

# Community reintegration and related factors in a Nigerian stroke sample.

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## Abstract

**Background:** The goal of stroke rehabilitation has shifted from mere survival of a victim to how well a survivor can be effectively reintegrated back into the community.

**Objectives:** The present study determined the level of satisfaction with community reintegration (CR) and related factors among Nigerian community-dwelling stroke survivors (CDSS).

**Methods:** This was a cross-sectional survey of 71 volunteering CDSS (35 males, 36 females) from selected South-Eastern Nigerian communities. Reintegration to Normal Living Index was used to assess participants' CR. Data was analysed using Spearman rank-order correlation, Kruskal-Wallis and Mann-Whitney U tests at  $p \leq 0.05$ .

**Results:** Participants generally had deficits in CR which was either mild/moderate (52.1%) or severe (47.9%). Scores in the CR domains of distance mobility, performance of daily activities, recreational activities and family roles were particularly low (median scores  $\leq 4$ ). CR was significantly correlated with and influenced by age ( $r = -0.35$ ;  $p = 0.00$ ) and presence/absence of diabetes mellitus ( $u = 3.56.50$ ;  $p = 0.01$ ), pre- ( $k = 6.13$ ;  $p = 0.05$ ) and post-stroke employment ( $k = 18.26$ ;  $p = 0.00$ ) status, type of assistive mobility device being used (AMD) ( $k = 25.39$ ;  $p = 0.00$ ) and support from the community ( $k = 7.15$ ;  $p = 0.03$ ) respectively.

**Conclusion:** CR was generally poor for this CDSS sample. Survivors who are older, having diabetes as co-morbidity, using AMD (particularly wheel-chair) and without employment pre- and/or post-stroke may require keener attention. Rehabilitation focus may be targeted at enhancing mobility functions, vocational and social skills.

**Keywords:** Community reintegration, associated factors, post-stroke.

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## Introduction

Stroke is a major cause of long-term disability and the second leading cause of death globally, with an associated high economic cost and a detrimental impact on the physical, social, and psychological functioning of the survivors<sup>1,2</sup>. The incidence of stroke and its associated disabilities is reportedly increasing even in poor and medically-less developed countries<sup>3</sup>. An increasing number of stroke victims are surviving the attack due to better acute rehabilitation care and the availability of better information on stroke management<sup>4</sup>. Majority of these survivors are however left with varying degrees of dis-

ability<sup>5</sup> restricting their reintegration into the community, and potentially negating the best efforts of rehabilitation<sup>6-11</sup>. Consequently, the goal of stroke rehabilitation has shifted from mere survival of a victim to how well a survivor can be effectively reintegrated back into the community<sup>8,12</sup>.

Community reintegration is defined as the opportunity an individual has to live in the community with the already present condition (after a state of ill-health like stroke) and be valued for his/her uniqueness and abilities, like everyone else<sup>13</sup>. It is the most important and ironically the most underestimated area of stroke rehabilitation<sup>6</sup>. The constituting domains of community reintegration may include recreation/leisure integration, social network integration, residential integration, employment/economic integration, employment stability, personal satisfaction, independent living, family role, general coping skills and so on<sup>8,11,12,14</sup>. However, the conceptualization of community

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reintegration reportedly varies considerably across different authors, cultures, environments, groups, age groups and across people with different kinds and degrees of disabilities<sup>9,15</sup>. Self-perceived participation in community activities is thought to reflect individuals' perception and satisfaction with their level of community reintegration<sup>9</sup>. The level of satisfaction of a stroke survivor with community reintegration reportedly varies and depends on complex interactions between functional, personal and environmental factors<sup>9,16,17</sup>. These factors may include quality of life (QOL), acuteness or chronicity of stroke, balance ability, falls and balance self-efficacy, depression, age, level of social support, exercise training, return to work and normal walking<sup>6,9,11,18-21</sup>. Similar to community reintegration, QOL is a broad-ranging concept affected in a complex way by the persons' physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment<sup>22</sup>. The degree of reintegration achieved by patients after an incapacitating illness is seen as contributing to the quality of their lives, with both constructs (QOL and reintegration) being important to measure when therapeutic goals cannot include a cure but are directed at controlling the disease process or fostering compensation for impairment<sup>23</sup>.

