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# The effect of a workplace intervention programme on return to work after stroke: A randomised controlled trial

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## Abstract

**Objective:** To determine the effect of a workplace intervention programme on the rate of return to work of previously employed stroke survivors in the Gauteng province of South Africa.

**Design:** A randomised controlled trial.

**Setting:** Participants' workplaces and three hospitals with stroke rehabilitation facilities.

**Subjects:** Eighty stroke survivors between the ages of 18 and 60 years who were employed at the time of stroke onset.

**Intervention:** The workplace intervention programme was tailored according to functional ability and workplace challenges of each stroke survivor. The control group received usual stroke care which took into consideration job requirements but without workplace intervention.

**Main outcomes:** The primary outcome was return to work rate. Secondary outcomes included activities of daily living (ADLs), mobility, basic cognitive function and perceived quality of life.

**Results:** At six months follow-up 60% ( $n = 24$ ) of stroke survivors in the intervention group returned to work compared to 20% ( $n = 8$ ) in the control group ( $P < 0.001$ ). The odds ratio for return to work for stroke survivors in the intervention group was 5.2. For every unit increase in the ADLs and cognitive assessment score, the odds of return to work increased by 1.7 and 1.3 respectively; those who returned to work had better quality of life than those who did not return to work ( $P = 0.05$ ).

**Conclusion:** A workplace intervention consisting of workability assessments and workplace visits was effective in facilitating return to work for stroke survivors in the Gauteng province of South Africa.

## Keywords

Stroke, return to work, activities of daily living, vocational rehabilitation, quality of life

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## Introduction

The rate of return to work for stroke survivors within the Gauteng province of South Africa (which comprises the largest share of the South African population)<sup>1</sup> up to two years after stroke is 34%.<sup>2</sup> Return to work reduces the devastation of unemployment which is closely linked with financial hardship and the inability to meet basic needs.<sup>3</sup>

Return to work interventions should ideally begin before disability benefits are introduced, as these may encourage dependency. Timing of the return to work intervention is also important because effectiveness of return to work programmes wane over time.<sup>4</sup>

Vocational retraining is not usually a feature of post-stroke rehabilitation<sup>5,6</sup> and emerging evidence suggests that a separate process is required to optimise return to work opportunities.<sup>3</sup> Research evidence suggests that the key features of vocational rehabilitation should include workability assessment,<sup>7</sup> work visits,<sup>8,9</sup> involvement of the employee, health professional and employer<sup>10</sup> and early intervention.<sup>11,12</sup>

At present there is very little research evaluating the effectiveness of vocational rehabilitation for people after stroke. Return to work programmes tend to be generic and include all sick listed employees,<sup>13</sup> whilst others include all people with disabilities who have either been on sick leave or are looking for a new job placement.<sup>14,15</sup> An associated problem is that therapists tend to focus more on disability grant assessments than workability assessments.<sup>3</sup> Research is required to identify effective interventions for return to work after stroke and features of vocational rehabilitation which may have broader generalisation. The primary aim of this study was to evaluate the effect of a workplace intervention programme on the rate of return to work of previously employed stroke survivors in Gauteng province of South Africa. Secondary aims were to determine the profile of the stroke survivors in relation to functional level (ADLs, mobility and global cognitive function) and perceived quality of life.

## Methods

A randomised controlled trial was conducted with follow-up assessments at three and six months.

Saeki and Toyonaga<sup>16</sup> and Vestling et al.<sup>17</sup> definitions of work were used as they include both part time and full time work, work done for payment, have no limitations on the amount of hours to be worked, cater for employees and employers, cater for those who had workplace adaptation and those who had a new job description to reasonably accommodate them after stroke.

## Participants

Stroke survivors who were employed at the time of having a stroke were recruited from 2009-2012 from three hospitals which offer stroke rehabilitation services within the Gauteng province of South Africa. Those who met the following criteria were included in this study: 1) aged between 18 and 60 years; 2) employed in the formal work sector at the time of stroke; 3) less than eight weeks since onset of stroke (in order to start the workplace intervention programme before the end of the six week sick leave period).<sup>18</sup>

Participants were excluded if they had a Barthel index score of less than 12 out of 20 indicating dependence in ADLs.<sup>19</sup> Participants were also excluded if they were involved in another workplace intervention programme at the time of the study, reported pre-morbid dependence in ADLs or were not willing to return to work after stroke. Some of the participants were outpatients and some were inpatients.

