Relationships Between Community Reintegration and Clinical and Psychosocial Attributes in Individuals With Spinal Cord Injury in a Nigerian City

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Background: The bio-psychosocial model for comprehensive understanding of community reintegration among individuals with spinal cord injury (SCI) varies across communities. Yet, information about community reintegration in Nigeria is not available. **Objective:** To investigate the association between community reintegration and clinical and psychosocial attributes among Nigerians with SCI. **Methods:** Fifty individuals (31 females; 19 males) with SCI aged 38.6 ± 11.1 years participated in this longitudinal survey. Pain, functional ability, and severity of injury were assessed at discharge and at 1, 2, and 3 months post-discharge from inpatient care using the Visual Analogue Scale (VAS), FIM*, and American Spinal Injury Association Impairment Scale (AIS), respectively. Self-esteem (SE), social support (SS), and depression were also assessed using the Self-Esteem Questionnaire, Social Support Questionnaire, and Beck Depression Inventory, respectively. CR was assessed at 1, 2, and 3 months post-discharge using the Reintegration to Normal Living Index (RNLI). Data were analyzed using Spearman's rho correlation and Friedman test. **Results:** The psychosocial and clinical attributes were significantly different from baseline and across the 3 months post-discharge ($p < .0001$), except for SS. CR significantly correlated with level of injury, function ability, SE, and depression across the 3 months post-discharge ($p < .01$). CR was significantly correlated with SS only at 1 month post-discharge ($p = .027$). **Conclusion:** Individuals with SCI had significant improvement in clinical and psychosocial attributes from discharge to 3 months post-discharge. Improvements in these variables were associated with better reintegration into the community. **Key words:** community reintegration, depression, functional ability, pain, self-esteem, social support, spinal cord injury

Spinal cord injury (SCI) is a modern global epidemic,¹ which causes varying degrees of paralysis, sensory loss, sphincteric disturbance, and pain.² These debilitating consequences of SCI negatively affect the patient's physical condition and result in activity limitation and participation restriction.^{3,4} They often lead to compromised ability to perform daily tasks and limit mobility and participation in the community.^{3,5} Restricted participation in social activities impedes community reintegration.³ Therefore, promoting participation is an important goal of rehabilitation for people with SCI.

Participation has been associated with better quality of life in people with SCI.^{6,7} Increased social participation improved community reintegration

and feelings of self-worth and confidence among individuals with SCI.³ Community reintegration leads to life satisfaction and a sense of competence and is essential for psychological and economic well-being.⁸ It has been suggested that poor community reintegration results in a higher mortality rate in individuals with SCI.⁹ Therefore, community reintegration, social participation, and functional independence are important to people with SCI and their families.¹⁰ Yet, the process of reintegrating into the community is usually difficult and challenging for people with SCI.¹¹

Several factors have been shown to potentially affect community reintegration in people with SCI. Strong social support offered by

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caregivers is vital in helping individuals with SCI reintegrate into community life.¹² Lack of support from caregivers such as family and friends who struggle to cope with the huge change in circumstances of their loved one as well as negative attitudes from members of the society at large could inhibit reintegration into the community.¹³⁻¹⁵ Furthermore, lack of psychological support could lead to low mood and depression and consequent limitation in community reintegration.¹³

Pain, a major problem affecting approximately two-thirds of people with SCI,¹⁶ exerts a significant negative impact on many aspects of life. Pain intensity and impact affect an individual's ability to reintegrate into the community after SCI.¹⁷ In addition, age, gender, ethnicity, level of education, severity of neurologic injuries,¹⁷ and environmental factors¹⁸ have also been identified as determinants of community integration and participation among individuals with SCI. Evidence suggests that individuals with more severe neurological injury and older patients have a decreased level of community reintegration after SCI.¹⁹

Rehabilitation for people with SCI is often targeted at minimizing impairments and improving physical function. Despite improvement in functional status following rehabilitation, it has been reported that only a few people with SCI re-engaged in productive life roles.²⁰ It has been demonstrated that most individuals with SCI do not show up for follow-up appointment after discharge from hospital.²¹ A comprehensive understanding of the psychosocial factors that underpin community reintegration is important for the development and implementation of targeted interventions to enhance reintegration and improve health outcomes.^{22,23} Racial and ethnic variations in psychological functioning and quality of life following a traumatic SCI have been suggested in literature.²⁴ To the best of our knowledge, no study has examined the relationship between community reintegration and psychosocial variables among Nigerians with SCI. This study investigated the relationship among clinical attributes, psychosocial variables, and community reintegration among individuals with SCI in Ibadan, Nigeria.

