

RESEARCH ARTICLE

Readiness to work after six months post-stroke in Subang Jaya

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Abstract:

The low rate of return to work (RTW) among stroke survivors despite receiving rehabilitation treatment has been documented in few previous studies. This study aims to identify the relationship between demographic profiles and readiness to return to work and also to determine stages of employment readiness to return to work of post-stroke patients after 6 months of intervention. A total of 61 participants of post-stroke patients recruited from five private centers in Subang Jaya participated in the survey with a mean age of 47.57 (SD=5.74), ranging from 36 years old to 55 years old. The LAM Assessment of Stages of Employment Readiness (LASER) is chosen as the main instrument in this study. Chi-square was used to analyze the relationship between demographic data and stages of readiness. Meanwhile, descriptive statistics was used to determine the stages of readiness after 6 months post-stroke. The result showed that the demographic characteristics of gender, marital status, being the sole income of the family, type of stroke, stage of stroke, changes in salary after stroke, age, duration of stroke and duration of therapy received had no significant difference with stages of employment readiness. This study also found that most of the participants are in the pre-contemplation stage (37.7%, n=23) where they might not be ready to return to work yet, followed by the contemplation stage (34.4%, n=21) and lastly, the action stage (27.9%, n=17). In conclusion, health care professions such as occupational therapy should emphasize personalized strategies to address psychosocial barriers, as most stroke survivors remain in early stages of readiness to return to work post-rehabilitation.

Keywords: *post-stroke, readiness to work, return to work (RTW), stroke*

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1. INTRODUCTION

In 2019, Powers et al. redefined the definition of stroke based on neuropathological, neuroimaging, and/or clinical evidence of long-term damage. Central nervous system infarction is defined as brain, spinal cord, or retinal cell death associated to ischemia. There are two types of strokes which are ischemic stroke and haemorrhagic stroke. Ischemic stroke specifically refers to central nervous system infarction accompanied by overt symptoms, whereas silent infarction results in idiopathy. Central nervous system infarction occurs across a clinical range. Subarachnoid haemorrhage and intracerebral haemorrhage are likewise generally considered to be stroked (Sacco et al., 2013). Cerebrovascular disease which is another name for stroke is the second most common cause of years lived with a disability worldwide. More than 15 million people worldwide experience the devastating and disabling effects of stroke each year and the spectrum of disability is broad (Roy-O'Reilly & McCullough, 2018). In Malaysia, stroke has become a prominent public health concern, ranking as the third leading cause of death. Disturbingly, statistics from 2019 reveal that there were 47,911 stroke incidents, resulting in 19,928 fatalities, 443,995 prevalent cases, and

512,726 lost Disability-adjusted life years (DALYs) due to stroke (Tan and Venketasubramanian, 2022).

It is noteworthy that strokes are not limited to the elderly population, as young adults between the ages of 18 and 49 account for a significant portion (10% to 15%) of all stroke cases (Ekker et al., 2019). Recent studies indicate an increased proportion of stroke patients among younger individuals aged 35 to 44 and 55 to 64, while the number of stroke patients in the 65 to 74 age group has been declining (Hwong et al., 2021). Furthermore, return to work (RTW) rates vary among stroke patients, with different types of strokes exhibiting distinct patterns. Previous study shows that individuals who experienced cerebral infarctions displayed higher RTW rates compared to those with cerebral haemorrhages, indicating the influence of stroke type on employment outcomes (Elloker & Rhoda, 2018).

A study by Schwarz et al. (2017) stated that the rate of post-stroke to RTW is low despite receiving rehabilitation treatment. This statement is supported by a study by Walters et al. (2020) which found most working-age stroke survivors accepted rehabilitation treatments within the first three months, failed to return to work after a year and most reported

low mood and poor quality of life (QoL). On the other hand, a study by Wan Abdullah et al. (2022) found that the RTW rate among injured employees is relatively high, at 60%. However, the study is not specified on the disease, but general musculoskeletal problems and pain caused by their job. However, little research has been conducted specifically on post-stroke employees' readiness to return to work, highlighting the need for further investigation in this area (Wan Abdullah et al., 2022).

This study aims to investigate the stages of employment readiness for RTW in post-stroke patients after six months of intervention, with a particular focus on selected private centers in Subang Jaya. By identifying the relationship between demographic profiles and readiness to return to work, valuable preliminary results can be gained to facilitate successful RTW programs and enhance the overall quality of life for post-stroke individuals.

2. MATERIALS AND METHODS

This was a cross-sectional study where data on the demographic characteristics of a population under study is obtained and analyzed at the same time over certain point in time.

