Evaluation of the Relationship between Functional Independence and Quality of Life in Patients with Chronic Stroke

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Abstract

Stroke is a primary cause of long-term disabilities. Impact of stroke on individuals can be devastating which include an increased dependency on others for activities of daily living, change in mood and cognition, and disruption of social interactions. Such changes have negative influences on the quality of life (QoL); however, it is commonly neglected. This study aimed to determine the functional independence and QoL in chronic stroke patients and the relationship between these factors. **Materials and Methods:** In this cross-sectional study, QoL and functional independence of chronic stroke patients (n=63, aged 24-65 years) were assessed by World Health Organization Quality Of Life questionnaire (WHOQOL-Bref) and Barthel index. These participants had experienced only one stroke and had no other orthopedic, neurologic or psychological disorders. **Results:** The mean age of participants was 46.11±11.93. The mean score of total QoL was relatively low (58.91±12.21) and mean score of Barthel Index was 87.46±13.04. Psychological and environmental domains had lowest and highest scores respectively, and males had a higher QoL in comparison to females in all domains. There was a correlation between functional independence and overall QoL (r=0.001), functional independence was highly correlated with physical (r=0.000) and environmental (r=0.016) domains (P<0.001). **Discussion:** The results demonstrated that in the majority of participants the QoL was not favorable and is correlated with functional independence level, although further studies are necessary to confirm these findings. The results emphasize more attention to psychosocial aspects of stroke survivors.

Key words: Functional independence, Quality of Life, Stroke

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Introduction

Stroke is the second leading cause of death and long-term disability in adults worldwide (1). Signs and symptoms of stroke depend on the involved hemisphere. Since cerebrovascular damages cause dysfunction in Upper Motor Neuron (UMN), the stroke may also develop perceptional disorders, visual impairments, sensory disorders, cognitive changes, and a set of speech disorders (2), which results in reduced independence in the daily activities of the patients. The stroke-induced disability intensively affects patients socially and physically, and approximately half of the stroke patients required the help of others in their daily activities for a long term after the stroke (1). Daily activities refer to a set of self-care activities including basic activities of daily living (BADLs) and personal activities of daily living (PADLs). Such activities are necessary to social life and guarantee the health and survival of the patients. Daily activities are a part of human functioning arenas including compliance with hygiene, clothing, eating, functional mobility, communicating, and sexual relations (3). Functional independence is the ability to perform such activities without assistance or supervision of others and also is an essential functional aspect of human life (4). Independence in daily activities results in personal satisfaction and more self-confidence, which provide strong motivation for social functioning (5). Different studies suggested functional independence as an essential predictor of quality of life (QoL) (6-8). QoL is the individual's perception of life conditions based on the cultural background of the community lives in, and also is associated with individual's aims, expectations, and

standards (9, 10). Different studies showed that the QoL is decreased after stroke (11). A few studies performed in Tehran, Iran, evaluated the level of QoL in patients with stroke and investigated the relationship between stroke and functional independence in such patients.

Robinson *et al.* demonstrated a moderate correlation between functional independence and QoL 6 months after stroke; however, there was no relationship in the first month (5). Ones *et al.* indicated that the level of QoL was significantly lower in the cases, compared with the controls and there was significantly lower in stroke survivors compared with healthy individuals andfunctional status scores. However, the study by Ones *et al.* had no age limits, and the mean age of the patients in the case group was 62 years (14). Fattahi *et al.*, evaluated the QoL in patients with acute and chronic stroke referring to rehabilitation centers in Kermanshah, Iran, using the 36-Item short form survey (SF-36). Results of their study showed that the QoL was affected by stroke in all evaluated subscales, particularly in the physical (15). Raju *et al.*, assessed the QoL, psychosocial problems, and functional independence in patients with chronic and acute stroke. Anxiety, depression, and functional dependence were among the low QoL predictors in their study. They also showed that older ages and severe stroke increased the risk of functional dependence, although more than 60% of the study participants were above 60 years (16). Ahlsio *et al.* showed that the increased disability reduces the QoL in patients with stroke; the mean age of the patients in their study was 71 years and about one-fifth of the patients had a previous stroke or transient ischemic attack (TIA). Moreover, they used interview and figures to evaluate QoL in patients, while despite the ease of use, the selected tools were not enough accurate and categorized. In each course of the interview, 20-24% of the subjects could not respond reasonably (17).

