International
Journal of Neurorehabilitation
ISSN: 2376-0281

Review Article Open Access

A Brief Review of Post-stroke Employment in Singapore

Mervyn J.R. Lim[1,2]*, Benjamin T.Y. Wong[3], Pauline P.W. Koh[4], Rebecca Raszewski[5] and Miho Asano[1]

[1]*Saw Swee Hock School of Public Health, National University of Singapore, Singapore*
[2]*Division of Neurosurgery, National University Hospital, Singapore*
[3]*School of Economics, Singapore Management University, Singapore*
[4]*Therapy Hub, SPD, Singapore*
[5]*Library of the Health Sciences, University of Illinois at Chicago, Chicago, United States of America*

Abstract

Post-stroke employment is of increasing importance in Singapore. We reviewed the prevalence, outlined the pathways and resources, and identified potential barriers and facilitators to post-stroke employment in Singapore. This study consisted of a systematic review of post-stroke employment research in Singapore and eight consultations with professionals involved in the care of stroke survivors. There were four published studies that investigated post-stroke employment status in Singapore, with an average prevalence of 45.9%. We outlined three pathways (employer, independent search, and community resource), and identified barriers and facilitators (categorized as employer, healthcare system, and personal factors) to post-stroke employment. Important barriers and facilitators to post-stroke employment in Singapore included the patient's motivation, financial incentives for or against returning to work, financial considerations of employers, and a patient's actual disability. Overall, the Singaporean model of post-stroke employment appears to support stroke survivors through government-affiliated and Voluntary Welfare Organisations that handle job support, as well as financial support for employers and persons with disabilities. Existing programmes and the uptake of community-services should be further investigated to inform stakeholders and improve on current programmes.

Keywords: Stroke rehabilitation; Vocational rehabilitation; Return to work; Employment; Disabled persons

Introduction

Stroke is the 6th highest cause of disability in Singapore [1]. The incidence of young stroke amongst individuals who are of the working population in Singapore is increasing [2]. Post-stroke employment is a significant contributor to life satisfaction after stroke thus it is important for this group of stroke survivors. However, despite a large body of evidence on the factors preventing return to work, post-stroke employment continues to be a significant challenge that stroke survivors face today [3-8].

In this review, we reported the prevalence, pathways, resources, and identified potential barriers and facilitators to post-stroke employment in Singapore. We conducted a systematic review of post-stroke employment research in Singapore using three electronic databases, and held eight consultations with experts (healthcare professionals and representatives from the public sector and Voluntary Welfare Organisations) who were involved in the care of stroke survivors in Singapore.

Prevalence of Post-stroke Employment in Singapore

We identified 41 studies from three electronic databases, MEDLINE *via* OVID (1946-2017), EMBASE (1974-2017), CINAHL Plus with Full Text (1937-2017), and through a bibliography search in July 2017. Thirty-two studies were screened after duplicates were removed, and we included four studies on post-stroke employment in Singapore (published from year 1983 to 2012) [9-12]. The sample size ranged from 29 [10] to 1310 [12], and the majority of participants were male and diagnosed with ischemic stroke (Table 1). The prevalence of post-stroke employment in Singapore ranges from 37.5% to 55.0%, with an overall average of 45.9% [9,10]. Our experts estimated a post-stroke employment prevalence of 10.0% to 50.0% for all stroke survivors, and 20.0% to 69.0% for stroke survivors enrolled in employment support programmes. This was comparable to post-stroke employment rates worldwide of 35.0% to 75.0% [8,13-17].

Pathways to Post-stroke Employment in Singapore

We identified three main pathways for post-stroke employment in Singapore: (1) Employer, (2) Independent Search, and (3) Community Resources Pathway (Figure 1). After stroke, a patient experienced acute care followed by rehabilitation [18-20]. This process began in the tertiary hospital, but was subsequently transferred to subacute inpatient or community rehabilitation facilities [21]. While there seemed to be no specific guide on when to raise the question of returning to work after stroke, our experts highlighted that this discussion typically began with the first meeting between patients and their rehabilitation physicians.