Problems with community reintegration among stroke survivors from the Western nations are well-reported in literature. Only few studies from Africa and Nigeria particularly had investigated community reintegration among the group. The only available reports from Nigeria were from the South-Western region<sup>24,25</sup>. These studies did not reflect some of the factors investigated in the present study and were institution-based. The region is also different in terms of culture, values and environments to the South-East. This study on the other hand, aimed at determining the level of community reintegration and factors that may either influence or be related to it among community-dwelling stroke survivors from South-East, Nigeria.

## Methods

This was a cross-sectional survey of community reintegration and its associated factors among stroke survivors recruited from five randomly-selected communities from

two local government areas (three from Nnewi North and two from Nnewi South) in Anambra State, South-East, Nigeria. The Ethical Committee of Nnamdi Azikiwe University Teaching Hospital approved the study. Participants were volunteers who responded to publicized adverts carried out by town criers and also through churches' bulletin and community leaders. Through these volunteers, other participants were also recruited using the snowballing sampling technique. Sampled survivors were only those who were able to speak or write in the English language. Individual participants gave written or verbal consent after due explanation of the study's procedure.

Information on the age, gender, marital status, pre- and post-stroke employment status, form of marriage, usage of assistive devices, presence or absence of co-morbidity among participants and whether or not the participant was receiving physiotherapy or not were obtained by oral interview. Participants were also asked to rank the level of support they received from the family and from the community as high, modest or low in line with their personal expectations. The Reintegration to Normal Living Index (RNLI) was used to estimate the level of satisfaction with community reintegration among the participants. The RNLI is an 11-item instrument with the following domains: indoor mobility, community mobility, distance mobility, self-care, daily activities (work and school), recreational activities, social activities, family roles, personal relationships, presentation of self to others, and general coping skills<sup>24,26</sup>. The first 8 items in the RNLI represent 'daily functioning' and the remaining 3 items represent 'perceptions of self'<sup>18</sup>. Each item is accompanied by a 10cm visual analogue scale anchored with phrases of 0-no integration to 10-full integration<sup>27</sup>. The sum of the scores is normalized to 100 such that the minimum possible score is 0 and maximum is 100, indicating no or full integration respectively. Scores of 60 through 99 indicate mild to moderate restrictions in self-perceived community reintegration, and scores less than 60 indicate severe restrictions in self-perceived community reintegration<sup>9</sup>. Adequate to excellent construct validity and reliability of the RNLI has been reported<sup>28-30</sup>. The RNLI was either self- or researcher-administered to each participant depending on the participants ability to read in English Language.

Statistical analysis was done with SPSS (version 16). The descriptive statistics of frequency, percentages, mean and standard deviation were used to summarize the demographic variables and RNLI scores of the participants; Spearman rank-order correlation was used to assess the relationship between selected participants' demographics and their score on RNLI; Kruskal-Wallis and Mann-Whitney tests were used to establish the differences in the RNLI score among different socio-demographic categories of participants. Level of significance was set at  $P \leq 0.05$ .

## Result

Seventy-one stroke survivors (mean age =  $64.14 \pm 10.26$  years; range: 41-82 years) participated in the study. Thirty six (50.7%) were females and 46 (65%) were using mobility assistive devices (canes, wheelchairs and Zimmer's frames). More than three-fifth (66%) of the participants lost their employment post-stroke, and while most regarded the level of support from the family to be high, a good proportion (40.8%) ranked the level of support from the community to be rather low (table 1).

**Table 1: Demographic characteristics of the participants**

Demographics	Category	Frequency	Percentage
Marital status	Married	63	88.7
	Divorced	7	9.9
	Separated	1	1.1
Pre-stroke ES	EPPC	12	16.9
	Self-employed	48	67.6
	Unemployed	11	15.5
Post-stroke ES	EPPC	2	2.8
	Self-employed	18	25.4
	Unemployed	51	71.8
Hypertension	Present	48	67.6
	Absent	23	32.4
Diabetes mellitus	Present	27	38.0
	Absent	44	62.0
Marriage type	Monogamy	62	87.3
	Polygamy	9	12.7
Use/type of Assistive Devices	Cane	24	33.8
	Wheelchair	19	26.8
	Zimmer's frame	3	4.2
	Nil	25	35.2
LOS from family	High	54	76.1
	Moderate	16	22.5
	Low	1	1.4
LOS from Community	High	12	16.9
	Moderate	30	42.3
	Low	29	40.8
Access to Physiotherapy	Yes	16	22.5
	No	55	77.5