In the previous studies, the role of factors influencing functional independence (such as old age) and QoL (such as psychiatric disorders), and the time of assessments (acute/chronic phase of the disease) were neglected (15, 16, 19). Owing to the significant differences between the physical and mental status of patients in acute and chronic phases of stroke, the assessments results were not categorized based on chronic and critical aspects of the disease (15, 18, 19). Also, as per our knowledge, no study evaluated the functional independence of middle-aged and young patients with acute stroke. Owing to the point that QoL is a culture-dependent factor (12, 13), results obtained from different cities and countries cannot be generalized to other regions of the world. There is a high prevalence of stroke and the great importance of determining factors influencing the QoL in such patients, and also there is the lack of enough knowledge about the effect of functional independence on QoL in patients with stroke in Iran. Therefore, the current study aimed at evaluating the relationship between functional independence and QoL in patients with chronic stroke.

Materials and Methods

The current cross-sectional, descriptive-analytical study aimed to evaluate the relationship between functional independence and QoL in patients with chronic stroke in Tehran, Iran. Patients underwent preliminary evaluations based on the inclusion and exclusion criteria as well as their medical records. Accordingly, a total of 63 eligible patients were selected by the convenience sampling method. The inclusion criteria were the first-ever stroke, age range 25 to 65 years, at least six months apart from the onset of stroke, ability to read and write, ability to complete the QoL questionnaire, and lack of psychological disorder and history of hospitalization (and/or taking antidepressant drugs during the study). The exclusion criteria were the presence of other neurologic disorders and orthopedic or rheumatologic comorbidities, and unwillingness to cooperate with the study.

The patients were explained about the aims, objectives, and methodology of the study and after signing the informed consents, they were asked to complete the demographic questionnaire, the world health organization (WHO) QoL-BREF (WHO QoL-BREF), and the Barthel activities of daily living (ADL) index. The demographic questionnaire used in the current study was completed by the subjects themselves; the Barthel ADL index was completed either by patients or their primary caregivers.

The 26-item WHOQOL-BREF is one of the most common questionnaires used to evaluate all aspects of QoL in 4 areas of physical health, mental health, social relationship, and environment. The Questionnaire is scored based on a 4-20 or 0-100 scale, higher scores indicate higher QOL. The Cronbach's alpha of the questionnaire was 0.84; the reliability of the questionnaire in Iran was assessed by the test-retest that was 0.7 for each area (18, 19).

The Barthel ADL index is a 10-item questionnaire, which evaluates grooming, bathing, feeding, toileting, stepping-up and -down, dressing, bowel control, bladder control, transfer (bed to chair and back), and Mobility (on level surfaces). The Barthel index evaluates the culture-independent factors, and the score range is 0-100.To complete the ADL Barthel index, each item was scored by an expert based on the ADL Barthel index guidelines. Then, the scores were summed. There is a strong correlation between the results of the Barthel ADL index and those of the Fugl-Meyer assessment and the Berg balance scales (20).

The collected data were analyzed with SPSS version 16, using mean±standard deviation (SD), the Spearman correlation coefficient, and the Mann-Whitney U, and the Kruskal-Wallis tests.

Table 1. Descriptive Data of Functional Status and Quality-of-Life in the Study Subjects

Variable	Mean (SD)	Range
Functional status (the Barthel ADL index)	87.46 (13.04)	40-100
Male	89.50 (10.77)	45-100
Female	85.60 (14.72)	40-100
Total QoL	58.91 (12.21)	34-75
Physical health	57.71 (14.23)	25-94
Mental health	54.90 (14.39)	19-75
Social health	55.29 (16.62)	19-81
Environment	68.73 (15.27)	38-94

Table 2. The Correlation between Functional Status and QoL in the Study Subjects (* at 0.05 level; ** at 0.01 level)

Statistical Variable / Index		The Spearman Correlation Coefficient	*P*-value
Functional independence	Total QoL	0.406	0.001**
	Physical health	0.626	0.000**
	Mental health	0.247	0.51
	Social health	0.205	0.106
	Environment	0.303	0.016*

Results

In the current study, 63chronic stroke survivors and the age range of 24 to 65 years (mean±SD of age: 46.11±11.93 years) were enrolled. Thirty subjects were male, and 33 were female; 33 had right-sided and 30 left-sided hemiplegia. In 18 patients, about 6-12 months were elapsed from the onset of stroke, while it was 12-24 months in 30 subjects, and >24 months in 15 patients.