Participants were allocated consecutive numbers and then randomly allocated to either intervention or control group using an Excel computer programme generated randomisation list. There was no stratification. Concealment was ensured by having a research assistant not involved in the study, place allocations in sequentially numbered opaque envelopes without the researchers' involvement. Researchers who assessed outcomes at three and six months remained blinded to participant allocation throughout the study. Stroke survivors were not blinded to allocation.

*Primary outcome measure to establish the rate of return to work.* A return to work questionnaire was used to establish the rate of return to work at three and six month follow-up assessments. The

questionnaire was developed and validated for content, and reliability was established for all items on the questionnaire.<sup>2</sup> The questionnaire included a tick list to indicate whether stroke survivors returned to work (either pre-stroke employment or new employment), how long they had been back at work, if they intended to stay at work or resign, if adaptations were made to the working environment, and current financial role in the family. If they did not return to work, a list of possible reasons was provided for the stroke survivor to select from.

*Secondary outcome measures to establish the profile of study participants.* The Barthel index<sup>20</sup> and Modified Rivermead Mobility index<sup>21,22</sup> were used to measure ADLs and mobility respectively. The Montreal cognitive assessment was used to measure global cognition<sup>23,24</sup> and the Stroke Specific Quality of Life Scale<sup>25</sup> measured quality of life. All these outcome measures were administered at baseline and follow-up assessments at three and six months.

The following demographic characteristics of all stroke survivors in this study were determined: age; gender; marital status; side of hemiplegia; date of stroke; educational level; premorbid occupation; length of employment at current job; dependents; support from caregiver; co-morbidities; type of rehabilitation received; premorbid financial role in the family; monthly household income; sick leave duration; disability insurance and state disability grant.

*The intervention programme.* The workplace intervention programme was tailored according to the functional ability and workplace challenges of each stroke survivor and is presented in supplementary material Appendix A.

*Data analysis.* Rate of return to work was assessed by comparing the percentage of participants who returned to work with those who did not, using a two sample test of proportions.<sup>26</sup> A logistic regression was done to identify factors that had an influence on return to work, controlling for side of stroke, educational level, cognitive function, ADLs and mobility. These are variables which showed a statistically significant difference between the control and

intervention group even though the differences were not clinically significant. All statistical analyses were performed according to the intention to treat analysis. Per protocol analysis was used to establish if any protocol deviations had caused bias.

