

Predictors of return to work among stroke survivors in south-west Nigeria

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Abstract

Introduction: Stroke is acknowledged globally and among Nigerian rehabilitation researchers as a public health problem that leaves half of its survivors with significant neurological deficits and inability to re-establish pre-existing roles. Consequent to the dearth of country specific data on return to work and its determinants for stroke survivors in Nigeria, this study investigated the predictors of return to work among stroke survivors in south-west Nigeria.

Method: Two hundred and ten stroke survivors from five tertiary health facilities in Osun state, Nigeria responded to a validated three-section questionnaire assessing return to work rates and its determinants after stroke in this study. Collected data were analysed using descriptive statistics and inferential statistic of chi-square, *t*-test and multiple logistic regression.

Result: The mean age of the respondents was 52.90 ± 7.92 years. Over 60% of the respondents returned to work with about half of them in full time employment (32.9%). Majority of the respondents noted that travel to and from work (43.8%) and access at work (43.3%) had an impact on their ability to work. The symptoms of stroke (odds ratio (OR) = 0.87), the environment (OR = 0.83), body function impairments (OR = 0.86) as well as activity and participation problems (OR = 0.80) were the significant predictors of return to work. Hemiplegia or paresis of the non-dominant side of the body was associated with a higher chance of return to work (OR = 7.64).

Conclusion: Body function impairments, activity and participation problems were independent predictors of return to work after stroke. Similarly, side of hemiplegia plays a prominent role in resumption of the worker role of stroke survivors in south-west Nigeria.

Keywords

Stroke, return to work, south-west Nigeria, predictors, survivors

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Introduction

Stroke is a public health concern that is used to describe neurological deficit resulting from acute focal injury that occur in the central nervous system which is of vascular origin (Markus et al., 2016). The World Health Organization (WHO, 2015) reported that about 50% to 83% of stroke survivors have some residual physical disability. In Nigeria, more than a fifth of those affected have severe difficulty in reintegrating into the community (Obembe et al., 2010). Majority of stroke survivors who are most times within working age group have difficulty in resuming premorbid occupational roles (Trygged et al., 2011). The inability to re-establish these pre-existing roles further poses additional challenges on

the society, friends and families of the stroke survivor with regards to the cost and burden of care. Substantive evidence suggests that people who survived

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a stroke event experience lower quality of life and worse psychosocial outcomes compared to apparently healthy controls (Akinpelu & Gbiri, 2009). As work serves as the most central component in a person's adult life (Ross, 2013), return to work (RTW) can improve these outcomes by contributing to life satisfaction, social identity and self-worth of stroke survivors, partly through the independence acquired from income generation (Medin et al., 2006; Vestling et al., 2003). Similarly, obtaining and sustaining gainful employment after experiencing a disease condition like stroke function as a vital rehabilitation outcome measure (Duff et al., 2014).

RTW is the initial stage to re-employment. Treger et al. (2007) established that RTW is prevalent in the initial six months and peaked at two years after stroke. There exists paucity of literature on RTW after stroke in developing nations especially sub-Saharan Africa (SSA). Available literature within SSA include studies by Arowoia et al. (2017); Duff et al. (2014); as well as Peters et al. (2013) with these studies reporting a RTW rate ranging from 34% to 55%. Even though the stroke survivors in the above SSA studies engaged in rehabilitation, they did not receive vocational rehabilitation (VR) intervention. In a systematic review, Baldwin and Brusco (2011) reported the average RTW rate of stroke survivors after engaging in VR to be 49%. A Danish country-wide prospective cohort study observed a RTW rate of 62% in stroke survivors two years post-stroke (Hannerz et al., 2012) while in Singapore, a RTW rate of 7% was found among stroke survivors referred for vocational assessment by Chan (2008). The study population in Hannerz et al. (2012) included individuals of varying worker roles without an indication of their functional level as differences in the definition of work might influence RTW rates across studies. Also, the low RTW rate reported by Chan (2008) may be attributed to the fact that the retrospective review was conducted in a vocational assessment unit. Various factors that have been identified by researchers to predict RTW among stroke survivors include: severity of stroke as indicated by the extent of cognitive and motor impairment; premorbid characteristics of survivor (such as level of education of survivor and job characteristics); availability of professional support and early involvement of an occupational physician in the rehabilitation of survivors (Doucet et al., 2012). There appears to be no consensus on factors that determine RTW after stroke across the available studies. An accurate comparison of the various studies on RTW rate and determinants of RTW after stroke may be difficult as most of the studies explored RTW in different populations at varying follow-up stages. Variation in findings could also be attributed to socio-economic factors across regions. These include

employment and retirement rates, disability compensation structure available within the society and cultural factors like the availability of assistance from members of family.