The level of QoL and functional status of the study subjects are presented in Table 1. Results indicated that the subscales of the environment and mental health got the highest and lowest scores, respectively.

The Shapiro-Wilk test was used to evaluate the normality of the data, and the results showed that the distribution of data was non-normal for total QoL and QoL subscales scores. Owing to the non-normal distribution of data for QoL and functional independence, the Spearman correlation test was used to evaluate the association between QoL and functional independence (Table 2). Results showed a significant correlation between the scores of functional independence and total QoL as well as physical health and environment subscales. The Spearman correlation test indicated no significant correlation between the age and total QoL scores (P=0.146). There was no significant correlation between gender and affected side of body with total QOL score, based on Mann-whitney U test. The Kruskal-Wallis test showed no significant relationship between the time elapsed from the onset of stroke and total QoL score (P=0.692).

Discussion

Results of the current study showed a correlation between independence in daily living activities and QoL, but no association was observed between the variables of gender, time elapsed from the onset of stroke, and the affected side of the body and QoL.

The correlation and association between the functional independence and disability and QoL were also reported in some of the previous studies (14). The results of the current study are in agreement with the studies conducted by Ahlsio *et al.*, Johnson *et al.*, Jaracz *et al.*, and Haghgoo *et al.*, who suggested a correlation between the functional status (the ability to perform daily living activities) and QoL in stroke survivors (7, 8, 17, 21). The results of the current study also corroborate with the study conducted by Robinson *et al.*, who indicated an association between functional independence and QoL 6 months after the onset of stroke (5). Participation in meaningful/purposeful activities creates a sense of competence in individuals, which results in physical and mental health (22). Studies indicated that patients with stroke experience a wide range of disabilities and activities limitation one year after stroke and even more (23). Patients with activities limitation encounter lower movement, which results in negative impacts on their health status and QoL (24). Hackett *et al.* performed a study on stroke patients and reported that 60% were dependent on others in their daily living activities, particularly clothing, bathing, transportation, and walking out the door. Further, they stated that the QoL in patients who were dependent on others in their daily living activities was

significantly lower than that of their non-dependent counterparts (25). In a study by Haghgoo *et al.*, limited participation in meaningful activities and depression were addressed as the most important QoL predictors (21). Choi-Kwon *et al.*, found that in the month three after the incidence of stroke, lack of independence in daily living activities, economic and occupational status, and depression were the factors which negatively affect patients' QoL. Additionally, they also indicated that such factors even influencing patients' QoL 3 years after the stroke, but dependence to others in daily living activities was the most important influencing factor (26).

Lack of association between demographic variables (age, gender, time elapsed from stroke, and the affected side of the body) and level of QoL was also observed in the current study. Similar studies reported different results about the association between age and level of QoL in patients with stroke. Fatahi *et al.* suggested that younger patients experience lower QOL (15). In contrast, Jafari *et al.* showed that the level of QoL was lower in older patients with stroke (27). Moreover, in a study by Ones *et al.*, no significant difference was observed between the QoL scores of patients under 65 years and above (14). Carod-Artal *et al.*, also found no association between age and QoL in patients with stroke (28). Different age ranges and different distribution patterns of patients in the age ranges can explain controversial results in similar studies. Although inconsistent with the results of Fatahi *et al.* and Jafari *et al.*, the current study tried to neutralize the effects of old ages on the QoL by considering the age range of 24 to 65 years.

Although all male patients in the current study had higher QoL scores compared with those of their female counterparts, no significant difference was observed between the genders in the evaluated areas. The results of the present study are in agreement with those of Ones *et al.*, Jafari *et al.*, and Torfi *et al.* (14, 27, 29). Storm *et al.* suggested the female gender as a lower QoL predictor in the onset of stroke (30). Patel *et al.* also considered the female gender as a predictor for lower QoL in physical aspects for stroke survivors during the first year after the incidence of stroke (31). Also, Khayatzadeh *et al.* reported significantly lower levels of QoL in females than males (32). Kuroda *et al.* indicated that differences in QoL level existed between males and females before the incidence of stroke (33). However, it seems that different factors, mainly cultural differences such as family and community support and expectations from each gender, play an important role in QoL of both females and males (29).