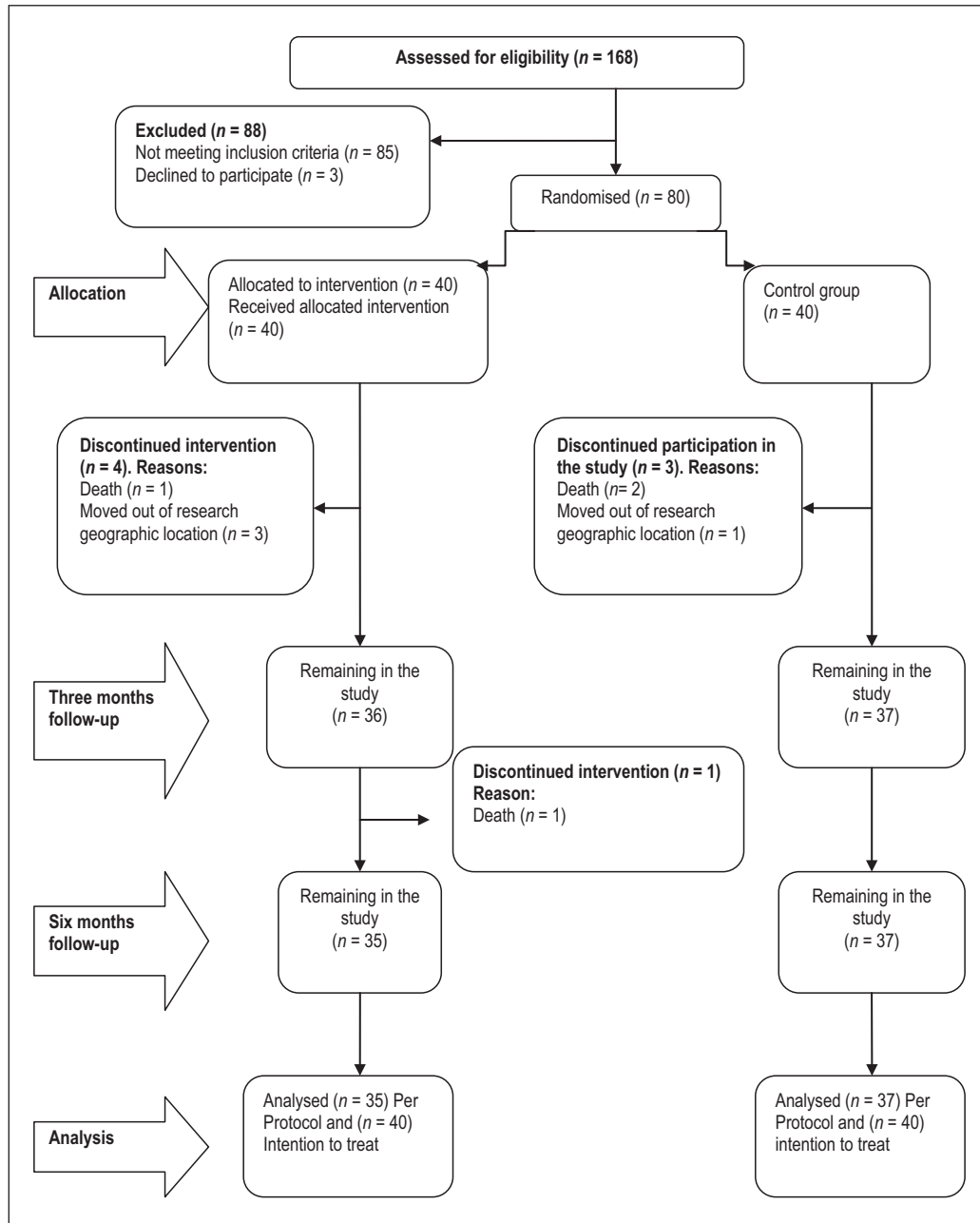
Descriptive summary statistics were used to compare baseline characteristics for both groups. For continuous variables that were normally distributed a two sample independent t-test was used. For non-normal distributions, Mann-Whitney U-test was used. Fisher's exact test was used to test the association between categorical variables for variables which had less than five observations per category; otherwise the Chi-squared test was used.

Sample size calculation was undertaken using both nQuery<sup>27</sup> and STATA 12 software programmes. Sample size calculations were based on the findings from Alaszewski et al. and Leng's return to work rates for stroke survivors which were 38% (returned to work) and 7% (did not return to work) respectively<sup>28,15</sup> and thus calculations for this study were based on an approximate minimum return to work rate of 38% for the experimental group compared with 7% for the control group. A two group continuity corrected Chi-square test with a 0.05 one-sided significance level had a 90% power to detect the difference between a Group 1 proportion ( $p_1$ ) of 0.38 and a Group 2 proportion ( $p_2$ ) of 0.07 (odds ratio of 0.123) when the sample size in each group is 40 (80 participants inflation for 15% possible dropouts). A  $P$  value  $\leq 0.05$  was considered statistically significant. STATA 12 software version 12.1 was used in data analysis.

## Results

### Participants

Eighty three stroke survivors, who fulfilled the inclusion criteria for the study, were invited to participate. Three declined participation, and 80 were accordingly screened. None of the stroke survivors who met the inclusion criteria and agreed to participate in the study were excluded. Reasons for exclusion included: Barthel index scores less than 12 out of 20 at eight weeks after stroke ( $n = 52$ ); planned to reside outside the Gauteng province after discharge from the hospital



**Figure 1.** Flow diagram for the study.

( $n = 24$ ); and were above the age of 60 years ( $n = 9$ ). Figure 1 shows the flow diagram for participants recruited for the study.