The WHO ICF core sets for VR were established to document the various aspects of health and the environment that influences work participation after a disease condition (WHO, 2001). With the ICF, work disability could be viewed as a multi-dimensional concept relating to the health condition, body functions and structures, activity limitations, participation restrictions and contextual factors which include environmental and personal factors (Wasserman et al., 2009). Existing studies that have investigated RTW and its determinants have predominantly used standardised outcome measures which often only measure one aspect of the ICF (Üstün et al., 2010). It has been averred that standardised measures used to assess disability, within the framework of the ICF, 'should be linked conceptually and operationally to the ICF to allow comparisons across different cultures and populations' (Cheung et al., 2015). To the best of our knowledge, this is the first study that quantitatively investigated the impairments, limitations in activity performance and the participation restrictions experienced by stroke survivors with a primary focus on work re-integration in SSA. This study therefore explored RTW and its determinants among stroke survivors in south-west Nigeria within the five domains of the ICF.

Methods

Participants

Individuals who had survived a stroke event, aged 18 years and above who resided in Osun state of south-west Nigeria, were invited to participate in this cross-sectional multi-centre study using convenient sampling technique. All the participants had either received or were receiving rehabilitation services that included occupational therapy and/or physiotherapy; had a premorbid work status in the open labour market, and a minimum post-stroke duration of six months. The participants were recruited from five hospitals (Ife Hospital Unit (IHU) and Wesley Guild Hospital (WGH) of the Obafemi Awolowo University Teaching Hospital Complex, Ladoko Akintola University of Technology Teaching Hospital (LAUTECHTH), Osogbo; Seventh day Adventist Hospital (SDA), Ile-Ife; State Specialist Hospital (SSH), Osogbo) in Osun state, Nigeria during a year recruitment period (August 2017–July 2018).

Instrument

A three-section validated questionnaire was used as the survey instrument for this study. The first section of the questionnaire explored the demographic and work related information of the participants (such as gender, age, marital status, employment status, educational level and RTW status) using 17 items that were integrated and adopted from work rehabilitation questionnaire self-report (WORQ; Finger et al., 2014). The second and third sections of the questionnaire used the work impact questionnaire (WIQ; O'Connor et al., 2005) and the ICF brief core sets in VR (Finger et al., 2012) to explore the impairments, limitations in activity performance and the participation restrictions experienced by stroke survivors during work re-integration respectively. The WIQ contains 17 items that are rated on a five point-ordinal scale of 0–4 which represent the extent of the impact of stroke symptoms experienced by the individual and environmental factors on work functioning. While the brief ICF core set for VR consist of 13 items that are rated on a five-point ordinal scale of 0–4 which are the qualifiers scale of the ICF and these represent the extent of difficulties or limitations experienced by an individual along the continuum of RTW process. As the above questionnaires were adopted, to ensure its validity and reliability for the Nigerian context, its psychometric properties were assessed. The questionnaire was validated in a pilot study among 30 stroke survivors who were not included in the main study using the procedure described by Bowling et al. (2004). Before the administration of the pilot questionnaires, post-stroke duration and disability level (modified Ranking Scale) were included in the demographic section of the WORQ questionnaire. Following the pilot testing, two changes were made to the demographic section. These include: changing the question 'what is your post-stroke duration' to 'when did you first have the stroke experience' (how long have you had this stroke experience) and defining the modified ranking score for respondents to choose that which was applicable to them. No further modification was made to the questionnaires. The questionnaire was observed to be internally consistent with a Cronbach alpha value of 0.84 and reliable with test–retest reliability score of 0.91.

Procedure

Ethical approval for the study was obtained from the Ethics and Higher Degrees Committee of the University of the Western Cape, South Africa, the Health Research Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Nigeria and the administrative heads of the different departments and units of participating hospitals.