Employer Pathway

Some stroke survivors retained their employment by previous employers. Our experts reported that employee-employer relationships, prior knowledge in hiring persons with disabilities, job expectations of stroke survivors, and the employer's financial considerations were important factors for post-stroke employment (Table 2). Without exceptional support to communicate with employers, and an empathetic employer, stroke survivors were at significant risk of losing their pre-stroke employment. Moreover, small and medium-sized enterprises employed two-thirds of the Singapore workforce, and these organisations typically did not have sufficient resources to retain jobs for employees who had suffered from stroke. Negative perceptions amongst employers towards hiring stroke survivors were also evident in studies conducted in other developed countries and pointed towards the importance of employer education [17-23,24].

***Corresponding authors:** Lim MJR, Division of Neurosurgery, 5 Lower Kent Ridge Road, 119074, Singapore, E-mail: mervynlim@u.nus.edu

Received July 08, 2019; **Accepted** September 10, 2019; **Published** September 17, 2019

Citation: Lim MJR, Wong BTY, Koh PPW, Raszewski R, Asano M (2019) A Brief Review of Post-stroke Employment in Singapore. Int J Neurorehabilitation 6: 354.

First Author (Year)	Study Design	Sample Size (N)	Age (Years); N (%); Mean (SD)	Male N (%)	Prevalence of PSE N (%)	Barriers to PSE (Identified by the Authors)
Tan ES (1983) [12]	Retrospective chart review	1310	≤ 45: 162 (12.4); 46-60: 516 (39.4); >60: 632 (48.2)	763 (58.2)	338 (50.6)[1]	§ Delayed rehabilitation
Yap EC et al. (2002) [9]	Retrospective chart review	39	Mean: 50.9 (12.7)	21 (53.8)	9 (37.5)[2]	§ Older patients
						§ Lower modified Barthel Index score (at discharge)
Chan ML (2008) [10]	Retrospective chart review	29	Not reported	Not reported	16 (55.0)	§ Unfit to work in general
						§ Needed further rehabilitation
						§ Further medical care needed
						§ Failed to meet appointments
						§ Withdrawal from the job trial
Chan WY et al. (2012) [11]	Cross-sectional telephone survey	79	<65: 15 (12.2); ≥ 65: 108 (87.8)	60 (75.9)	32 (40.5)	§ Severe disability
						§ Advanced age
						§ Depression
						§ Environmental challenges

[1]Out of 668 participants who were previously employed; [2]Out of 24 participants who were previously employed

Table 1: Characteristics of included studies, prevalence, and barriers to post-stroke employment in Singapore.

Factors for PSE	Number of Experts (N)	Quotes from Consultations with Experts
Employer Factors		
a) Financial Considerations for Employing Stroke Survivors	5	• "Many companies may face increased financial difficulty in returning a stroke survivor back to the workplace." • "employers worried about insurance liability (small and medium-sized enterprises) may not have the resources."
b) Employer Expectations of Stroke Survivors	4	• "As long as there is a visible disability and cognitive impairment, employers may have a perception that this person is not ready for employment." • "Employers place unrealistic expectations on stroke patients and do not provide enough time for them to orientate to the workplace- for example: clients can type, but need longer time for them to be able to type fast enough."
c) Knowledge of Employers' Facilitating Return to Work	2	• "Human resource may not understand the clinical diagnosis and may be afraid of taking unnecessary risks bringing the individual back to the workplace."
d) Employee-Employer Relationships	2	• "Close relationship between employers and stroke patients prior to stroke episode is key to returning them back to the workplace"
Healthcare System Factors		
a) Medical Certification for Return to Work	4	• "Whether the patient has frequent follow-up appointment with the hospital or is still on medical leave, (it is a barrier to employment)." • "Difficulty… in the process of certifying their clients "fit for work" is a barrier towards employment."
b) Access to community-based services	4	• "Assistive Technology Fund, Open Door Fun, Building and Construction Authority accessibility fund can be tapped on for job redesign/ adoption of assistive technologies." • "The assistive technology fund for individuals with permanent disability helps to cover costs for ready-made technologies. It is means-tested."
c) Communication between Healthcare Professionals and Employers	3	• "(The role of occupational health physicians is to) bridge the link between clinicians and human resource practitioners" • "(The rehab physician can) facilitate employment: does the patient need memos to explain suitable work profiles or recommendations on modifications/ changes needed at the workplace etc."
Personal Factors		
a) Personal Motivation	6	• "People who are hitting the retirement age soon and have sufficient family support (may be less motivated to return back to the workplace)." • "Stroke survivor's motivation to return to meaningful activity- including employment"
b) Financial Incentives	5	• "Clients that have larger financial incentives are more motivated to return to work… some stroke survivors are "comfortable" with the money provided by social assistance, family members or friends… social workers often have to work through the financials to explain that return to work is a more sustainable long-term solution" • "Reduced incentive if they are offered government financial assistance- the job salary offered need not be significant due to the reduced job scope"
c) Actual Disability	5	• "Lack of a job-fit situation cognitive function may have suffered (from the stroke episode)" • "Need to factor in the onset of other diseases/ illnesses after the stroke that may reduce their chances of employment"
d) Prior Educational Qualifications	3	• "Person not able to adapt to new job role due to lack of skills or knowledge." • "White collar workers find it easier to return to employment as opposed to blue collar workers
e) Perceived Disability	3	• "Patients who see progress in their rehab sessions have reduced incidence of depression/ more motivation." • Some clients think that upper limb use is very important; and that they should only return to work after full recovery"
f) Employees' Job Expectation	2	• "Mismatched expectations of the job- unable to support their lifestyle needs."
g) Time from Stroke	2	• "The longer the duration that the stroke patient has left the workplace… the more reluctant he/ she is returning to the workplace"