Demographic information of the stroke survivors is presented in Table 1. Differences between intervention and control group's demographic variables

**Table 1.** Demographic information of the stroke survivors ( $n = 80$ ).

	Total ( $n = 80$ )	Intervention group ( $n = 40$ )	Control group ( $n = 40$ )	<i>P</i> value
	Mean (SD)	Mean (SD)	Mean (SD)	
<b>Average age (years)<sup>a</sup></b>	45 (8.7)	45 (8.5)	44 (8.9)	0.47
Minimum and maximum age (years)		29 – 60	26 – 50	
<b>Average stroke duration (weeks)<sup>b</sup></b>	4.6 (1.8)	4.4 (1.9)	4.7 (1.5)	0.42
<b>Average number of financial dependants<sup>b</sup></b>	2.7 (1.8)	2.6 (2.6)	2.7 (1.7)	0.76
<b>Gender<sup>c</sup></b>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Male	41 (51)	21 (52)	20 (50)	
Female	39 (49)	19 (48)	20 (50)	0.82
<b>Marital status<sup>d</sup></b>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Single	16 (20)	8 (20)	8 (20)	
Divorced	3 (4)	3 (8)	0 (0)	
Live in Partner	15 (19)	10 (25)	5 (13)	0.16
Married	44 (55)	18 (45)	26 (65)	
Widow	2 (2)	1 (2)	1 (2)	
<b>Side of hemiplegia<sup>c</sup></b>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Left	39 (49)	24 (60)	15 (37)	
Right	41 (51)	16 (40)	25 (63)	0.04
<b>Educational level<sup>d</sup></b>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Degree	6 (7)	6 (15)	0 (0)	
Grade 12 + 3 years	16 (20)	7 (17)	9 (22)	
Grade 12 or equivalent*	24 (30)	15 (38)	9 (22)	
Grade 11	27 (34)	10 (25)	17 (43)	0.03
Grade 7 and below*	7 (9)	2 (5)	5 (13)	
<b>Financial role<sup>c</sup></b>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Breadwinner	50 (63)	25 (63)	25 (63)	
Contributing to family income	30 (37)	15 (37)	15 (37)	1.00
<b>Monthly income (Rands)<sup>d</sup></b>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
0 – 800	2 (2)	1 (2)	1 (2)	
801 – 2000	14 (18)	7 (18)	7 (18)	
2001 – 5000	27 (34)	8 (20)	19 (48)	0.03
More than 5000	37 (46)	24 (60)	13 (32)	
<b>Have helper at home<sup>d</sup></b>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
No	6 (7)	6 (15)	0 (0)	0.03
Yes	74 (93)	34 (85)	40 (100)	

SD: standard deviation; a: two sample t test; b: Mann-Whitney U-test; c: chi squared; d: Fisher's exact; \*Grade 7 is year 9 of school before high school, Grade 12 is year 14 of school before university or college.

were not statistically significant for age, stroke duration, gender, marital status, financial role, and having a paid helper. Between group differences for demographic information pertaining to side of hemiplegia, educational level, monthly income and having a helper at home were statistically significant.

Thirty nine percent ( $n = 31$ ) of study participants presented with speech problems, most commonly dysphasia (45%,  $n = 14$ ), however between-group differences were not significant ( $P = 0.19$ ). The most common co-morbidity in both the intervention and control group was hypertension (64%,

**Table 2.** Rate of RTW at three and six months after stroke and factors that influenced RTW rate after stroke.

Rate of RTW:	Three months follow-up			Six months follow-up	
	Intervention (n = 40)	Control (n = 40)		Intervention (n = 40)	Control (n = 40)
No return to work	n (%) 29 (73)	n (%) 35 (88)		n (%) 16 (40)	n (%) 32 (80)
Returned to work	<b>11 (27)</b>	<b>5 (12)</b>		<b>24 (60)</b>	<b>8 (20)</b>
	<b>P = 0.13</b>			<b>P &lt; 0.001</b>	
Total of those who RTW (n = 80)	n (%) 16 (20)			n (%) 32 (40)	
<b>Factors that influenced RTW:</b>	<b>OR</b>	<b>SE</b>	<b>z</b>	<b>P&gt; z </b>	<b>95% CI</b>
Intervention group	5.2	2.8	3.1	0.002	1.8 – 15.0
BI six month score	1.7	0.4	2.3	0.02	1.1 – 2.6
MoCA six month score	1.3	0.1	2.4	0.02	1.1 – 1.6
Left hemiplegia	4.4	2.3	2.8	0.005	1.5 – 12.5

OR: odds ratio; SE: standard error; CI: confidence interval. RTW: return to work; total of those who RTW = those who RTW in intervention + those who RTW in control group; BI: Barthel index; MoCA: Montreal cognitive assessment.

n = 51), followed by HIV related illness (29%, n = 23) diabetes (21%, n = 17), cardiac disease (9%, n = 7), arthritis (6%, n = 5) and high cholesterol (5%, n = 4). There was no evidence of significant differences between the two groups ( $P > 0.05$ ) with respect to co-morbidities.