Subsequently, 271 eligible participants were identified from the medical records of participating hospitals, in Osun state, south-west Nigeria. The purpose of the study was explained verbally and in writing through a subject information sheet to the participants. Two hundred and twenty-nine of the stroke survivors gave signed consent to participate in the study. However, 210 copies of questionnaires distributed were available for analysis thereby yielding a response rate of 76.36% ($n = 210/271$). Nineteen of the questionnaires returned were inaccurately filled or voided.

Data analysis

The socio-demographic and work related characteristics of the participants were summarised using descriptive statistics of standard deviation, frequency and percentages. Similarly, inferential statistics of Pearson chi-square was used to assess the association between each of the participants' demographics, work and health related characteristics and RTW status while independent *t*-test was used to analyse the difference in the clinical characteristics of the respondents as revealed by the domains of the WIQ and ICF brief core sets in VR by RTW status. Variables that emerged as statistically significant ($p \leq 0.05$) from the bivariate analysis were pulled into a binary logistic regression model. The data analysis was managed using SPSS version 24.

Results

The mean age of the participants was 52.90 ± 7.92 years with the range of 25 to 60 years. The demographic and work characteristics of the respondents as well as the RTW status of the participants are presented in Tables 1 and 2. Most of the participants were within the age range of 51–60 years (70.0%), were married (60.5%) and involved in job that required medium level of energy exertion (43.8%; Table 1). Over 60% of the participants had RTW with about half of them in full time employment (32.9%; Table 2). Similarly, the majority of the participants (98.1%) received support from their family members in returning to work. This was indicated to include financial support in order to access rehabilitation services (95.5%), physical support (40.5%) while 28.4% of them received emotional/psychological support from family members. The least support towards RTW was indicated to have come from government agencies with 8.5% of respondents receiving financial support in the form of salary payment while not working (sick-leave allowance).

More than 40% of the participants identified two items from the WIQ as having an impact ranging from 'quite a bit' to 'extreme' on their ability to

Table 1. Demographic and clinical characteristics of participants.

Variable	n (210)	χ^2	p value
Gender			
Female	108 (51.4)	1.99	0.159
Male	102 (48.6)		
Age (years)			
≤ 40	19 (9.0)	28.73	0.741
41–50	44 (21.0)		
51–60	147 (70.0)		
Marital status			
Single**	83 (39.5)	7.06	0.040*
Married	127 (60.5)		
Education level			
No formal schooling	10 (4.8)	8.64	0.071
< Primary school	6 (2.8)		
Primary school	26 (12.4)		
Secondary school	54 (25.7)		
Tertiary†	114 (54.3)		
Have current restrictions			
Yes	163 (77.6)	11.00	0.258
No	47 (22.4)		
Hospital site			
Ife Hospital Unit, Ife	97 (46.2)		
LAUTECHTH, Osogbo	41 (19.5)		
Seven Day Adventist Hospital, Ife	20 (9.5)		
State Specialist Hospital, Osogbo	24 (11.4)		
Wesley Guild Hospital, Ilesha	28 (13.3)		
Hemiplegia/hemiparesis			
Non-dominant	123 (58.6)	32.36	0.001*
Dominant	87 (41.4)		
Disability level (Modified Ranking Scale)			
No symptoms	4 (1.9)	16.86	0.001*
No significant disability	44 (21.0)		
Slight disability	62 (29.5)		
Moderate disability	82 (39.0)		
Moderate severe disability	15 (7.1)		
Severe disability	3 (1.4)		
Time lapse since having a stroke (post-stroke duration)			
Short-term duration	66 (31.4)	42.88	0.034*
Long-term duration	144 (68.6)		
Previous work engagement (sector)			
Public/civil service employment	74 (35.2)	8.25	0.014*
Private sector employment	28 (13.3)		
Self-employed	108 (51.4)		
Work category			
Sedentary	34 (16.2)	8.37	0.050*
Light	59 (28.1)		
Medium	92 (43.8)		
Heavy	25 (11.9)		
Vocational rehabilitation programme			
Engaging in VR training activities (job skills)	49 (23.3)	61.91	0.018*
Prep for employment/internship (apprenticeship)	16 (7.6)		
Activities to maintain/secure job	94 (44.8)		
Looking for a new job/work	51 (24.3)		

LAUTECHTH: Ladole Akintola University of Technology Teaching Hospital.

