The Effect of Vocational Rehabilitation on Return-to-Work Rates in Adults with Stroke

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CLINICAL SCENARIO:

The Transition Programme for Employment (TPE) is a pilot community-based multi-disciplinary service in Singapore that supports adults with acquired neurological conditions in their return to employment. Stroke survivors form the majority of TPE clients. Stroke affects an increasingly younger population in Singapore (National Registry of Diseases Office, 2018). With the low return-to-work rate after physical disability (McLean, 2007) and the potential reduction in quality of life without work (Vestling, Tufvesson, & Iwarsson, 2003), there is cause for concern. Hence, it is important to determine if vocational rehabilitation improves return-to-work outcomes among stroke survivors and to understand the characteristics of a potentially successful intervention. This could aid in advising clinical practice, particularly in programmes such as TPE.

FOCUSED CLINICAL QUESTION:

In adults with stroke, does participation in a vocational rehabilitation programme compared to no vocational rehabilitation increase return-to-work rates?

SUMMARY of Search, 'Best' Evidence' Appraised, and Key Findings

- Four studies met the eligibility criteria of the search. They included one randomised controlled trial, one case-control study, and two systematic reviews of retrospective cohort, before-after and case-control studies.
- The randomised controlled trial showed that a six-week work intervention programme for stroke participants with high function resulted in an employment rate three times higher in the intervention group at six months follow-up (Ntsiea, Van Aswegen, Lord, & Olorunju S, 2015).
- The case-control study showed that return-to-work rate was significantly higher for those who received professional vocational support and those supported by an occupational physician and rehabilitation staff (Doucet, Muller, Verdun-Esquer, Debelleix, & Brochard, 2012).
- Both systematic reviews found that the literature was inconclusive regarding the efficacy of vocational rehabilitation in the adult stroke population (Baldwin & Brusco, 2011; Wei, Liu, & Fong, 2016).

CLINICAL BOTTOM LINE:

There is limited, level II evidence demonstrating that vocational rehabilitation interventions can improve the return-to-work rate in higher functioning adults with stroke. Additional research is needed for further conclusions to be made for the wider population of adults with stroke.

Limitation of this CAT: This critically appraised paper (or topic) was prepared for a graduate course assignment and reviewed by an instructor.

SEARCH STRATEGY:

Terms used to guide Search Strategy:

- **P**atient/Client Group: Adults between the ages of 18 to 65 years diagnosed with stroke
- **I**ntervention: Vocational rehabilitation (any intervention that aims to return a sick or injured person to work or readiness for work)
- **C**omparison: No vocational rehabilitation
- **O**utcome(s): Return-to-work rates

Databases and Sites Searched	Search Terms	Limits Used
Cochrane Database of Systematic Reviews (CDSR), Cochrane Central Register of Controlled Trials (CENTRAL)	"Stroke (MESH), stroke or cva or cerebrovascular accident" AND "Vocational rehabilitation (MESH), vocational rehabilitation* or work rehabilitation*"	none
CINAHL	"Stroke (MESH), stroke or cva or cerebrovascular accident" AND "Vocational rehabilitation (MESH), vocational rehabilitation* or supported employment"	English language
Medline (OVID)	"Stroke (MESH), stroke or cva or cerebrovascular accident" AND "Vocational rehabilitation (MESH), vocational rehabilitation* or work hardening or work rehabilitation* or return to work program*"	English language all adult (19 plus years)

INCLUSION and EXCLUSION CRITERIA

- Inclusion:
  1) Study population includes adults diagnosed with stroke
  2) Attempts to compare vocational rehabilitation with usual care or alternative intervention
  3) Measures employment rate as an outcome

- Exclusion:
  1) Sample population with diagnoses of “traumatic brain injury” or “acquired brain injury”
  2) Studies that only include physical rehabilitation or do not provide details of intervention
  3) Measures non work-related outcomes only

RESULTS OF SEARCH

Four relevant studies were located and categorised as shown in Table 1 below.

Table 1: Summary of Study Designs of Articles Retrieved

Study Design/ Methodology of Articles Retrieved	Level*	Number Located	Author (Year)
Randomised controlled trial	2	1	(Ntsiea et al., 2015)
Retrospective case-control Study	4	1	(Doucet et al., 2012)
Systematic reviews i) of retrospective cohort studies ii) of retrospective cohort studies, case-control study, and one RCT	 3 3	2	 i) (Baldwin & Brusco, 2011; Wei et al., 2016) ii) (Wei et al., 2016)

* Level based on "The Oxford 2011 Levels of Evidence" (Howick et al., 2011).

BEST EVIDENCE

The following study/paper (Ntsiea et al., 2015) was identified as the ‘best’ evidence and selected for critical appraisal. Reasons for selecting this study included:

- The study purpose and sample population was most similar to the clinical (PICO) question.
- It was a randomised controlled trial (RCT), which is the ideal study design for questions that aim to investigate the effectiveness of an intervention.
- The study was published recently. Though there was a systematic review that was published a year later, it included many studies that did not meet the inclusion criteria and hence its summary of effects was diluted.