Table 2: Barriers and facilitators to post-stroke employment based on consultations with experts.

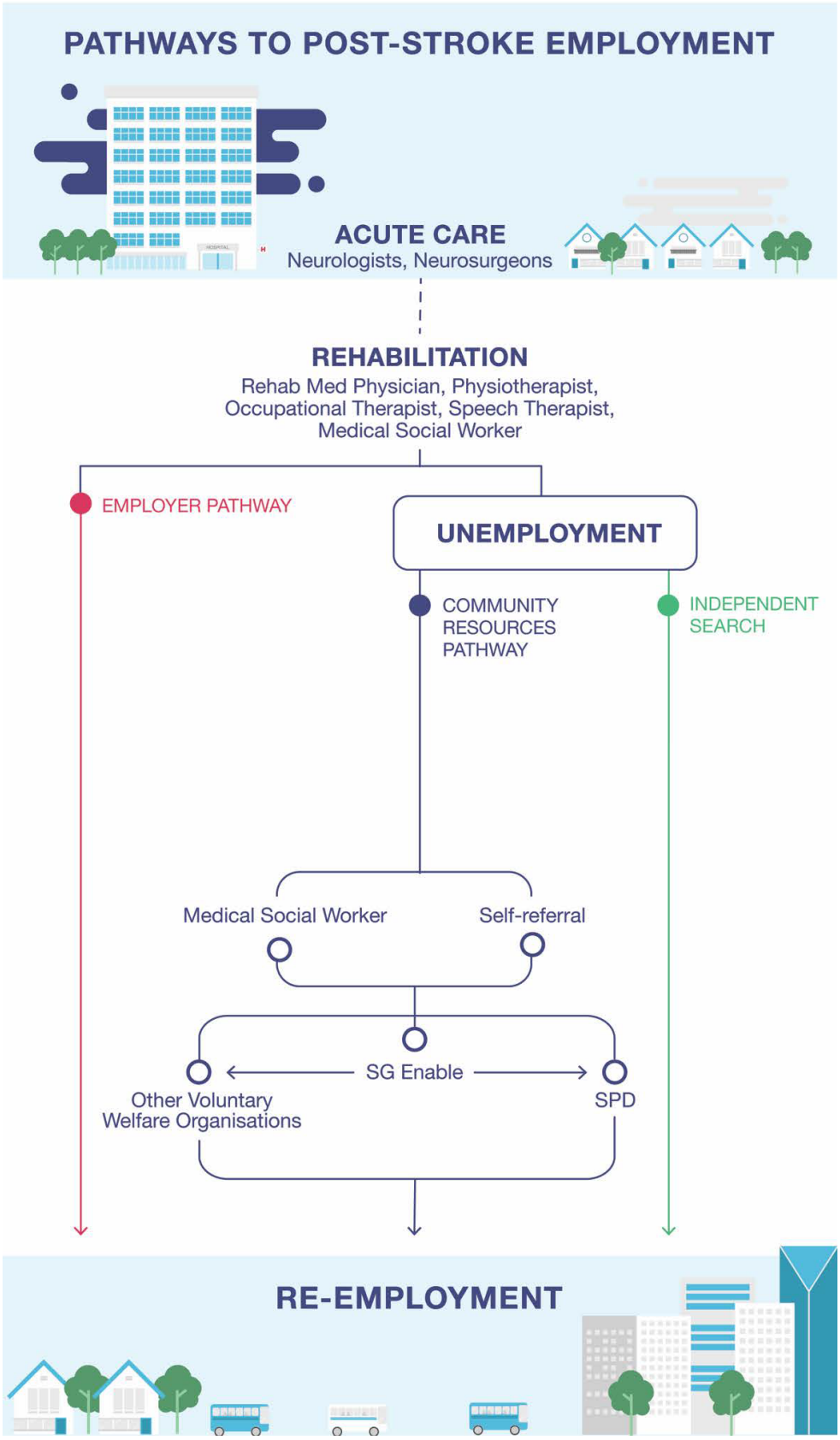

Figure 1: Overview of pathways to post-stroke employment in Singapore.

Return to Work	
1. Public Transport Concession Scheme (SG Enable) [28]	Provides subsidised public transport fares for persons with disabilities
2. Taxi Subsidy Scheme (SG Enable) [28]	Provides up to 50% subsidy for taxi fares for individuals unable to take public transport
3. Assistive Technology Fund (SG Enable) [29]	To acquire, upgrade or repair necessary equipment and accessories for the purpose of employment, rehabilitation or independent living
4. Workfare Income Supplement (Central Provident Fund) [30]	Encourages eligible workers to continue working and build up their Central Provident Fund savings through cash payments and Central Provident Fund contributions
5. Workfare Training Support (Workforce Singapore) [30]	95% course fee funding for a selected upgrading course and training allowance of S$4.50 for each hour of training
6. Skills Future Study Award for Persons with Disabilities (Skills Future Singapore) [31]	For persons with disabilities to develop and deepen their relevant competencies and skillsets
7. Disabled Persons Scheme (SG Enable) [32]	Means-tested scheme that supports persons with permanent disabilities who are unable to use public transport and require a vehicle to earn a living
Temporary financial assistance	
1. Comcare (Social Service Offices, Ministry of Social and Family Development) [33]	Provides assistance for individuals who are unable to find a job or work for a period of time due to illness
Employers	
1. Open Door Fund (Workforce Singapore) [34]	Involves various subsidies to encourage employers to hire persons with disabilities (e.g. Apprenticeship Programme for New Employees, job re-design subsidies, training grant, recruitment and job support services)
2. Special Employment Credit (Ministry of Manpower) [35]	Tax incentive set at 16% of the employee's monthly income, up to S$240 per month