*Statistically significant at $p < 0.05$.

Single**: Never married, divorced and widowed.

†College, university and postgraduate degree.

work. These items include travel to and from work (43.8%) and access at work (43.3%). The least impact on work ability was observed to occur with swallowing (87.1%) and continence (77.1%; Table 3). The participants' symptom domain scores ranged from 9 to 37 with a modal value of 12 while the environment domain ranged from 8 to 36 with a modal value of 28. More than 10% of the respondents experienced limitations (complete problem) in four of the six components of activity and participation domains of the ICF brief core sets for VR. These components were remunerative employment (21.4%), acquiring new skills (17.1%), non-remunerative employment (16.7%), as well as

acquiring, keeping and terminating jobs (14.3%). Similarly, a larger proportion (44.7%) of the participants indicated that they had moderate to severe problems with handling stress and psychosocial demands and two components of the body function domains; energy and drive functions (41.9%) and higher level cognitive function (36.2%). Performing complex interpersonal relationships (68.6%) and exercise tolerance function (64.3%) were identified as resulting in no or little problem by more than 60% of the participants while returning to work (Table 4).

In addition to impairments, activity limitation and participation restriction, the participants reported on the influence of environmental factors on their RTW. Over 10% of respondents indicated that labour services, system and policies was a substantial barrier to their RTW while health services, systems and policies (22.4%) was revealed by participants to be a major facilitator of their RTW. The participants' immediate family was indicated by more than 85% of participants as neither a barrier nor facilitator to their worker role. There was a significant difference in the impairments ($p < 0.001$), activity and participation restriction score ($p < 0.001$) between stroke survivors who returned to work and those who did not RTW (Table 4). Furthermore, the affected side, type of VR program, symptom, environment, activity and participation problem as well as body function impairments were the health related factors for RTW. The strongest

Table 2. Return to work status of participants.

Variable	<i>n</i>	%
Return to work status		
Yes	134	63.8
No	76	36.2
Current work status (<i>n</i> = 134)		
Full time	69	51.5
Part time	35	26.1
Modified/Light duty	30	22.4
Reason for not returning to work (<i>n</i> = 76)		
Not working due to health	45	59.2
Not working due to ongoing VR	20	26.3
Not working due to other reason	11	14.5

Table 3. Frequency distribution of participants answers to WIQ, *n* = 210 (100%).

Variable	Not at all	A little	Moderate	Quite a bit	Extreme	Mean RTW status		<i>F</i>	<i>t</i>	<i>p</i> value
						No	Yes			
Symptom scale						19.55 ± 4.8	15.21 ± 4.3	1.09	6.68	0.001*
Concentration	122 (58.1)	47 (22.4)	23 (11.0)	17 (8.1)	1 (0.5)					
Memory	119 (59.2)	51 (25.4)	20 (10.0)	10 (5.0)	1 (0.5)					
Speech	110 (52.4)	36 (17.1)	44 (21.0)	13 (6.2)	7 (3.3)					
Swallowing	183 (87.1)	11 (5.2)	14 (6.7)	1 (0.5)	1 (0.5)					
Visual problems	142 (67.6)	30 (14.3)	23 (11.0)	12 (5.7)	3 (1.4)					
Coordination	63 (30.0)	53 (25.2)	66 (31.4)	23 (11.0)	5 (2.4)					
Mood	128 (61.0)	47 (22.4)	25 (11.9)	7 (3.3)	3 (1.4)					
Pain	54 (25.7)	58 (27.6)	57 (27.1)	32 (15.2)	9 (4.3)					
Fatigue	50 (23.8)	79 (37.6)	53 (25.2)	16 (7.6)	12 (5.7)					
Environment Scale						25.41 ± 6.4	19.04 ± 5.9	0.37	7.25	0.001*
Walking difficulties	23 (11.0)	46 (21.9)	74 (35.2)	42 (20.0)	25 (11.9)					
Balance	33 (15.7)	56 (26.7)	70 (33.3)	37 (17.6)	14 (6.7)					
Access at work	55 (26.2)	25 (11.9)	39 (18.6)	37 (17.6)	54 (25.7)					
Travel to work	52 (24.8)	20 (9.5)	46 (21.9)	36 (17.1)	56 (26.7)					
Weakness	36 (17.1)	50 (23.8)	81 (38.6)	32 (15.2)	11 (5.2)					
Public attitudes	70 (33.3)	19 (9.0)	44 (21.0)	32 (15.2)	45 (21.4)					
Handwriting	97 (46.2)	16 (7.6)	21 (10.0)	30 (14.3)	46 (21.9)					
Continence	162 (77.1)	20 (9.5)	26 (12.4)	1 (0.5)	1 (0.5)					
WIQ total						44.96 ± 9.2	34.25 ± 8.7	0.01	8.36	0.001*

WIQ: work impact questionnaire.