The most common occupation in both the intervention and control group was that of administrator (34%, n = 27), followed by domestic worker/shop packer (23%, n = 19); however there were more blue (55%, n = 44) than white (45%, n = 36) collar occupations in total with no evidence of significant differences noted between groups. Occupations such as those with physically demanding standing and sitting activities, walking/running and driving were regarded as labour intensive work. Less physically demanding activities such as administrative standing, administrative sitting, and administrative talking were regarded as less labour intensive. Slightly more study participants (57%, n = 46) performed physically demanding work compared to those who did less physically demanding work (43%, n = 34), with no between group differences. The

mean (SD) years that stroke survivors in this study worked in their current job was 10.5 (8.6) and they had a mean sick leave duration of 7.2 (3.3) weeks.

### Rate of return to work

Results of the return to work rate for stroke survivors in the intervention and control group at three and six months are presented in Table 2. At six months, 60% (n = 24) of stroke survivors in the intervention group returned to work compared to 20% (n = 8) in the control group ( $P < 0.001$ ). The overall return to work rate was 20% (n = 16) at three months and 40% (n = 32) at six months.

The results of the intention to treat and per protocol analysis for the return to work differences between groups were the same at six months follow-up with  $P < 0.001$  for both intention to treat and per protocol analysis. This indicates that the protocol deviations that were accommodated in per protocol analysis did not cause bias in study outcome.



**Table 3.** Self-reported reasons for return to work and no return to work after stroke.

Reasons for no RTW (N = 32)	n (%)	Reasons for RTW (N = 31)	n (%)
Old employer would not offer the job	12 (37)	Finance	19 (61)
Expressive aphasia	5 (16)	Boredom	8 (26)
Upper limb dysfunction	4 (13)	Contact with colleagues	2 (6)
Inability to access transport	4 (13)	Enjoyment of work	2 (6)
Fatigue	3 (9)	Personal development	1 (3)
Difficulty walking	2 (6)	Motivation from family	1 (3)
Demotivation	2 (6)		
Depression	1 (3)		
Poor vision	1 (3)		
Poor cognition	1 (3)		
Fear of being bewitched by colleagues	1 (3)		
Poor memory	1 (3)		

RTW: return to work.

### *Factors that had an influence on return to work*

These results are shown in Table 2. Stroke survivors in the intervention group had 5.2 times greater odds of returning to work at six months follow-up than those in the control group. For every unit increase in the six month Barthel index and Montreal cognitive assessment score, the likelihood of return to work increased by 1.7 and 1.3 respectively. Post-hoc analysis was conducted to establish if the influence of side of hemiplegia on return to work was also associated with speech impairment. Stroke survivors with right hemiplegia were 7.1 times more likely to have speech problems than those with left hemiplegia ( $P < 0.001$ ; CI = 2.4 – 20.7).

The mean work duration at six months after stroke was more than eight weeks for both groups which indicates that most stroke survivors returned to work within four months of having stroke. For those that returned to work, the job description was changed for 55% ( $n = 17$ ) people and 23% ( $n = 7$ ) had work adaptations made. The majority (97%,  $n = 30$ ) returned to full time employment. Table 3 summarises the main reasons given by stroke survivors for returning or not returning to work.

### *Activities of daily living, mobility, cognitive function and quality of life*

Activities of daily living total scores generally increased over the study period for both groups (Table 4) and at six months follow-up the mean score for each group was above 19, which is the threshold indicating independence.<sup>29</sup> The differences in baseline and six months ADLs and functional mobility scores were significant with the intervention group scoring relatively higher than the control group. There was a significant difference in functional mobility and ADLs scores, with the intervention group having higher scores, however the mean change scores for these variables were higher for the control group. Most stroke survivors had mild cognitive impairments.<sup>23</sup> Quality of life scores increased over the study period with the intervention group scoring relatively higher. The differences in the quality of life mean scores between the intervention and control groups were not statistically significant, however in an analysis to compare stroke survivors who returned to work to those who did not return to work, those who returned to work had better quality of life than those who did not return to work at six months after stroke ( $P = 0.05$ ) (Table 5).