Findings of the current study were consistent with those of Khayatzadeh *et al.*, and Ahlsio *et al.*, regarding no relationship between QoL and time elapsed from stroke (17, 32). Also, results of the current study about lack of association between the involved side of the body and QoL in patients with stroke were in agreement with those of Khaatzadeh *et al.* (32). A few studies investigated the effect of affected side of the body on QoL, although their results were contradicted. In a study by Patel *et al.*, right hemisphere lesions were suggested as a determinant and predictive factor for lower QoL (31).

Samsa and Matchar believed that controversies in the results of these studies also may be due to the miscellaneous instruments used to measure QOL and inconsistency of stroke severity (34). They also added the role of different instruments used to measure QoL and inconsistency of severity and signs of stroke in various studies as other controversies in the results of similar studies (35). The limitation of this study includes small sample size because of limited access to patients with stroke and the inability of some older patients to read and write (one of the inclusion criteria).

Conclusion

The current study aimed at evaluating the effect of functional independence on QoL in patients with chronic stroke. Hence, impact of different variables, such as independence in daily living activities, on QoL indicated the need for more attention of experts, particularly occupational therapists, to expedite independence in daily living activities in patients with stroke to improve their QoL. The results of the current study showed that stroke survivors need more attention to improve their independence in order to enhance QOL. In addition to routine rehabilitation services, psychological support may be mandatory for them to improve QOL.

It is recommended to evaluate the effect of functional independence on QoL in patients with acute stroke and compare the results with those with chronic stroke in further studies. Also, evaluation of the impact of mood changes and depression on the QoL of these patients should be investigated in further studies.