SUMMARY OF BEST EVIDENCE

Table 2: Description and appraisal of:

Ntsiea, M.V., Aswegan, H.V., Lord, S., & Olorunju S., S. (2015). The effect off a workplace intervention programme on return to work after stroke: a randomised controlled trial. *Clinical Rehabilitation*. 29(7):663-673.

Aim/Objective of the Study:
"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." (Ntsiea et al., 2015)

Study Design:
The study was an RCT, with assessors blinded and subjects not blinded. Allocation was concealed with the use of opaque envelopes and this was performed by an independent research assistant. An Excel computer programme completed the randomization. Outcomes were measured at 3 months and 6 months follow-up.

Setting:
Subjects were recruited from three hospitals in the Gauteng province of South Africa and participants participated in the intervention at their workplaces and hospitals (only for the first session involving assessment).

Participants:

- N = 80 (40 in control group, 40 in intervention group).
- The inclusion criteria included: (1) aged between 18 and 60 years, (2) employed in formal work sector at time of stroke, (3) less than 8 weeks post-stroke.
- The exclusion criteria were: (1) Barthel Index score of less than 12 out of 20, (2) involvement in another workplace intervention programme at time of study, (3) reported premorbid dependence in activities of daily living (ADLs), (4) unwilling to return to work after stroke.
- Subjects were recruited from three hospitals which offer stroke rehabilitation services, based on the eligibility criteria. No details were provided regarding recruitment procedures.
- The sample was randomised into intervention and control groups.
- Key demographic information of subjects include a mean age of 45 years, 51% males, and average stroke duration of 4.6 weeks. Baseline demographic factors were similar for both groups except the intervention group had:
  - more with left-hemiplegia;
  - higher level of education;
  - higher monthly income;
  - less with a helper at home.
- The authors reported a total of 8 dropouts, with 5 dropouts (2 deaths, 3 moved away) from the intervention group and 3 dropouts (2 deaths, 1 moved away) from the control group.

Intervention Investigated

The six-week workplace intervention programme was individually tailored based on functional ability and workplace demands (Ntsiea et al., 2015, Appendix A):

- Details of intervention: Work skills assessment and job evaluation were conducted before formulation of a treatment plan. Interviews are conducted with the patient and employer to establish consensus on the workplace intervention plan. Work site visits were conducted and a plan for reasonable accommodation was developed. Therapists monitored patients' progress and made modifications accordingly.
- Administered by: a physiotherapist and an occupational therapist, with support from a social worker/ psychologist/ speech therapist when needed.
- Frequency/ Dosage: Once a week for six weeks, for one hour per session except during the work skill assessment session (which took a minimum of four hours).
- Where/ When: Intervention commenced within 8 weeks post-stroke. The first week's session was conducted in hospital and subsequent weeks at the participants' workplace.

Outcome Measures

Primary outcome: Return to work rate

- A return to work questionnaire was used, which included a tick list for participants to indicate whether they returned to work or not.

Researches blinded to participant allocation completed the outcome questionnaire.

Main Findings

- Stroke survivors who participated in the programme had 5.2 times greater odds of returning to work at six months follow-up than those in the control group. The difference was statistically significant ($p<0.001$).
- At three months, the return to work rate of those in the intervention group was higher than that of control group, but this difference was not statistically significant ($p=0.13$).
- Those with left hemiplegia had 4.4 times greater odds of returning to work compared to those with right hemiplegia, and this was statistically significant ($p=0.005$).
- Participants who returned to work had significantly better quality of life at 6 months follow-up compared to those who did not return to work ($p=0.05$).

Table 3. Comparison of return-to-work rates between groups

Return-to-work (RTW) rates	3 months follow-up			6 months follow-up	
	Intervention (n=40)	Control (n=40)		Intervention (n=40)	Control (n=40)
RTW	11 (27%)	5 (12%)		24 (60%)	8 (40%)
No RTW	29(73%)	35 (88%)		16 (40%)	32 (80%)
	P = 0.13			**P<0.001**	
Factors that influenced RTW	Odds ratio	Standard error	z	p>|z|	95% confidence interval
Intervention group	5.2	2.8	3.1	0.002	1.8-15.0

(Ntsiea et al., 2015)

Original Authors' Conclusions

A workplace intervention programme comprising work skills and worksite evaluations was beneficial in improving the return-to-work rates of stroke survivors in the Gauteng province of South Africa. (Ntsiea et al., 2015)

Critical Appraisal (Law, Stewart, Pollock, Letts, Bosch, & Westmorland (1998). Critical Review Form – Quantitative Studies):

Validity

PEDro score of 7/10.