*Statistically significant at $p < 0.05$.

Table 4. Summary of impairment, activity limitation and participation restriction experienced by participants during return to work.

ICF domains	No	Mild	Moderate	Severe	Complete	Mean RTW status		F	T	p value
						No	Yes			
Activity and participation						11.94 ± 6.4	6.58 ± 5.7	2.14	6.27	0.001*
Acquiring skills	61 (29.0)	44 (21.0)	46 (21.9)	23 (11.0)	36 (17.1)					
Handling stress and psycho demands	62 (29.5)	49 (23.3)	75 (35.7)	19 (9.0)	5 (2.4)					
Complex interpersonal relationship	93 (44.3)	51 (24.3)	49 (23.3)	13 (6.2)	4 (1.9)					
Acquiring, keeping and terminating job	76 (36.2)	38 (18.1)	29 (13.8)	37 (17.6)	30 (14.3)					
Remunerative employment	84 (40.0)	26 (12.4)	38 (18.1)	17 (8.1)	45 (21.4)					
Non-remunerative employment	84 (41.4)	32 (15.2)	38 (18.1)	18 (8.6)	35 (16.7)					
Body function and structure						4.81 ± 2.7	2.92 ± 2.5	0.42	5.06	0.001*
Energy and drive function	68 (32.4)	39 (18.6)	68 (32.4)	20 (9.5)	15 (7.1)					
Higher level cognitive function	77 (36.7)	50 (23.8)	63 (30.0)	13 (6.2)	7 (3.3)					
Exercise tolerance function	85 (40.5)	50 (23.8)	60 (28.6)	10 (4.8)	5 (2.4)					
Environment						-0.20 ± 2.9	-0.73 ± 1.8	3.32	1.66	0.098
Total core set score						16.56 ± 9.3	8.78 ± 6.7	10.83	7.00	0.001*

RTW: return to work.

*Statistically significant at $p < 0.05$.

predictor of RTW was the side of stroke affectation (OR = 7.63; Table 5).

Discussion

The results showed a RTW rate of 63.9% for the stroke survivors. This rate aligns with findings from the study conducted by Endo et al. (2016) among Japanese stroke survivors. On the other hand, the rate is slightly higher than that reported by Peters et al. (2013) who revealed a 55% RTW rate for stroke survivors in North Eastern Region of Nigeria. The difference in rates reported from this study as compared with that of Peters et al. (2013) could be as a result of insurgency and unrest experienced in the North-East Region where the latter study was conducted. This is further reflected in the general household survey that reported a 4.2% reduction in unemployment rate in Osun state as compared with 16.6% increase in unemployment rate in Borno state over a five-year period (National Bureau of Statistics, 2018). Evidently, there would be a wide gap between the rehabilitation resources available in Osun state (the current study setting) when compared to the North East region of Nigeria as rightly noted in a study conducted by Eleyinde et al. (2018). The foregoing might have contributed to the higher rate of RTW as observed in the present study. Meanwhile, a larger percentage of the stroke survivors in this study were married. These might have contributed to the higher RTW rates observed in this study. Previous studies have already found out the influence of demographic characteristics on RTW after stroke (Busch et al., 2009; Fukuzawa et al., 2018; Vestling et al., 2003). The support received by the stroke survivors from their spouse could have facilitated the attainment

of the required level of occupational performance and independence for RTW. Likewise, the need to meet up with financial obligations especially among survivors who were married might motivate the stroke survivor to RTW. As most of the stroke survivors were engaged in jobs that required light to medium level of energy exertion, securing and retaining employment after stroke in occupations that require minimal energy level for work task completion have been asserted to be easier when compared with work tasks that require heavy level of energy exertion. Also, the slightly higher percentage of RTW rate in this study when compared with the study of Peters et al. (2013) may be explained by the stroke sequelae that the stroke survivors experienced. Less than a third of the stroke survivors in this present study experienced moderate to extreme difficulties with concentration, memory, communication, vision, mobility and balance. It is equally of interest that a large proportion of the stroke survivors in this study returned to self-employment. Limited opportunities within the Nigerian labour market as well as absence of social security may have encouraged the stroke survivors to become self-employed.