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References

1. Legg L, Drummond A, Leonardi-Bee J, Gladman J, Corr S, Donkervoort M, et al. Occupational therapy for patients with problems in personal activities of daily living after stroke: systematic review of randomised trials. Bmj 2007;335(7626):922
2. Schultz-Krohn W, Pendleton HM. Pedretti's occupational therapy: practice skills for physical dysfunction. Philadelphia: Mosby; 2006.
3. Roley SS, Barrows CJ, Susan Brownrigg OTR L, Sava DI, Vibeke Talley OTR L, Kristi Voelkerding B, et al. Occupational therapy practice framework: Domain & process 2nd edition. American journal of occupational therapy 2008;62(6):625
4. Chong DK-H. Measurement of instrumental activities of daily living in stroke. Stroke. 1995;26(6):1119-22
5. Robinson-Smith G, Johnston MV, Allen J. Self-care self-efficacy, quality of life, and depression after stroke. Archives of physical medicine and rehabilitation 2000;81(4):460-4.
6. Kim P, Warren S, Madill H, Hadley M. Quality of life of stroke survivors. Quality of life Research. 1999;8(4):293-301
7. Jaracz K, Kozubski W. Quality of life in stroke patients. Acta Neurologica Scandinavica 2003;107(5):324-9
8. Jönsson A-C, Lindgren I, Hallström B, Norrving B, Lindgren A. Determinants of quality of life in stroke survivors and their informal caregivers. Stroke 2005;36(4):803-8
9. Harper A. Development of the World Health Organisation WHOQOL-BREF quality of life assessment. Psychological medicine 1998;28(3):551-8
10. Rahimy M, Khayer M. The pattern of communication and quality of life for high school students in Shiraz. Journal of Educational Studies and Psychology University of Mashhad 2007;1:5-25
11. Viitanen M, Fugl-Meyer K, Bernspång B, Fugl-Meyer AR. Life satisfaction in long-term survivors after stroke. Scandinavian journal of rehabilitation medicine 1988;20(1):17-24
12. Hyland ME. Health and values: The values underlying health measurement and health resource. Psychology & Health 1997;12(3):389-403
13. Kagawa-Singer M, Padilla GV, Ashing-Giwa K. Health-Related Quality of Life and Culture. Seminars in Oncology Nursing 2010;26(1):59-67.
14. Ones K, Yilmaz E, Cetinkaya B, Caglar N. Quality of life for patients poststroke and the factors affecting it. Journal of Stroke and Cerebrovascular Diseases 2005;14(6):261-6.
15. Fattahi A, Azad A, Montazeri A. Quality of life among stroke patients in kermanshah city.Journal of Modern Rehabilitation 2008;Mar 1;1(2):1-6
16. Raju RS, Sarma PS, Pandian JD. Psychosocial problems, quality of life, and functional independence among Indian stroke survivors. Stroke 2010;41(12):2932-7
17. Ahlsiö B, Britton M, Murray V, Theorell T. Disablement and quality of life after stroke. Stroke 1984;15(5):886-90
18. Nejat S, Montazeri A, Holakouie Naieni K, Mohammad K, Majdzadeh S. The World Health Organization quality of Life (WHOQOL-BREF) questionnaire: Translation and validation study of the Iranian version. Journal of School of Public Health and Institute of Public Health Research 2006;4(4):1-12
19. Nedjat S, Montazeri A, Holakouie K, Mohammad K, Majdzadeh R. Psychometric properties of the Iranian interview-administered version of the World Health Organization's Quality of Life Questionnaire (WHOQOL-BREF): a population-based study. BMC Health Services Research 2008;8(1):1
20. Pendleton H, Schultz-Krohn W. Pediatrics occupational therapy: Practice skills for physical dysfunction. 2006.
21. Haghgoo HA, Pazuki ES, Hosseini AS, Rassafiani M. Depression, activities of daily living and quality of life in patients with stroke. Journal of the neurological sciences 2013;328(1):87-91
22. King G, Lawm M, King S, Rosenbaum P, Kertoy MK, Young NL. A conceptual model of the factors affecting the recreation and leisure participation of children with disabilities. Physical & occupational therapy in pediatrics 2003;23(1):63-90
23. Hartman-Maeir A, Soroker N, Ring H, Avni N, Katz N. Activities, participation and satisfaction one-year post stroke. Disability and rehabilitation 2007;29(7):559-66
24. Mayo NE, Wood-Dauphinee S, Coˆte R, Durcan L, Carlton J. Activity, participation, and quality of life 6 months poststroke. Archives of physical medicine and rehabilitation 2002;83(8):1035-42
25. Hackett ML, Duncan JR, Anderson CS, Broad JB, Bonita R. Health-related quality of life among long-term survivors of stroke results from the Auckland stroke study, 1991–1992. Stroke 2000;31(2):440-7
26. Choi-Kwon S, Choi JM, Kwon SU, Kang D-W, Kim JS. Factors that affect the quality of life at 3 years post-stroke. Journal of Clinical Neurology 2006;2(1):34-41
27. Jafari M, Dalvandi A. Quality of Life of Stroke Survivors and its Related Factors Iran Journal of Nursing (IJN) 2014;27(87):14-22
28. Carod-Artal FJ, Trizotto DS, Coral LF, Moreira CM. Determinants of quality of life in Brazilian stroke survivors. Journal of the Neurological Sciences 2009;284(1):63-8
29. Torfi K A, Birgani A G, K Z, S F. Assessment of Life Quality and Mental Health in Patients with Brain Stroke in Tehran Shariati Hospital in 2009-2010. Jundishapur J Chronic Dis Care 2012;1(1)
30. Sturm JW, Donnan GA, Dewey HM, Macdonell RA, Gilligan AK, Srikanth V, et al. Quality of life after stroke the North East Melbourne stroke incidence study (NEMESIS). Stroke 2004;35(10):2340-5
31. Patel M, McKevitt C, Lawrence E, Rudd A, Wolfe C. Clinical determinants of long-term quality of life after stroke. Age and Ageing 2007;36(3):316-22
32. Khayatzadeh-Mahany M, Goharpei S, Rostami HR, Jahantabinezhad S. Comparative Study of Quality of Life in Stroke Patients in Ahwaz. Zahedan Journal of Research in Medical Sciences 2012;14(2):86-90
33. Kuroda A, Kanda T, Sakai F. Gender differences in health-related quality of life among stroke patients. Geriatrics & Gerontology International 2006;6(3):165-73
34. Samsa GP, Matchar DB. How strong is the relationship between functional status and quality of life among persons with stroke? Journal of rehabilitation research and development 2004;41(3):279
35. Nichols-Larsen DS, Clark P, Zeringue A, Greenspan A, Blanton S. Factors influencing stroke survivors' quality of life during subacute recovery. Stroke 2005;36(7):1480-4