3. SkillsFuture Study Award for Disability Employment Professions (SkillsFuture Singapore) [31]	Encourages experienced disability employment professionals to strengthen their competencies, so that they can deliver quality service to persons with disabilities and their employers
4. The Accessibility Fund (Building and Construction Authority) [35]	Provides 60% to 80% of construction costs to owners for upgrading of selected older private buildings with accessibility features, such as lifts, ramps, and accessible toilets

Table 3: Overview of government subsidies available to employers and stroke survivors.

Independent Search Pathway

Stroke survivors who had lost their previous job could attempt to regain employment through the enlistment of private employment agencies to aid in job-search and job matching. Our experts highlighted that these stroke survivors may be unaware of the availability of community-based services to support employment or believed that they did not need such assistance. Our experts further explained that having a smooth transition from the acute care setting to community-based services was important to facilitate the success of post-stroke employment [25,26]. Coole et al. [27] added that a delay of vocational rehabilitation due to the narrow emphasis in getting survivors home from the hospital meant that stroke survivors may lose their jobs [27].

Community Resources Pathway

Stroke survivors may be referred to community-based services from the healthcare setting or through their own efforts. Singapore employed a centralised model for post-stroke employment support in the community, whereby SG Enable, an agency set up by the Ministry of Social and Family Development, was one of the primary organizations that handled requests for job support. SG Enable referred people with residual physical or intellectual disabilities resulting from stroke to various Voluntary Welfare Organisations, including SPD, for job placement and job support initiatives.