EPPC—Employed in public services and private companies

LOS—Level Of Support

ES—Employment Status

Aside from hypertension and diabetes that was reported by a good number of participants, osteoarthritis was reported by just one participant as co-morbidity. The mean total and overall median RNLI scores of the participants were  $59.37 \pm 22.54$  and 63.00 respectively. Thirty-seven

(52.1%) participants had either mild/moderate deficits in CR while the rest had severe deficits. The participants scored best in indoor mobility and self-care domains (median scores = 9.00) and worst (median scores  $\leq 4.00$ ) in distance mobility, recreational activities, family roles and daily activities (work and school) domains (table 2).

**Table 2: Participants' mean and proportion scores in different domains of the reintegration to normal living index**

Domains	Range	First Quartile	Median	Third Quartile
Indoor mobility	1-10	6.00	9.00	10.00
Community mobility	0-10	2.00	6.00	8.00
Distance Mobility	0-10	0.00	3.00	6.00
Self-care	1-10	6.00	9.00	10.00
Daily Activities	0-10	1.00	4.00	6.00
Recreational Activities	0-10	2.00	4.00	6.00
Social Activities	0-10	3.00	5.00	7.00
Family Roles	0-10	1.00	4.00	7.00
Personal relationships	0-10	5.00	7.00	9.00
Presentation of STO	1-10	5.00	7.00	8.00
General coping skills	0-10	3.00	5.00	7.00
RNLI TOTAL	9-106	41.00	63.00	76.00
RNLI Transformed	8.18-96.40	37.27	57.30	69.09

%- percentage  
 STO—Self To Others  
 RNLI—Reintegration to Normal Living Index

Each of the participants' RNLI total and subscale scores (perception of self and daily functioning) significantly correlated with their age. Perception of self CR subscale scores also significantly correlated with the participants' level of community support. (table 3).

**Table 3: Spearman rank correlation between RNLI scores and selected participants' demographical and clinical variables**

Variables		RNLI Total Scores	PS Scores	DF Scores
Age	r=	-0.351	-0.358	-0.288
	P=	0.003*	0.002*	0.015*
Post-stroke duration	r=	0.011	-0.145	0.057
	P=	0.929	0.227	0.640
Level of support from Community	r=	-0.041	-0.249	-0.006
	p=	0.735	0.037*	0.959
Level of support from Family	r=	0.106	-0.155	0.153
	p=	0.379	-0.198	0.204

\*- Significant at p<0.05  
 RNLI—Reintegration to Normal Living Index  
 PS: Perception of Self Subscale Scores  
 DF: Daily Functioning Subscale Scores

Participants who were employed in public services or private companies (pre- and/or post-stroke) had significantly higher RNLI scores than those that were self-employed (pre- and/or post-stroke) who in turn had significantly

higher RNLI scores than the unemployed participants (pre- and/or post-stroke) (kw= 6.13, p=0.0047 and kw= 18.26, p=0.000). Participants who had diabetes mellitus as a comorbidity had significantly lower RNLI total score than those without the condition (table 4).

**Table 4: Kruskal-Wallis and Mann-Whitney U tests showing the differences in RNLI score among different categories of participants**

Variables	Categories	Mean Rank	K/U	p value
Gender	Male	36.86	600.00	0.730
	Female	35.17		
Presence of Hypertension	Yes	36.27	539.00	0.873
	No	35.45		
Presence of Diabetes Mellitus	Yes	27.20	356.50	0.005*
	No	41.40		
Access to Physiotherapy	Yes	35.95	627.00	0.982
	No	36.06		
Pre-Stroke Employment Status	Employed in PPC	47.17	6.13	0.047*
	Self-employed	35.50		
	Unemployed	26.00		
Post-Stroke Employment Status	Employed	54.00	18.26	0.000*
	Self-employed	51.50		
	Unemployed	29.00		
Usage of Assistive Mobility Devices	Cane	34.56	25.39	0.000*
	Wheelchair	18.63		
	Zimmer's frame	39.83		
	Nil	50.12		
Marital Status	Married	35.89	0.06	0.972
	Divorced	37.43		
	Separated	33.00		
Support from Family	High	34.69	1.82	0.403
	Moderate	41.34		
	Low	21.00		
Support from Community	High	47.54	7.15	0.028*
	Moderate	29.37		
	Low	38.09		