Methods

This prospective longitudinal survey examined the relationship between community reintegration and selected psychosocial and clinical attributes among individuals with SCI. Eligible participants were patients with no known history of clinically diagnosed psychological/ psychiatric disorders and who were normally resident in Ibadan, to enable follow-up after discharge from inpatient care. They were consecutively recruited from the neurosurgical ward of a teaching hospital in Ibadan, Nigeria, irrespective of the severity/ classification of their injury.

Sociodemographic and clinical variables of age, sex, marital status, occupation, level of education, time since injury, type of injury, level of injury, and cause of injury were obtained from the participants and/or their case files and documented in a data recording form. Their selected clinical attributes (severity of injury, pain, and functional ability) and psychosocial characteristics (self-esteem, social support, and depression) were assessed at the point of discharge from inpatient care, which is the point of recruitment into the study (baseline). Follow-up assessment of community reintegration was conducted at 1, 2, and 3 months post-discharge from inpatient care.

Protocol for this study was approved by the appropriate Institutional Health Research Ethics Committee. The rationale and the procedure for the study were explained to prospective participants before informed consent was obtained.

The severity of injury was determined using the American Spinal Injury Association Impairment Scale (AIS). The scale classifies SCI into five (A-E) levels based on the presence or absence of sacral sparing as well as sensory and motor scores.²⁵ Pain was assessed using the Visual Analogue Scale (VAS). The VAS is a horizontal line, 100 mm in length, anchored by word descriptors at each end. Participants were requested to mark on the line the point that best describes their perceived current pain. Pain intensity was determined by measuring in millimeters from the left hand end of the line to the point indicated by the participant.²⁶ Functional ability was assessed using the Functional Independence Measure (FIM®). The FIM® comprises 18 items that are measured

on a 7-point Likert scale, with 1 indicating *total dependence* and 7 indicating *complete independence*. Thus, possible scores range from a minimum of 18 to a maximum of 126. Higher scores imply more independence.

Self-esteem was assessed using the Self-Esteem Questionnaire.²⁷ It is a 15-item questionnaire scored using a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*disagree*). Each participant was rated based on whether the items described their situation at the point of administration. Reverse scoring was done for negatively worded items, in which case a score of 5 becomes 1 and a score of 1 becomes 5. Obtainable scores range from 15 to 75, with higher scores indicating better self-esteem. The Social Support Questionnaire-Short Form (SSQ6)²⁸ was used to assess the amount of support each participant had and his/her level of satisfaction with the support being received. Participants indicated from 0 to 9 the number of support persons they were likely to have for six situations (number score) and rated their overall satisfaction with the support provided using a 6-point Likert scale (satisfaction score). Higher score is indicative of more satisfaction with the social support received. The Beck Depression Inventory (BDI) was used to evaluate depression in the participants. The BDI has 21 questions scored on a scale of 0 to 3. Scores for all items are summed. Obtainable scores range from 0 to 63. Scores of 0 to 13 indicate minimal depression; 14 to 19, mild depression; 20 to 28, moderate depression; and 29 to 63, severe depression.²⁹

Community reintegration was assessed at 1, 2, and 3 months post-discharge from inpatient care using the RNLI questionnaire. The RNLI is made up of 11 declarative statements assessing participation in community, recreation, family, and other relationships.³⁰ Responses are recorded on a 4-point categorical scale from 1 to 4 (1 = *does not describe my situation*, 2 = *describes my situation a little*, 3 = *describes my situation a lot*, 4 = *fully describes my situation*) to yield total values ranging from 11 to 44, with higher scores indicating better perceived integration. To avoid data setting, the order of administering the instruments to the participants was randomized. All questionnaires were administered by the same researcher.