Upon receiving a referral, SPD performed an initial client assessment to determine suitability for various job positions. This included an evaluation of the client's need for assistive technology, vocational rehabilitation, training courses, or job-hardening programmes to improve an individual's potential for employment. After a successful job match, SPD provided three-months to one year of job support to help their client integrate with his or her new work environment. SPD also managed the Transition to Employment programme that specialised in providing employment support for patients with stroke and spinal cord injury.

In addition to community services, Singapore provided financial support for both employers and stroke survivors through subsidies administered by government-affiliated agencies (Table 3) [28-36]. Moreover, access to job-matching services by employment support specialists from SPD is free for Singaporean citizens.

Barriers and Facilitators to Post-stroke Employment in Singapore

Our experts highlighted barriers and facilitators to post-stroke employment in Singapore, which were classified into employer, healthcare system, and personal factors (Table 2). These were similar to those reported in the literature [17,24,37-39]. The factors most frequently mentioned by our experts included (1) the patient's motivation, (2) financial incentives for or against returning to work, (3) financial considerations of employers when hiring stroke survivors, and (4) the severity of a survivor's disability. These findings were supplemented by our systematic review, which highlighted that barriers to employment in Singapore included delayed rehabilitation, lower modified Barthel Index score on discharge, and depression [9,11]. These indicated key areas for further research and intervention targets by stakeholders involved in post-stroke employment [12].

Conclusion

The Singaporean model of post-stroke employment appears to support stroke survivors through government-affiliated and Voluntary Welfare Organisations that handle job support and financial support. More in-depth research on existing programmes and the uptake of community-services for post-stroke employment in Singapore is warranted to further inform practitioners and stakeholders involved in the success of post-stroke employment.

Acknowledgements

We thank Caroline Teng, Graphic Communicator and Typographer, for her help with the design of the figures, and Mr. Vincent Cai from the Saw Swee Hock School of Public Health for his contribution to this article.

Conflict of Interest

The authors declare that there is no conflict of interest.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article. This work was supported by the Saw Swee Hock School of Public Health, National University of Singapore, Start-up Grant awarded to Miho Asano.