- This was a single-blinded, randomised controlled trial with intention to treat analysis completed. Allocation was concealed and the dropout rate was less than 15%. Between group comparisons and measures of variability were also reported adequately.
- However, there were several significant baseline differences between groups and it was not possible to blind participants and therapists to the intervention.

Study Purpose and Literature

The study purpose was stated clearly and background literature was reviewed to highlight how the study addresses gaps in research and the rationale behind the intervention investigated.

Design

The RCT study design was appropriate for the research question.
Potential biases are summarised in Table 4.

Table 4. Summary of bias

Type of bias	Description	Influence
1) Sampling bias	Attention bias due to more attention provided to the intervention group. Allocation bias due to baseline differences between groups - side of hemiplegia correlates with speech difficulties, which was a prognostic factor for RTW.	Favours intervention group
2) Intervention bias	Authors did not address contamination and co-intervention during the study, although contamination was screened for using the study's exclusion criteria. Different therapists provided the intervention and there was no mention of training conducted to standardise intervention provided between therapists. Site of intervention was different between groups. Placebo effect was possible due to the lack of blinding of subjects.	Could favour either group (contamination favours control group) Favours intervention group
3) Measurement bias	Lack of "masked" evaluation as RTW outcome was measured using a questionnaire, where self-reporting was done by the non-blinded subject. Validity of the RTW questionnaire was uncertain since no cross-checks were reported to ensure information provided was factual.	Favours intervention group

Sample

The sample was described in detail in Table 1 of the article and sample size calculation was done with a 90% power to detect differences.

Outcomes

The outcome measure used (a return to work questionnaire) was reported to be valid and reliable.

Intervention
Contamination and co-intervention were not addressed during the study.

Results
Analysis methods were used appropriately based on the assumption of normal distribution of the data. Statistical significance was reported and clinical significance was discussed.

Conclusion and Clinical Implications
Appropriate conclusions were drawn . Limitations of the study include:

- Sample population only included those who were functionally independent.
- Duration of follow-up was short (6 months).
- Return-to-work definition was narrow compared to other studies.
- The study outcomes were limited to returning subjects to working with existing employers, without exploration of new jobs/ employers.
- The authors did not address the possibility of contamination and co-intervention during the study which increases the risk of bias.
- The cost-effectiveness of the intervention was not determined.
- The study was set in the context of South Africa where cultural and economic influences may be different from other countries, including unemployment benefits.

Interpretation of Results
Transferability to clinical practice may be limited by the following:

- Early intervention may not be feasible for vocational rehabilitation in the community.
- The socio-economic environment and legislation in other countries may influence RTW outcomes (e.g. unemployment benefits, laws to protect discrimination by employers).
- The sample population only included those who were functionally independent, representing a very select sample of clients.
- Intervention could be time-consuming for therapists and lack cost-efficiency.

However, details of the intervention were provided, allowing potential replication.

This RCT showed favourable outcomes of a workplace intervention programme with the intervention group having 5.2 times greater odds of being employed at 6 months. Though results were clinically significant, it is important to note that there were more with left hemiplegia in the intervention group, which was related to higher return-to-work rates. The interplay of hand dominance and side involvement of hemiplegia to return-to-work rates is not known Difference between groups was not significant at the 3 month follow-up, suggesting the possibility that more time was required for successful return to work in the intervention group.

Results were statistically and clinically significant, bearing in mind the potential loss in quality of life, income/ productivity, and economic burden of unemployment post stroke.

Summary/Conclusion:
There is level-2 evidence to show that an early workplace intervention programme increases return-to-work rates at 6 months in stroke survivors who are functionally independent.

IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH

- The search found only 2 studies with conclusive evidence on the research topic. One was an RCT and the other a case-control study. Both reported significant benefits of vocational rehabilitation on return-to-work rates post stroke, although interventions were described differently in these two studies.
- The RCT showed relatively high methodological quality (PEDro 7/10). However, the sample population excluded those of lower function which was reported as a predictor of lower RTW rates (Black-Schaffer & Osberg, 1990; Doucet et al., 2012). The study also focused only on returning stroke survivors to their existing jobs, thus limiting its results.
- Differences in return-to-work rates in research studies are attributed to variations in the definition of "work", different follow-up periods, and differences in vocational rehabilitation services. (Baldwin & Brusco, 2011) This makes comparison of findings and justification of a particular service model difficult.
- Vocational rehabilitation in Singapore is a growing field and comprehensive programmes that support stroke survivors in returning to employment are scarce. Similarities can be drawn between components of vocational rehabilitation described in the above studies and those that have been adopted in local practice. It is important to advice on the efficacy of these programmes based on both quantitative (RTW rates) and qualitative evidence.
- More high quality evidence is required to determine the effects of vocational rehabilitation on employment in adults with stroke. This should include large RCTs that involve stratification to minimise baseline differences between groups and that have longer follow-up periods. The cost-effectiveness of these programmes should also be evaluated.

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