**Table 4.** Activities of daily living, mobility, cognitive function and quality of life.

	Baseline Assessment		Three months follow-up		Six months follow-up	
	Intervention (n = 40)	Control (n = 40)	Intervention (n = 36)	Control (n = 37)	Intervention (n = 35)	Control (n = 37)
<b>BI score /20</b>						
Mean (SD)	17.2 (2.6)	15.6 (2.8)	18.8 (1.6)	18.2 (2.2)	19.9 (0.1)	19.2 (0.3)
Mean change score (SE)*					2.9 (0.44)	3.6 (0.38)
Group comparison	<b>P = 0.01</b>		P = 0.32		<b>P = 0.001</b>	
<b>MRMI score /40</b>						
Mean (SD)	36.2 (4.9)	32.8 (6)	38.5 (2)	37.2 (3.5)	40 (0)	38.9 (1.7)
Mean change score (SE)*					4.2 (0.88)	6.03 (0.84)
Group comparison	<b>P = 0.02</b>		<b>P = 0.05</b>		<b>P &lt; 0.001</b>	
<b>MoCA score /30</b>						
Mean (SD)	23 (6.2)	21.1 (6.1)	24.3 (5.7)	23.5 (5.8)	25.8 (4.9)	24.7 (4.7)
Mean change score (SE)*					2.69 (0.7)	3.35 (0.6)
Group comparison	P = 0.16		P = 0.57		P = 0.33	
<b>SSQoL score /245</b>						
Mean (SD)	180.8 (30.5)	166.7 (37.7)	215.5 (19.8)	208.9 (27.1)	225.5 (18.1)	219.5 (24.3)
Mean change score (SE)*					44.3 (4.93)	51.8 (8.5)
Group comparison	P = 0.07		P = 0.24		P = 0.24	

\*Mean change score = the change in mean score from baseline to six months follow-up. SE = Standard error of the mean; BI = Barthel index; MRMI = Modified Rivermead Mobility index; MoCA = Montreal cognitive assessment; SSQoL = Stroke Specific Quality of Life

**Table 5.** Comparison of Stroke Specific Quality of Life total scores of stroke survivors who returned work and those who did not return to work at baseline (n = 80) and at six months follow-up (n = 72).

Variable	RTW	n (%)	Mean score	Mean difference	Standard error	95% CI	P value
Baseline (n = 80) <b>SSQoL out of 245</b>	No	48 (60)	171.1	6.6	8.1	-22.7 – 9.6	0.41
	Yes	32 (40)	177.7				
Six months (n = 72) <b>SSQoL out of 245</b>	No	41 (57)	218.2	9.7	5	-19.8 – 0.3	<b>0.05</b>
	Yes	31 (43)	227.9				

CI: confidence interval; mean difference: mean (yes, RTW) - mean (no, RTW).

## Discussion

To our knowledge this is the first study to report on the effects of an individualised return to work programme for stroke survivors in South Africa,

with three times as many participants in the intervention group employed at six months compared with the control group. The positive benefits of return to work indicate the need to increase exposure to vocational rehabilitation programmes. For

both groups, participants who returned to work had significantly better quality of life compared to those who did not return to work, confirming previous findings.<sup>5,6</sup>

The average time for return to work for the total group conforms to earlier research showing that most people, who return to work, do so within three to six months following stroke.<sup>30</sup> The return to work rate in Denmark was reported to be 62% two years after stroke. This high percentage could be due to their relatively longer follow-up duration and their definition of work which included house executives.<sup>31</sup> Hackett et al. reported a return to work rate of 75% in the year following stroke, mostly within three months.<sup>32</sup> This return to work rate is very high; however it cannot be compared with results of this study because they defined paid work as any type of work in the month before stroke, including casual or temporary, for one hour or more for which some form of payment was received.