Baldwin and Brusco (2011) reported a RTW rate ranging from 12% to 49% in their systematic review of the effect of vocational interventions on RTW rates post-stroke while van der Kemp et al. (2019) indicated a RTW rate of 71.9% in the Restore4Stroke cohort after one year. The gaps observed in rates may be linked with various definitions of work (status) reported by authors. The present study considered all forms of employment (either as full-time or part-time) in arriving at the RTW rates, with 32.9% returning to work full-time while 31.0% returning to either part-time or modified work. It could be assumed that

Table 5. Predictors of return to work ($n = 210$).

Variable	B	Ward	df	Unadjusted OR	p value	95% CI for OR	
						Lower	Upper
Marital status							
Never married (single)	3.10	3	1		0.377		
Married	0.08	0.01	1	1.08	0.948	0.92	12.86
Divorced	-0.34	0.07	1	0.71	0.786	0.05	9.55
Widowed	-1.64	1.46	1	0.19	0.228	0.01	2.79
Disability level							
(No symptom)	3.06	5	1		0.690		
No significant disability	2.67	0.41	1	14.50	0.524	0.01	53666
Slight disability	2.88	0.47	1	17.81	0.490	0.01	63946
Moderate disability	1.99	0.23	1	7.30	0.634	0.01	26112
Moderate severe disability	3.28	0.57	1	26.52	0.452	0.01	134969
Severe disability	6.12	0.45	1	454.25	0.500	0.00	0.01
Hemiplegia/hemiparesis							
(Dominant)	8.99	1	1				
Non-dominant	2.03	8.99	1	7.64	0.003*	2.02	28.84
VR programme							
(Engaging in voc training)	21.34	3	1				
Preparatory activities for employment	-4.48	13.48	1	0.01	0.000*	0.01	0.12
Act to secure or maintain job	0.24	0.096	1	1.28	0.758	0.27	6.02
Looking for new job	-2.91	9.61	1	0.05	0.002*	0.09	0.34
WIQ							
WIQ-symptom subscale	-0.14	5.18	1	0.87	0.023*	0.77	0.98
WIQ-environment subscale	-0.19	7.26	1	0.83	0.007*	0.73	0.95
ICF brief core sets							
Activity and participation	-0.15	7.11	1	0.86	0.008*	0.77	0.96
Body function and structure	-0.22	4.17	1	0.80	0.041*	0.65	0.99

VR: vocational rehabilitation; WIQ: work impact questionnaire; ICF: International Classification of Functioning, Disability, and Health.

*p value is significant at $p \leq 0.05$.

these RTW rates are comparable with the findings of Baldwin and Brusco (2011).

Specifically, the results pertaining to symptoms that commonly affect survivor's work ability showed that problem arising from pain, coordination and fatigue mostly prevent survivors from resuming work. This finding is consistent with the studies of Andrew et al. (2014); Balasooriya-Smeekens et al. (2016); and Hartke et al. (2011). Although, most of these psychological symptoms such as pain and fatigue appear invisible to employer or co-workers, it however greatly impact on survivor's work ability and was classified as unmet needs by Andrew et al. (2014). The difficulty experienced by survivors in concentration, memory, visual problem and mood had no or little impact on RTW. This is contrary to findings from previous literature that reported that cognitive sequelae of stroke severely limit task performance and RTW following stroke (Balasooriya-Smeekens et al., 2016). It could be expected that rehabilitation interventions such as occupational therapy and physiotherapy received by the stroke survivors helped to reduced the sequelae of stroke that could have affected their work ability.