References

1. https://www.moh.gov.sg/docs/librariesprovider5/resources-statistics/reports/singapore-burden-of-disease-study-2010-report_v3.pdf.
2. https://www.nrdo.gov.sg/docs/librariesprovider3/default-document-library/singapore-stroke-registry-annual-report-20151bcb13a5c9d76bafab5aff000014cdee.pdf?sfvrsn=0.
3. Vestling M, Tufvesson B, Iwarsson S (2003) Indicators for return to work after stroke and the importance of work for subjective well-being and life satisfaction. Journal of rehabilitation medicine. J Rehabil Med 35: 127-131.
4. Langhorne P, Pollock A, Stroke Unit Trialists C (2002) What are the components of effective stroke unit care? Age and ageing Age Ageing 31: 365-371.
5. Wolfenden B, Grace M (2009) Returning to work after stroke: a review. Int J Rehabil Res 32: 93-97.
6. Balasooriya-Smeekens C, Bateman A, Mant J, De Simoni A (2016) Barriers and facilitators to staying in work after stroke: insight from an online forum. BMJ Open 6: e009974.
7. Brannigan C, Galvin R, Walsh ME, Loughnane C, Morrissey EJ, et al. (2017) Barriers and facilitators associated with return to work after stroke: a qualitative meta-synthesis. Disability and rehabilitation. 39: 211-222.
8. Endo M, Sairenchi T, Kojimahara N, Haruyama Y, Sato Y, et al. (2016) Sickness absence and return to work among Japanese stroke survivors: a 365-day cohort study. BMJ Open. 6: e009682.
9. Yap EC, Chua KS (2002) Rehabilitation outcome after primary subarachnoid haemorrhage. Brain inj 16: 491-499.
10. Chan ML (2008) Description of a return-to-work occupational therapy programme for stroke rehabilitation in Singapore. Occup Ther Int 15: 87-99.
11. Chan WY, Chew NJ, Nasron LI, Fook-Chong SM, Ng YS (2012) A cross-sectional study of the demographic, cultural, clinical and rehabilitation associated variables predicting return to employment after disability onset in an Asian society. Work 43: 461-468.
12. Tan ES (1983) Stroke rehabilitation-Singapore experience. Annals of the Academy of Medicine, Singapore. 12: 373-376.
13. Busch MA, Coshall C, Heuschmann PU, McKevitt C, Wolfe CD (2009) Sociodemographic differences in return to work after stroke: the South London Stroke Register (SLSR). J Neurol Neurosurg Psychiatry 80: 888-893.
14. Hackett ML, Glozier N, Jan S, Lindley R (2012) Returning to paid employment after stroke: the Psychosocial Outcomes In StrokE (POISE) cohort study. PloS one 7: e41795.
15. Westerlind E, Persson HC, Sunnerhagen KS (2017) Return to Work after a Stroke in Working Age Persons; A Six-Year Follow Up. PloS one 12: e0169759.
16. Larsen LP, Biering K, Johnsen SP, Andersen G, Hjollund NH (2016) Self-rated health and return to work after first-time stroke. J Rehabil Med 48: 339-345.
17. Chang WH, Sohn MK, Lee J, Kim DY, Lee SG, et al. (2016) Return to work after stroke: The KOSCO Study. J Rehabil Med 48: 273-279.
18. Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, et al. (2016) Guidelines for Adult Stroke Rehabilitation and Recovery: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke. 47: e98-e169.
19. National Clinical Guideline C. National Institute for Health and Care Excellence: Clinical Guidelines. Stroke Rehabilitation: Long Term Rehabilitation After Stroke. National Institute for Health and Care Excellence: Clinical Guidelines. London: Royal College of Physicians (UK) National Clinical Guideline Centre.; 2013.
20. Graham LA (2013) Organization of rehabilitation services. Handbook of clinical neurology. Handb Clin Neurol 110: 113-120.
21. Venketasubramanian N, Ang YH, Chan BP, Chan P, Heng BH, et al. (2008) Bridging the gap between primary and specialist care--an integrative model for stroke. Ann Acad Med Singapore 37: 118-127.
22. Singapore Ministry of Communications and Information (2017) SMEs are at the heart of our economy Singapore.
23. Killey J, Gustafsson L, Hoyle M (2014) Paths to Work after Stroke in Australia. Brain Impairment 15: 99-106.
24. Medin J, Barajas J, Ekberg K (2006) Stroke patients' experiences of return to work. Disabil Rehabil 28: 1051-1060.
25. Saito Y, Mineo M, Yaeda J (2013) Work support for working age persons who have experienced a stroke in Japan: cooperation between hospitals and work support agencies. Work 45: 267-272.
26. Ntsiea MV, Van Aswegen H, Lord S, Olorunju SS (2015) The effect of a workplace intervention programme on return to work after stroke: a randomised controlled trial. Clin Rehabil 29: 663-673.
27. Coole C, Radford K, Grant M, et al. (2013) Returning to work after stroke: perspectives of employer stakeholders, a qualitative study. J Occup Rehabil 23: 406-418.
28. https://www.sgenable.sg/pages/content.aspx?path=/schemes/transport/
29. https://www.msf.gov.sg/assistance/Pages/Assistive-Technology-Fund-ATF.aspx
30. https://www.workfare.gov.sg/Pages/WIS.aspx
31. https://programmes.myskillsfuture.sg/Portal/ProgramListing.aspx?source=SFSA
32. https://www.sgenable.sg/pages/content.aspx?path=/schemes/transport/disabled-persons-scheme/
33. https://www.msf.gov.sg/Comcare/Pages/Short-to-Medium-Term-Assistance.aspx
34. http://www.wsg.gov.sg/programmes-and-initiatives/open-door-programme-employers.html
35. https://www.sec.gov.sg/Pages/Home.aspx
36. https://friendlybuildings.bca.gov.sg/
37. Hannerz H, Holbæk Pedersen B, Poulsen OM, Humle F, Andersen LL (2011) A nationwide prospective cohort study on return to gainful occupation after stroke in Denmark 1996–2006. BMJ Open. 1: e000180.
38. Rubenson C, Svensson E, Linddahl I, Björklund A (2007) Experiences of returning to work after acquired brain injury. Scand J Occup Ther 14: 205-214.
39. Lundqvist A, Samuelsson K (2012) Return to work after acquired brain injury: a patient perspective. Brain Inj 26: 1574-1585.