Data analysis was carried out using the IBM Statistical Package for the Social Sciences (IBM SPSS) version 21. Descriptive statistics of median and interquartile range (IQR) were used to summarize the data obtained. Friedman tests were performed to evaluate community reintegration from 1 month to 3 months post-discharge. Post hoc analysis was carried out using the Wilcoxon signed rank test. Spearman rho correlation was used to test the relationships between community reintegration and each clinical and psychosocial attribute. Level of significance was set at $p < .05$.

Results

Fifty-nine individuals with SCI were recruited for this study. Fifty participants (19 males and 31 females) aged 28 to 62 years (mean, 38.6 ± 11.1 years) completed the study. Those lost to follow-up (15.3%) were comparable to those who completed the study. The sociodemographic and clinical characteristics of the participants who completed the study are presented in **Table 1**. The majority of the participants (58.0%) had cervical spine injury, with C3 and C4 being the modal level of injury. More than half (56.0%) of the participants had incomplete injury ranging from AIS B to E. The majority of the participants (60.0%) had traumatic SCI.

There was a significant difference in each of the clinical and psychosocial attributes scores ($p < .05$) across the time points (**Table 2**). The community reintegration score of the participants similarly increased across the 3 months post-discharge ($\chi^2 = 52.77$; $p < .01$). Post hoc analysis revealed that community reintegration was significantly better at months 2 (median = 26.5; IQR = 14.0) and 3 (median = 29.0; IQR = 12.5) compared with month 1 ($p = .01$) and at month 3 compared with month 2. The correlation between community reintegration and each of the clinical attributes (pain and functional ability) at 3 months post-discharge is presented in **Table 3**. There was a significant positive relationship between functional ability and community reintegration at 1, 2, and 3 months post-discharge from inpatient care ($p < .01$). A significantly negative correlation was found between community reintegration and depression at 1, 2, and 3 months post-discharge ($p < .05$).

Table 1. Demographic and clinical characteristics of participants ($N=50$)

Characteristics	Frequency (n)	Percentage (%)
Sex		
Male	19	38
Female	31	62
Marital status		
Single	19	38
Married	31	62
Level of education		
Primary	10	20
Secondary	12	24
Tertiary	28	56
Employment status at SCI onset		
Employed	29	58
Unemployed	21	42
Level of injury		
Cervical	29	58
Thoracic	14	28
Lumber	7	14
Severity of injury, AIS		
A	22	44
B	9	18
C	6	12
D	10	20
E	3	6
Mode of injury		
Traumatic	30	60
Non-traumatic	20	40
Mean age $\pm$ SD, years	36.6 $\pm$ 11.1	

Note: AIS = American Spinal Cord Injury Association Impairment Scale.

There was a significant correlation between pain and each of the psychosocial attributes at discharge and 3 months post-discharge (**Table 4**). Similarly, there was a significant correlation between functional ability and each of the psychosocial attributes at discharge and at 3 months post-discharge ($p < .05$).

Discussion

This study investigated the relationship between community reintegration and selected clinical and psychosocial attributes of 50 individuals with SCI

from 1 month to 3 months post-discharge from inpatient care. Majority of the participants were young adults, as the mean age (38.6 ± 11.1 years) indicated. Whereas age at SCI was not a focus of this study, the mean age of the participants in this study is in line with the reports from previous studies such as Ackery et al³¹ who reported a high incidence of SCI among young adults. Obalum et al³² also observed that SCI primarily affects young adults in Nigeria. Although the participants were recruited without sex bias, more females than males took part in this study. This is contrary to the findings of earlier researchers who reported more males than females in the population of people with SCI.³²⁻³⁴ This male preponderance was believed to be due to their greater engagement in outdoor activities than females.³⁵ The sex trend found in this present study may be a chance occurrence considering the small sample size and the fact this is a hospital-based study that may not reflect the general population pattern. The majority of the participants had traumatic SCI. Road traffic accident was the leading cause of SCI among the participants. This may be a result of many factors, the most notable of which is the increasing use of commercial motorcycles for transportation without enforcement of road safety regulations in the Nigerian community where this study took place.