Even though survivors might have experienced these symptoms during task performance, the different coping and adaptive strategies acquired during rehabilitation might have limited its impact as all survivors in this study received one or more forms of rehabilitation service. Conversely, travel to work, access at work, handwriting, public attitudes and walking difficulty severely impacted on the work ability of the survivors. This is consistent with the findings of a qualitative study that explored the experiences of stroke survivors in south-west Nigeria (Soeker & Olaoye, 2017). The authors revealed that environmental factors which include society's attitude towards disability in the form of stigma, accessibility of the physical work environment as well as transportation systems are major barriers to RTW among stroke survivors in south-west Nigeria. This result raises an important awareness that discriminatory practices which prevent inclusion and participation of people with disability in the society is still on the increase and that environmental specific impact that addresses stigma, workplace barriers should be noted as change initiatives that is needed in RTW programme content and implementation.

This study further showed that duration of post-stroke survival was longer among stroke survivors who returned to work as compared to those who did not. Peters et al. (2013) reported similar findings while previous prospective studies (Saeki & Toyonaga, 2010) revealed a higher chance of RTW in the first year after stroke. The longer period it took survivors from this current study to RTW could be ascribed to the paucity of specialised sub-acute and long-term rehabilitation centres in Africa (Agho & John, 2017; Peters et al., 2013; Wylie et al., 2016) as compared to other continents (Cameron et al., 2016; McCluskey et al., 2015) where stroke survivors are being provided intensive therapy services on in-patient basis upon discharge from the hospitals.

Stroke survivors who returned to work experienced a lower impact of symptoms on work ability, as well as lesser impairments, less activity limitation and participation restriction as compared to those who did not RTW. This is consistent with previous literature evidence regarding factors that influence RTW among stroke survivors (Wang et al., 2014). The more severe the difficulty experienced in activity performance and participation capacity as a result of stroke, the more difficult it becomes for a survivor to resume pre-morbid societal roles such as work. The implication for intervention is that RTW programmes that effectively teach coping skills, address impairments, activity limitation and participation restriction arising from stroke is imperative. The baseline data from the present study underscore the need for integrative programmes that address the multi-faceted nature of difficulties experienced by survivors when returning to work as suggested by Soeker and Olaoye (2017).

Logistic regression analyses indicated that clinical characteristics of survivors and environmental factors were important in facilitating RTW after stroke. In particular, hemiplegia of the dominant side, type of rehabilitation program, stroke symptoms and environmental factors, activity limitation and participation restriction experienced by survivors significantly explained the variance in RTW of survivors. These findings are consistent with the report of the systematic review conducted by Wang et al. (2014). In the present study, side of stroke affectation was the most important determinant of stroke RTW. Stroke survivors with left side hemiplegia had a 7.6 times likelihood to RTW than their counterparts with right side hemiplegia. This is consistent with the study of Ntsiea et al. (2015) who report a 7.7 odd ratio for stroke survivors with left side stroke hemiplegia. Although, the current study did not check for hand dominance, literature evidence revealed the frequency of right side laterisation in any given population to range from 74% and 96% (Michel et al., 2013) and 94% among stroke survivors

(Duff et al., 2014). It could therefore be expected that majority of the stroke survivors in the study are right hand dominant which made them better placed to RTW compared with their counterparts as posited by Hamzat et al. (2014). The disability imposed by stroke places a restriction on the functional use of the dominant hand for survivors with right side hemiplegia. Thus, stroke survivors with left side hemiplegia had a higher participation and a better re-integration into their worker role than their counterparts. Similarly, as individuals with right side stroke hemiplegia have a greater tendency of having their Broca area affected thereby leading to expressive aphasia, it may be adduced that speech problem coupled with hemispheric laterisation (right hand dominance) of stroke was responsible for the high likelihood to RTW by this group of stroke survivors.

Limitations

The use of a cross-sectional survey could have influenced the predictor power of independent variables on RTW of the stroke survivor. A longitudinal survey is therefore recommended to address this limitation in future studies. Also, the major outcome measure of this study is mainly self-reported. Caution should be exercised in generalising the findings as there may be some bias in terms of the responses provided by the stroke survivors.

Conclusion

The results from this cross-sectional survey highlighted that RTW of stroke survivors is relatively higher as compared with previous studies from developing countries. However, a high proportion of stroke survivors returned to self-employment. Furthermore, the result established that side of stroke affectation, type of rehabilitation programme, stroke symptoms, environmental factors as well as problems experienced by survivors in activity and participation significantly predict RTW. The implication for programme development is that these variables must be included as part of an integrative programme for RTW.

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