselves and their abilities. In contrast, our

study demonstrated that functional independence had no effect on life satisfaction for persons with SCI.

For persons with TBI, employment status was significant in the model. Specifically, persons who were employed after injury reported greater life satisfaction than those unable to work postinjury.

For both TBI and SCI, the placement of blame was significant in affecting life satisfaction. Those accepting blame reported greater life satisfaction than those not doing so. As noted earlier, however, a recent review of the empirical literature on self-blame found mixed support for the relationship between self-blame and positive coping (11). To further investigate this issue, we performed a stratified analysis only for the TBI group. There were too few SCI patients to conduct such an analysis. As **Table 2** reveals, those who do not blame themselves show a far greater number of functional activities that are indicators for their life-satisfaction. For example, family satisfaction was the sole predictor of life satisfaction among those who blamed themselves. By comparison, among persons who do not blame themselves, life satisfaction is obtained through family satisfaction, employment, being married, and having independence in memory and bowel functions. Persons who do not blame themselves have satisfaction with their life as a result of several functional activities. Blaming oneself for the injury may be viewed as dysfunctional insofar as it hinders individuals in achieving life satisfaction through the important avenues of employment, marriage, and independence in memory and bowel functions. There is a need for developing strategies to work with individuals who blame themselves for their injury.

Table 2.
Regression models for TBI study sample stratified for self-blame.

Do not Blame Themselves		
		Beta
	Family Satisfaction	.434
	Employment Status	.216
	Memory Independence	.177
	Bowel Independence	.204
	Marital Status	.201
R^2 = .54	F = 16.81	P < .0001
Blame Themselves		
		Beta
	Family Satisfaction	.351
	Employment Status	.031 (NS)
	Memory Independence	.220 (NS)
	Bowel Independence	.088 (NS)
	Marital Status	.223 (NS)
R^2 = .32	F = 2.98	P < .05

NS = not significant

CONCLUSION

All persons, whether nondisabled, injured, or permanently disabled, do not exist in a vacuum unless they are comatose—they must interact with the larger society. Factors found significant in this study reflect wide-spread societal norms. Persons (although injured and having disabilities) had greater life satisfaction if they were employed, married, could remember things, could empty their bowels independently, and had a good family life.

Our data have important implications for the social psychology of rehabilitation concerning what it means to be satisfied with one's fate. As we have demonstrated, the issue of blaming oneself may be a dysfunctional part of the postinjury adjustment process. To this end, rehabilitation researchers must recognize and accept that "living with a disability" invariably carries different meanings for different individuals. As Crisp (25) has recently argued, "qualitatively-based studies will contribute much to our understanding of how persons experience their injuries." To explore this significant issue more fully, researchers must allow and encourage persons with disabilities to talk at length about what their injuries mean to them.

REFERENCES

1. Nakajima A, Honda S. Physical and social condition of rehabilitated spinal cord injury patients in Japan: a long-term review. Paraplegia 1988:26:165–76.
2. Koehler M. Relationship between self-concept and successful rehabilitation. Rehabil Nurs 1989:14(1):9–12.
3. Nieves C, Charter R, Aspinall M. Relationship between effective coping and perceived quality of life in spinal cord injured patients. Rehabil Nurs 1991:16(3):129–32.
4. Fuhrer M, Rintala D, Hart K, Clearman R, Young M. Relationship to life satisfaction to impairment, disability, and handicap among persons with spinal cord injury living in the community. Arch Phys Med Rehabil 1992:73(June):552–7.
5. Yarkony G, Roth E, Lovell L, Heinemann A, Katz R, Wu Y. Rehabilitation outcomes in complete C5 quadriplegia. Am J of Phys Med Rehabil 988:67(2):73–6.

6. McMordie W, Rogers K, Barker S. Consumer satisfaction with services provided to head-injured patients and their families. Brain Inj 1991:5(1):43–51.
7. Liss M, Willer B. Traumatic brain injury and marital relationships: a literature review. Int J Rehabil Res 1990:13:309–20.
8. Stambrook M, MacBeath S, Moore A, Peters L, Zubek E, Friesen I. Social role functioning following spinal cord injury. Paraplegia 1991:29:318–23.
9. McGowan M, Roth S. Family functioning and functional independence in spinal cord injury. Paraplegia 1987:25:357–65.
10. Bulman RJ, Wortmann CB. Attributions of blame and coping in the real world: severe accident victims react to their lot. J Pers Soc Psychol 1977:35:351–63.
11. Sholomskas DE, Steil JM, Plumer JK. The spinal cord injured revisited: the relationship between self-blame, other blame and coping. J Appl Soc Psychol 1990:20:540–74.
12. Stambrook M, Moore A, Peters L, Zubek E, McBeath S, Friesen I. Head injury and spinal cord injury: differential effects on psychosocial functioning. J Clin Exp Neuropsychol 1991:13(4):521–30.
13. Wrigley M, Yoels W, Webb C, Fine P. Social and physical factors in the referral of people with traumatic brain injuries to rehabilitation. Arch Phys Med Rehabil 1994:75:149–55.
14. Melamed S, Graswasser Z, Stern M. Acceptance of disability, work involvement and subjective rehabilitation status of traumatic brain injured patients. Brain Inj 1992:6:233–43.
15. Whiteneck G, Charlifue S, Gerhart K, Overholser J, Richardson G. Quantifying handicap: a new measure of long-term rehabilitation outcomes. Arch Phys Med Rehabil 1992:73(June):519–26.
16. Oddy M, Coughlin T, Tuerman A, Jenkins D. Social adjustment after closed head injury: a further follow-up seven years after injury. J Neurol Neurosurg Psychiatry 1985:48:564–68.
17. Chase B, King K. Psychosocial adjustment of persons with spinal cord injury. Int J Rehabil Res 1990:13:325–7.
18. Drewes A, Olsson A, Slot O, Andreasen A. Rehabilitation outcome for patients with spinal cord injury. Int Disabil Studies 1989:11(4):178–80.
19. Kanellos M. Enhancing vocational outcomes of spinal cord injured persons: the occupational therapist's role. Am J Occup Ther 1985:39(11):726–33.
20. Bach JR, MC Tilton. Life satisfaction and well-being measures in ventilator assisted individuals with traumatic tetraplegia. Arch Phys Med Rehabil 1994:75(6):626–32.
21. DeVivo MJ, Richards JS, Rutt D, Stover S, Fine PR. Employment after spinal cord injury. Arch Phys Med Rehabil 1987:68:494–8.
22. Neugarten BL, Havinghurst RJ, Sheldon ST. The measurement of life satisfaction. J Gerontol 1961:16:134–43.
23. Keith RA, Granger CV, Hamilton BB, Sherwin FS. The functional independence measure: a new tool for medical rehabilitation. Adv Clin Rehabil 1987:1:6–18.
24. Olsen DH, Sprenkle C, Russell C. Circumplex model of marital and family systems I: cohesion and adaptability dimensions, family types and clinical application. Fam Process 1979:18:3–27.
25. Crisp R. Vocational decision making by sixty spinal cord injury patients. Paraplegia 1992:30(6):420–4.