Majority of the participants in the present study reported minimal pain. This is contrary to previous reports on the prevalence of pain among SCI population. This disparity in our findings and those of previous reports may be related to the instrument used to assess pain in this study. According to Furlan et al,⁴ the reliability and responsiveness of the VAS for assessing pain in the SCI population requires investigation. Patients with SCI tend to focus more on their need for motor and functional recovery than pain. They also often assume pain is a normal phenomenon that resolves as rehabilitation progresses and therefore they perceive pain as part of their “no pain, no gain” belief, which leads to the underreporting of pain. Yet, pain is known to affect motor outcome following neurological injury.

The community reintegration score of the participants was low and was not significantly different until the third month post-discharge.

Table 2. Median and interquartile range (IQR) of clinical and psychosocial attributes at discharge, and at 1, 2, and 3 months post-discharge

	At discharge		Month 1		Month 2		Month 3		<i>p</i>
	Median	IQR	Median	IQR	Median	IQR	Median	IQR	
RRNLI			26.5	14.0	26.5	14.0	29.0	12.5	<.01
VVAS	0.0	2.0	0.0	1.0	0.0	0.0	0.0	0.0	<.01
FFIM	71.0	49.0	77.0	51.5	85.5	48.8	96.0	50.5	<.01
SSEQ	44.0	13.8	44.0	13.8	44.0	13.8	44.0	15.3	<.01
SSSQ6	30.0	6.0	30.0	6.0	30.0	6.3	30.0	6.3	1.00
BBDI	30.0	11.5	30.0	11.5	29.0	12.0	28.0	11.5	.01

Note: FIM =Functional Independence Measure; RNLI = Reintegration to Normal Living Index; SEQ = Self-esteem Questionnaire; SSSQ6 = Social Support Questionnaire; VAS = Visual Analogue Scale.

Table 3. Correlation between community reintegration and clinical and psychosocial attributes of participants from discharge to 3 months post-discharge (*N*=50)

Variable	Community reintegration					
	Month 1		Month 2		Month 3	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Pain	-0.20	.16	-0.16	.23	-0.31	.38
Severity of injury	0.60	<.01	0.68	<.01	0.57	<.01
Functional ability	0.73	<.01	0.77	<.01	0.65	<.01
Social support	-0.31	.03	0.26	.07	0.21	.14
Self-esteem	-0.32	.01	0.42	<.01	0.44	<.01
Depression	-0.61	<.01	-0.52	<.01	-0.33	.02

Table 4. Correlation between psychosocial and clinical variables at discharge and 3 months post-discharge

	Self-esteem		Social support		Depression	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
At discharge	-0.12	.01	-0.16	.02	0.04	.01
Pain (VAS)	0.59	.01	0.32	.02	-0.49	.01
Functional ability						
3 months post-discharge						
Pain (VAS)	0.41	.01	-0.30	.01	-0.20	.02
Functional ability	0.55	.01	0.20	.02	-0.51	.01

Note: VAS = Visual Analogue Scale.

This is similar to the findings of Ahmed et al³⁶ who also reported low community reintegration among individuals with SCI in Bangladesh. Individuals with SCI in developing countries often face harsh terrains and inaccessible homes and communities,

and this may limit community reintegration.³⁷ This also could have contributed to the low community reintegration scores in this study. Furthermore, it is possible that at the first month post-discharge, participants had not yet adjusted to the realities

of their injury and the environmental challenges they would face. Most public buildings in Nigeria have been adjudged inaccessible to individuals with disabilities.^{38,39} The slight improvement seen in the third month post-discharge may therefore be a reflection of the participants' adjustment by taking up self-care and social roles during the time when social support from their informal caregivers would be reducing.

Participants in this study had moderate self-esteem across the post-SCI trajectory assessed. Evidence suggests that inpatient rehabilitation positively impacts self-esteem.^{40,41} Considering that assessment commences immediately after inpatient rehabilitation, this could have accounted for the self-esteem recorded in this study. Likewise, it has been postulated that restoration of self-esteem occurs despite an initial compromise by SCI.⁴² The depression score for participants in this study is relatively high, as indicated by severe depression on the BDI. However, there was a significant decrease in the scores over the 3 months post injury. Earlier studies have likewise reported high prevalence of depression among individuals with SCI, which is worse immediately post injury but decreases over time.⁴³⁻⁴⁵ SCI is a sudden devastating and life-altering event that primarily affects young, able-bodied individuals. Adjusting to life after an SCI can be difficult and may result in major depressive disorders.⁴⁶