\* Significant at p<0.05  
RNLI= Reintegration to Normal living Index

## Discussion

The level of satisfaction with community reintegration and its related factors were investigated in this study. Participating stroke survivors were similarly spread across both gender just as was found earlier in the same environ-

ment<sup>31</sup>. Other studies on community reintegration have however involved more male survivors<sup>9,24,25</sup>. Though it has been reported that the female gender is a predictor of participation restriction<sup>1</sup>, neither community reintegration nor any of its domains was significantly influenced

by gender in the present study. Previous studies have also failed to establish statistically significant gender difference, though scores for males generally tend to be slightly higher<sup>9,24,25</sup>.

None of the study participants was fully satisfied with their community reintegration just as was reported in other local studies<sup>24,25</sup>. The mean RNLI scores were also comparable between the present study and those other ones, falling between the ranges for moderate to mild deficits and that for severe deficits. However, nearly half the participants in the present study compared to a fifth in the Obembe et al<sup>25</sup> study were experiencing severe restriction suggesting that participants in the present study might be functioning at a lower level. Though functional status was not investigated in the present study, the facts that 65% (compared to 30% from the Obembe et al<sup>24</sup>) of the participants were on mobility aids, with nearly 3 out of every 10 being wheelchair-users and with more severe deficits in community reintegration seems to buttress this. This might also not be unconnected with the fact that only 22.5% were in a rehabilitation (physiotherapy) programme .

The present study was community-based, as opposed to the Obembe et al studies<sup>24,25</sup> that were hospital-based, and might have reflected better the state of community reintegration among stroke survivors in a Nigerian environment. Our findings may be an indication that more functionally-restricted stroke survivors would more likely be found outside the hospital settings. This then would imply the need to have community-based rehabilitation (CBR) programmes to identify this group of survivors within the communities so as to provide them with needed care. Unfortunately, CBR in Nigeria is practically in the hands of a few faith-based non-governmental organizations with support from external agencies. These programmes are rather thinly spread across the country and its various regions to be quite effective. In a country where social security is practically non-existent, the drop in family income, long-term expenses associated with rehabilitation, along with traditional beliefs may have combined to reduce access to rehabilitation among the group with the consequence that nearly half of all survivors were severely restricted.

Those other Nigerian studies<sup>24,25</sup> also involved samples with younger ages, longer post-stroke duration, prepon-

derance of male gender and existing involvement with rehabilitation (physiotherapy services), and were conducted in a region with better basic and social amenities. Younger ages, better functional ability, male gender, longer post-stroke duration, participation in exercise program, better community and social supports, and more supportive physical and social environments have all been reported to be associated with higher level of satisfaction with community reintegration<sup>1,9,11,24,25</sup>. Comparison of mean RNLI scores from the Nigerian studies including the present one with findings from more developed countries revealed poorer level of satisfaction with community reintegration among Nigerian stroke survivors<sup>1,9,11</sup> thus buttressing findings and assumptions of the influence of socio-economic status, environmental and cultural factors on community reintegration<sup>9,15</sup>.