The number of those who had their job description changed and work adaptations made in this study is relatively higher than the five percent reported by Hackett et al.<sup>32</sup> These differences could be due to the fact that only 2% of stroke survivors in Hackett et al.'s study received return to work intervention whereas in this study 50% received intervention. Most stroke survivors in the intervention group had work adaptations and job description changes following communication and contact between employer and therapist. The high number of changed job descriptions in this study is similar to that of Treger et al. who indicated that 58% of their stroke survivors had their job descriptions changed because of accommodative employers.<sup>30</sup>

The most common reason that stroke survivors offered for return to work was financial demands. This is not unique to our study. Lemieux et al. also reported that people may return to work prematurely because of financial pressure.<sup>33</sup> This is not surprising considering that most stroke survivors in our study were still below the age of 50 years and early retirement would result in lower pension because of the reduced number of working years in relation to retirement fund contributions. The majority of stroke survivors were breadwinners

and needed money to sustain their families. Hackett et al. showed that the odds of return to work for breadwinners were 88% higher than for those who were not breadwinners<sup>32</sup> and therefore supports the results of this study.

Despite finance, boredom was also mentioned as one of the main reasons for return to work by a number of stroke survivors. The fear of not knowing what to do at home all day can be a motivating factor for return to work<sup>28</sup> because staying at home may result in social isolation due to loss of the socialising effect at the workplace.<sup>33</sup> It would be reasonable to conclude that even if a stroke survivor did not have financial problems, they may want to return to work to avoid boredom and loss of their sense of self-worth and life satisfaction.<sup>17</sup>

The most common reason why stroke survivors in the current study did not return to work was that the old employer would not offer the job. The inability of stroke survivors to perform the job they were doing before the onset of stroke (especially in physically demanding occupations) or the inability to speak clearly (especially in occupations where communication was a priority) influenced stroke survivors' opportunities to return to work. Fatigue was also mentioned as a reason for not returning to work and this is not surprising as fatigue is known to be a problem after stroke.<sup>34</sup>

Stroke survivors in this study were independent in ADLs following stroke as a result of the inclusion criteria. Functional ability alone is therefore not an indication of whether people will return to work after stroke. This indicates that stroke survivors who have high scores on function should still be assessed for workability and assisted with the return to work process where possible.

The Barthel index total score and Modified Rivermead Mobility index scores were significantly different between groups, with the intervention group scoring relatively higher than the control group. However, differences were less than 4.5 points for Modified Rivermead Mobility index, which is not clinically significant<sup>35</sup> and both groups were categorised as functionally independent on the Barthel index.<sup>29</sup>

Majority of stroke survivors with left hemiplegia returned to work and had greater odds of return to work than those with right hemiplegia.

It was also found that those with right hemiplegia had a much higher likelihood to suffer speech problems than those with left hemiplegia. Bernspang and Fisher reported that stroke survivors with left and right stroke have hemispheric-specific differences in motor impairments, but do not differ significantly in performance of ADLs.<sup>36</sup> Social functioning, including return to work is also not significantly related to hemisphere lateralisation of stroke.<sup>37</sup> It would be reasonable to conclude that speech impairments, and not hemisphere lateralisation, influenced return to work in this study. The limiting effect of speech impairments was also identified by Alaszewski et al. who found a negative association between return to work and aphasia.<sup>28</sup> When a person has cognitive impairments, they experience the lowest employment rates as they are less likely to be employed in the competitive labour market.<sup>38</sup> If a less cognitively demanding job is not available for stroke survivors with cognitive impairments at their workplace, the employer might not be able to accommodate them.

The workplace intervention programme in this study required that stroke survivors attend intervention sessions at the workplace and this was difficult for some stroke survivors, especially those who did not have transport. They found it difficult to use public transport due to poor walking endurance and walking speed early after stroke. This intervention programme requires several work visits by therapists and thus will require more human resources. Currently there is shortage of therapists for vocational rehabilitation in South Africa<sup>3</sup> and thus, there is a need to consider expansion of the return to work services beyond the health department in order to get more funding for human resources dedicated to return to work programmes. This study was set in the economic and cultural context of South Africa, and therefore the results cannot be generalised to other countries due to differences in labour laws and social security systems.

In conclusion, a workplace intervention consisting of workability assessments and workplace visits was effective in facilitating return to work for stroke survivors in the Gauteng province of South Africa.

### Clinical messages

- Post-stroke survivors who received an individualised return to work programme were three times as likely to return to work compared with participants who received 'usual care'.
- Returning to work had a positive impact on quality of life for stroke survivors.

### Conflict of interest

The authors declare that there is no conflict of interest

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### Trial registration and ethical clearance

The RCT was listed on the South African National Clinical Trials register. Trial Number: DOH-27-0512-4079. Ethical clearance was granted by the University of the Witwatersrand committee for research on human subjects: Clearance number M081132.

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