There was a negative but not significant correlation between pain and community reintegration across the 3 months post-discharge. This suggests an improvement in community reintegration as pain intensity reduced. According to Whiteneck et al,¹⁷ pain intensity and pain impact affect an individual's ability to reintegrate into the community after SCI. Pain negatively impacts an individual's activities and perception of how well they are able to integrate into the community.⁴⁷ It has negative impact on the physical, emotional, and mental health of individuals with SCI and has been found to play a role in early and long-term integration.^{48,49} It is therefore important to effectively manage pain in individuals with SCI in order to enhance their reintegration into the community.

Functional ability was positively correlated with community reintegration of the participants across the 3 months post-discharge. This suggests that improvement in functional ability may contribute to reintegration into the community. The debilitating consequences of SCI often lead to compromised ability to perform daily tasks and limit mobility and participation in the community.⁵ Functional deficits in individuals with SCI have been associated with a limitation in social participation and consequent reduction in community reintegration.³ In addition, pain could be a barrier to performance of daily activities¹⁵ and contribute to poor community reintegration. It is therefore expected that improvement in function would result in improved community participation. When individuals with disability have functional autonomy, they tend to participate better in social and community activities. People with a higher level of functional performance were more likely to report a higher level of community participation.⁵⁰

Self-esteem was significantly better over the 3 months post-discharge and was significantly and positively correlated with community reintegration scores at each of the three time points after discharge. This suggests that as community reintegration improved, self-esteem was enhanced. This trend is similar to the reports of Geyh et al⁵¹ that self-esteem and self-efficacy were stronger correlates of participation than symptoms of anxiety, depression, pain, health conditions, social support, and coping styles. Greater social participation results in increased community reintegration and improved feelings of self-worth and confidence.³ It may also be that improvement in self-esteem leads to better community reintegration.

Social support was significantly correlated with community reintegration only at 1 month post-discharge from inpatient care. An association between social support and better health and functioning in individuals with SCI has been reported.⁵² Suttiwong et al⁵⁰ similarly identified social support as one of the predictors of community participation among Thai persons with SCI. Social support enhances the confidence

needed for participation in the community^{53,54} and may help people with disabilities to relieve stress by facilitating healthy behaviors.⁵⁵ Social support is an important predictor of physical and mental health as well as quality of life in SCI.⁵² Strong social support offered by parents, immediate family, close friends, a partner, or other family members is vital in helping people with SCI reintegrate into community life.¹² According to Dijkers,⁵⁶ social role functioning and interactions with family and friends are highly important to recovery among individuals with SCI. In Nigeria, family, friends, and neighbors often take turns caring for loved ones who are ill and this provides the needed psychological support for such patients. However, as illness becomes protracted, social support dwindles as family and friends may have to return to work to financially support the affected individual. This could have accounted for the findings at 2 and 3 months post-discharge.

There was a significant inverse correlation between community reintegration and depression among the participants at 1, 2, and 3 months post-discharge. This suggests that depression in an individual with SCI results in poor community reintegration. Earlier studies had reported an association between depression and poor community and social integration among individuals with SCI.^{13,15,53} Scelza et al²³ similarly reported an association between depression and poor subjective health, decreased satisfaction with life, and more difficulty with daily role functioning.

Limitations

Participants were recruited at the point of discharge from inpatient care and were just transitioning into their respective community. Their level of reintegration into the community might have been limited and not a true reflection of reintegration over the long term. Results from the study may be different with longer follow-up period beyond 3 months. In addition, a multivariate analysis for a comprehensive assessment of the associations among the variables could not be performed due to the small sample size. Although previous studies have demonstrated a relationship between community reintegration and environmental accessibility and transportation, these factors were not accessed in this study. Future research is needed to explore the relationship between community reintegration and environmental barriers, including the lack of disability-friendly transportation for individuals with SCI.

Conclusion

The findings in this study revealed a significant correlation between community reintegration and functional ability, self-esteem, and depression among individuals with SCI over the first 3 months post-discharge. Rehabilitation efforts should target improvements in clinical status and psychosocial attributes to enable better community reintegration among individuals with SCI.

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