A total of 61 post-stroke survivors from 5 selected private centers within Subang Jaya who agreed and met the inclusion criteria participated in this research study. The inclusion criteria include participants must have undergone treatment or intervention for at least 6 months. Participants must be able to read and understand English well as the questionnaires is only available in English. For the exclusion criteria, the participants who have retired or were unemployed before being diagnosed with stroke are excluded from this study.

There are two sections in the questionnaire forms that the participants must fill in and answered. Section A contains demographic characteristics of the participants which includes age, gender, marital status, the status of sole income of the family, type of stroke diagnosed, stage of stroke, duration of stroke and duration of therapy received.

Section B was the standardized instrument which is LAM Assessment of Stages of Employment Readiness (LASER). The LASER developed by Lam et al. (2010) is to assess a person's psychological readiness to return to work after extended joblessness due in part or entirely by disability. The highest total score in the stages indicates the individual's stage of employment readiness. There are three stages of employment readiness which are Pre-Contemplation, Contemplation and Action Stages. Lam et al. (2010) have explained that in the Pre- Contemplation stage, it is likely most of the time, they don't plan to work anytime soon, for Contemplation Stage, people are aware of the issue and considering the possibilities of change at this point, but they have not yet decided to change meanwhile in Action Stage

they have started acting in ways that indicate they are looking for work, and many of the obstacles to doing so have been eliminated. LASER has utilized 5-point Likert scales which are Strongly Agree, Disagree, Undecided, Agree and Strongly agree. The participants need to choose one of these scales based on how they feel according to the statement.

The data gained from the questionnaires were analyzed by using statistical analysis of the IBM Statistical Package for the Social Sciences (SPSS) Statistics 29 software. Chi-square test was used to identify the relationship between all demographic data and stages of readiness. Kruskal-Wallis test was used to identify the relationship between numerical data of demographic data which is age, duration of stroke and duration of therapy received with stages of readiness to RTW. Descriptive data was used to identify the percentage of stages of readiness of post-stroke patients after 6 months in Subang Jaya.

3. RESULTS

A total of 61 participants who met the inclusion criteria completed the questionnaires. The demographic characteristics of 6-month post-stroke patients are shown in Table 1. Most of the participants were male (59%, n=36), with a mean age of 47.57 (SD=5.74, ranging from 36 to 55) years. Most of the participants are married (86.9%, n=53), followed by single (9.8%, n=6) and divorced (3.3%, n=2). For the stage of stroke diagnosed, the majority is in mild stroke (65.6%, n=40), followed by moderate stroke (26.2%, n=40) and severe stroke (8.2%, n=5). Majority (82%, n=50) is the sole breadwinner of the family. Most participants had ischemic stroke (82%, n=50) followed by haemorrhage stroke (18%, n=11). Most of the participants were diagnosed with mild strokes (65.6%, n=40), followed by moderate stroke (26.2%, n=16) and minority is in severe stroke (8.2%, n=5). For the changes of salary received before and after stroke, majority of participants underwent no changes (54.1%, n=33), followed by lessen compared to before stroke (29.5%, n=18) and lastly not received any salary or unemployed (16.4%, n=10).

Table 1 Demographic characteristics of the participants (n=61)

Characteristic	Frequency (n)	Percentage (%)
Gender		
Female	25	41.0
Male	36	59.0
Marital status		
Married	53	86.9
Divorced	2	3.3
Single	6	9.8
Sole income		
Yes	50	82.0
No	11	18.0
Type of stroke		
Ischemic stroke	50	82.0

Hemorrhage stroke	11	18.0
Stage of stroke		
Mild	40	65.6
Moderate	16	26.2
Severe	5	8.2
Salary before and after stroke		
Lessen	18	29.5
No change	33	54.1
No salary	10	16.4
	Median	IQR
Age	48.00	9
Duration of stroke	2.00	2
Duration of therapy received	1.00	2

3.1. Readiness to Work after 6 months post-stroke

Based on the LASER assessment, the calculation of the score for the three stages of readiness which are pre-contemplation, contemplation and action stages is done. The result showed that most of the participants are in the pre-contemplation stage (37.7%, n=23), followed by the contemplation stage (34.4%, n=21) and lastly, the action stage (27.9%, n=17) as illustrated in Figure 1.