Participant best scores were from indoor mobility and self-care domains while worst scores were from distance mobility and daily activities (work and school) domains of community reintegration. Participants were not fully satisfied with reintegration in any of the domains and their mean domains' scores generally fell within the range for severe deficits except in the indoor mobility, self-care, personal relationships and presentation-of-self-to-others domains. These are domains that are either less-tasking or to some extent under the survivor's control. The tendency for better scores in the indoor mobility and personal relationships domains among stroke survivors have been previously reported<sup>24</sup>. Severe deficits in most domains may reflect poor motor functioning among participants. Obembe et al<sup>25</sup> had reported poor motor functioning to be associated with lower level of community reintegration among stroke survivors. Though the present study did not assess motor functioning, the high percentage of participants using assistive mobility devices particularly wheelchairs and low return rate to pre-stroke employment would suggest low levels of physical and motor functioning. Since the item on the self-care needs asked if participants were comfortable with how their self-care needs were met rather than if they were able to meet those needs themselves, lower levels of restriction in this domain might be because some of these needs were met by others (for example, family members), as suggested by the fact that up to 98.6% of the participants rated the level of support received from their family members as moderate to high. The relatively low level of support from

the communities might also not be unconnected with the reported severe deficits in recreational activities, social activities, and community and distance mobility domains.

The economic impact of stroke on survivors is highlighted by the high proportion of the participants (66%) who lost their employment after stroke in the present study. Other studies have reported return rate to work among previously working survivors to range between 8.8% and <50% post-stroke<sup>32,33</sup>. The present study found significant influence of both pre- and post-stroke occupational engagements on the participants' level of satisfaction with community reintegration. Baseman et al<sup>32</sup> had similarly found social integration among stroke survivors to be related to post-stroke employment status. It is understandable that participants who are able to sustain their employment post-stroke may find satisfaction and contentment in their being able to function at an economically productive level. The fact that those who work in the public service or private companies were mostly unable to return to work may reflect societal attitude towards disability. Though the Disability Act discourages discrimination on account of disability, most employers in the country could hardly tolerate an individual with any form of disability, thus placing the individual at both an economic and social disadvantage.

Similar to a previous report<sup>1</sup>, an inverse relationship exists between participants' ages and level of community reintegration. Though the predominant co-morbidity among participants was hypertension, diabetes mellitus was the condition that significantly and adversely influenced their level of satisfaction with community reintegration. Baseman et al<sup>32</sup> had reported the presence of a co-morbidity to negatively influence the reintegration of stroke survivors. Our finding of a significant relationship between the level of support from the community and satisfaction with community reintegration seems to suggest that survivors perceive support from their communities as a requirement for re-integration back to these same communities.

The finding of no significant relationship between community reintegration and post-stroke duration contradicted the report by Obembe et al<sup>24</sup>. Recruits for the present study included survivors with post-stroke dura-

tion as short as one month, while Obembe et al<sup>24</sup> study involved participants with post-stroke duration not less than 6 months. It seems that the relationship between post-stroke duration and level of community integration becomes apparent only with longer time frame. Participants' ambulatory status influenced their satisfaction with community reintegration. Other researchers have previously reported that poor reintegration into the community after stroke could be predicted by poor functional ability and/or performance<sup>1,25</sup>.

### **Limitations**

The present study recruited a convenience sample of participants who responded to the study advertisement and those they further recommended through snowballing sampling technique. It also recruited only those who could speak or read English Language. It is not known if the profile of the stroke survivors in the sampled communities who were either excluded or could not make it to the centres was different from that of the participants. The study may thus not be generalisable to all stroke survivors. However, the community-based as against hospital-based design allowed for the capture of stroke survivors who were undergoing rehabilitations and those who were not. This probably helped to increase the sample size and the generalisability of the study. Participants' response on the level of social support from either the community or the family were not obtained using any standardized instrument but was adjudged based on individual's expectation. This allowed the participants to rate the degree of support they were enjoying compared to what they might have been expecting.

### **Conclusion**

Community reintegration was rather poor among the sampled community-dwelling stroke survivors with a considerable number actually suffering severe deficits especially in their distance mobility and daily activities. Satisfaction with community reintegration significantly correlated with age and was also significantly influenced by pre- and post-employment status, usage of assistive devices and level of support from the community respectively. Access to rehabilitation was also restricted among the participants. Clinical interventions should be targeted at enhancing survivors' motor and physical functioning and could be more practically delivered under a

community-based rehabilitation (CBR) programme. The government and community stakeholders should, on the other hand, develop and put in place social support and vocational training programmes. Community-dwelling stroke survivors who may be older, having diabetes as co-morbidity, using assistive mobility device (particularly wheel-chair) and who may have lost their pre-stroke employment status may require keener attention.

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