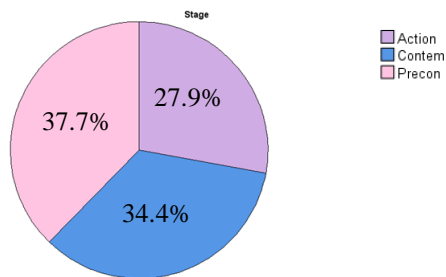


Figure 1. Stages of readiness to Work after 6 months post-stroke

3.2 Association between demographic characteristics with stages of readiness to work after 6 months post-stroke

Table 2 presents the association between various demographic characteristics and the stages of readiness to work (Pre-contemplation, Contemplation and Action Stages) six months post-stroke. Results show that gender across the stages of RTW did not show a significant association ($\chi^2(2) = 0.745, p = 0.69$), same goes with marital status ($\chi^2(4) = 1.445, p = 0.84$), Income ($\chi^2(2) = 5.135, p = 0.08$), type of stroke ($\chi^2(6) = 5.552, p = 0.48$), stage of stroke ($\chi^2(4) = 3.53, p = 0.47$) and salary change ($\chi^2(4) = 2.032, p = 0.73$). These suggested that demographic characteristic of the participants in this study do not have a statically significant association with the stages of

readiness to work.

Table 2 Association between demographic characteristics with stages of readiness to work

Variables	Stages of RTW n (%)			X ² (df)	P-Value
	Pre	Cont	Action		
Gender					
Male	12 (52.2)	13 (61.9)	11 (64.7)	0.74	0.69
Female	11 (47.8)	8 (38.1)	6(35.3)	5 (2)	
Marital Status					
Married	19 (82.6)	18(85.7)	16(94.1)	1.44	0.84
Divorced	1(4.3)	1(4.8)	-	5	
Single	3(3)	2(9.5)	1(5.9)	4	
Sole Income					
Yes	21 (91.3)	14(66.7)	15(88.2)	5.13	0.08
No	2(8.7)	7(33.3)	2(11.8)	5 (2)	
Type of Stroke					
Ischemic	20(87.0)	16(76.2)	14(82.4)	5.55	0.48
Haemorrhage	3(13.0)	5(23.8)	2(17.6)	2 (6)	
Stage of Stroke					
Mild	15(65.2)	15(71.4)	10(58.8)	3.53	0.47
Moderate	7(30.4)	3(14.3)	6(35.3)	4	
Severe	1(4.3)	3(14.3)	1(5.9)	4	
Salary					
No Change	10(30.3)	13(39.4)	10(30.3)	2.03	0.73
Lessen	9(50.0)	5(27.8)	4(22.2)	2 (4)	
No Salary	4(40.0)	3(30.0)	3(30.0)	4	

For numerical data which are age, duration of stroke and duration of therapy received, the Kruskal-Wallis test was conducted where the median (IQR) for age is [48(9), p=0.17], meanwhile, the duration of stroke is [2.0(2), p=0.12] and duration of therapy received is [1.0(2), p=0.29]. The results indicate no significant differences in age, duration of stroke, and duration of therapy received among different stages of readiness to work.

Table 3 Association between demographic background (age, duration of stroke and duration of therapy received) with stages of readiness to work

Variable	Stage of Readiness to Work, n			Median (IQR)	X ² (df)	P-value
	Pre-contemplation	Contemplation	Action			
Age	23	21	17	48(9)	3.50 (2)	0.17
Duration of stroke (year)	23	21	17	2.0(2)	4.17 (2)	0.12
Duration of therapy received (year)	23	21	17	1.0(2)	2.47 (2)	0.29

3. DISCUSSION

The current study found that most of the participants are in the pre-contemplation stage followed by the contemplation stage and lastly, the action stage. These results are consistent with Wan Abdullah et al. (2021) study, which also found that pre-contemplation was the predominant stage for most post-stroke patients. This might have come about because they failed to know the importance of rehabilitation for stroke recovery. Participants selected the pre-contemplation stage which signifies that early-stage preparation is important in post-stroke rehabilitation.

The current study found that among post-stroke patients, gender is not a significant factor in predicting the stages of readiness to work. There are limited studies comparing gender and stages of employment readiness, however, most of the previous studies related to gender and the possibility of RTW. Fukuzawa et al. (2018) examination of return to work among patients with chronic stroke reported no significant change in the sex ratio toward re-employment. The finding is supported by this study where it was also found that female and male gender have similar return-to-work rates in stroke survivors. Gender differences may thus not have significant impact on employment readiness after stroke, as suggested by these results. As opposed to Palstam et al. (2019), who noticed that being a man was associated with quicker and more frequent RTW, this research failed to find any notable differences between men and women’s RTW rates. In addition, Palstam et al. (2019) have also shown that among males qualified occupation predicted shorter time to RTW but not in women.

In all readiness levels, the percentages of married, single, and

divorced people were similar. This suggests that marital status does not significantly influence returning to work among post-stroke patients. This finding is in contrast with previous research by Schulz et al. (2018) that found the rates of married stroke survivors returning to work are low. In addition, a systematic review found that women, particularly married women, often face more challenges in reintegrating into society following a stroke than males do potentially because of women’s differing societal positions and duties (Edwards et al., 2017).

This current study shows that being the sole breadwinner of family does not significantly influence readiness to work. The result is contradicted with a study by Teo et al. (2022) who found that being the breadwinner is positively associated with long-term return to work for stroke patients involved in early supported discharge program. The study highlighted that patients are immensely motivated to overcome their disability and restore their employment capacity because of financial and caregiving duties.

The current study also suggests that the type of stroke does not significantly impact a patient’s readiness to return to work. Both ischemic and haemorrhagic stroke patients exhibited similar distributions across the readiness stages. However, a study by Chen et al. (2019) found that individuals who have a cerebral infarction had greater chances to return to work and back to work faster. The research also added that patients with a cerebral infarction had a greater probability of continuing back to work 4 weeks after therapy than those with a cerebral hemorrhage.

Additionally, patients with mild, moderate, and severe strokes showed similar readiness to return to work in this current study. This result is different from a study by Ashley et al. (2019), which found returning to work for stroke survivors is predicted by mild to moderate strokes and is associated with a higher likelihood of stroke survivors returning to their jobs. Additionally, Cain et al. (2022) and Wipahut et al. (2023) discovered similar findings that acute stroke severity and disability levels at three months post-stroke independently predict the likelihood of returning to work after 12 months and within three months of discharge respectively. These findings emphasize the need of early intervention and tailored rehabilitation in improving employment prospects for stroke patients.

The distribution of participants’ salaries across the readiness stages was similar regardless of whether they had a pay increase, decrease, or no change. This shows that the preparedness to return to work is not greatly impacted by changes in finances after a stroke. Financial factors may have less of an impact on an individual’s readiness to work than the effects of a stroke on one’s own health and functional abilities. A similar conclusion was reported in a New Zealand study by Aarnio et al. (2018) which found that within a year of a stroke, median personal income falls by up to 60%, with larger

decreases for individuals with higher initial wages and those who do not return to work. More research is needed to determine the particular causes of these social class variations in return to work.

Next, no significant difference in median age among the different stages of readiness to work. The result contradicts with that of Westerlind et al. (2019) who found that a successful return to work after a stroke can be predicted by criteria such as younger age. It's because people who are younger tend to be more independent in their daily lives, have fewer neurological disorders, and recover better cognitively after a stroke. Also, Morsund et al. (2020) study revealed that high age was the highest predictor of unemployment at 12 months follow up among those individuals who were employed at baseline. Additionally, Pan et al. (2023) indicated that people between ages 40 years and 50 years were not likely reluctant to working unlike those aged above 50 years old. This could be because of middle-aged individuals in this age group having to provide financial assistance for both their parents and their kids.

The current study found that stroke duration with stages of employment readiness has no significant difference. According to Edwards et al. (2017), RTW rates after a stroke show an upward trajectory over the first few years post-stroke, with median rates of 41% at 0–6 months, 53% at one year, and moves up even more until reaching about 56%-66%, between 1.5-4 years. This indicates that, as time since the stroke increases, so does the probability of a return to work. As supported by Radford et al. (2020) who discovered that 63% of participants went back to work within a year, with a mean 90-day recovery period. Despite this, long-term data indicate a decrease in RTW rates over longer periods, which means stroke victims may face certain challenges.

According to the finding of this study, there was no significant difference in the median duration of therapy received among the different stages of readiness to work ($p = 0.29$). This aligns with the study by Ntaios et al. (2020), which showed that functional recovery and employment preparedness are more reliant on the kind and quality of therapy than its length. They stated that the importance lay in personalized targeted rehabilitation treatments tailored for specific needs and difficulties faced by stroke survivors. Apart from that, Westerlind et al. (2019) research revealed no statistically significant variation in the median stroke duration among the various stages of preparedness for work. This suggests that the amount of time that was spent after the stroke does not have a major impact on one's readiness to resume employment.

4. CONCLUSION

This study findings showed that the demographic characteristics such as age, gender, marital status, the status of sole income of the family, type of stroke diagnosed, stage of stroke, duration of stroke and duration of therapy received did not affect the stages of employment readiness to back to work.

The result also found that most of six months post-stroke patients were in pre-contemplation stage to return to work which also means that they were not ready to back to work soon.

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