Comparison of quality of life according to community walking in stroke patients

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Abstract. [Purpose] The aim of this study was to examine the quality of life of stroke patients according to their degree of community walking. [Subjects] This study utilized raw data from the sixth Korea National Health and Nutrition Examination Survey conducted in 2013 by the Korea Centers for Disease Control and Prevention. The subjects were noninstitutionalized stroke patients (n = 71) diagnosed by a doctor. [Methods] Trained surveyors visited households selected for the sample and conducted face-to-face interviews in conjunction with a structured questionnaire. The content of the interview included demographic data and the EuroQoL; EQ-5D-3L. Inferential statistical analysis took into account the clustering and stratification of the sample survey data as usually done in a complex survey design. A χ^2 test was performed to identify the quality of life distribution according to walking days during a typical week. Finally, logistic regression analysis was performed to identify the correlation between quality of life and walking days. [Results] Mobility, usual activities, and anxiety/depression differed significantly according to number of walking days during a normal week. No significant difference was found in the relationship between quality of life and days of walking during a normal week. [Conclusion] This study indicates that community walking every day is better than walking 1–3 days a week or no walking in terms of the effect on quality of life. However, the extent to which community walking is good for improving quality of life is unclear. Further studies need to determine the optimal duration (days) of community walking.
Key words: Community walking, Quality of life, Stroke

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INTRODUCTION

Strokes are the second most common cause of death in South Korea, and the burden of strokes has increased[1]. Stroke patients often live with a walking dysfunction caused by decreased mobility, weakened muscular strength, abnormal posture control, and cognitive dysfunction[2]. Walking is the most important factor for independent daily life in the community[3]. In particular, community walking is defined as a complicated and challenging activity requiring the ability to walk at a given speed for a minimum requisite distance and to adapt to changes in various environments[4]. Successful community walking determines the degree of social participation after hospital discharge.

By a year after stroke onset, physical functions are almost completely recovered; however, quality of life (QoL) decreases 40% compared with before a stroke[5]. Mayo et al. found that six months after a stroke, many patients still have social restrictions and lack meaningful activities, which could lead to deteriorations of QoL[6]. QoL focuses on the impact that an individual's perceived health status has on aspects of his or her life[7]. Compared with other chronic diseases, a stroke can be especially detrimental to a person's QoL[8]. Previous studies emphasized the importance of evaluating the degree of physical fitness (balance, falling, etc.) for the QoL of stroke patients[9–11]. However, the activities in these studies are different from community walking in a real environment, and investigations of walking as a physical function are insufficient. Therefore, this study examined QoL of stroke patients according to their degree of community walking.

SUBJECTS AND METHODS

This study utilized raw data from the sixth Korea National Health and Nutrition Examination Survey (KNHANES) conducted in 2013 by the Korea Centers for Disease Control and Prevention (KCDC). The sampling protocol for the KNHANES was designed to involve a complex, stratified, multistage probability cluster survey of a representative sample of the noninstitutionalized civilian population in South Korea by a cross-sectional design. The target population of the survey was comprised of noninstitutionalized South Korean civilians aged 1 year or older (n = 8,018).

This study used the data of stroke patients (n = 71) diagnosed by a doctor. Trained surveyors visited households selected for the sample and conducted using face-to-face interviews in conjunction with a structured questionnaire.

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Table 1. Characteristics of the stroke patients

Parameters		n*	%†	Parameters	n*	%†
Gender	Male	38	53.5	No walking	19	26.8
	Female	33	46.5	1–3 days	19	26.8
Age (years)	≤ 59	15	21.1	Walking days during a normal week in the community	4–6 days	12	16.9
	60–69	21	29.6	Every day	19	26.8
	70–79	24	33.8	I don't know	2	2.7
	≥ 80	11	15.5			

*Sample size. †Estimated percent of the population

Table 2. QoL distribution according to walking days during a normal week in the community

QoL		Walking days during a normal week in the community			
		No walking	1–3 days	4–6 days	Every day
Mobility*	No problem	15.8 (3.0)	18.9 (2.1)	17.0 (6.6)	45.7 (5.8)
	Having a problem	31.1 (3.0)	36.3 (4.3)	13.5 (3.2)	19.0 (4.9)
Self-care	No problem	24.8 (2.4)	25.6 (1.9)	13.4 (4.8)	34.6 (4.2)
	Having a problem	22.3 (3.9)	35.5 (6.5)	19.7 (6.4)	22.5 (7.1)
Usual activities*	No problem	16.5 (2.8)	27.1 (2.6)	12.5 (5.2)	41.1 (6.0)
	Having a problem	29.9 (2.5)	29.3 (3.4)	17.1 (2.1)	23.7 (4.1)
Pain/discomfort	No problem	15.7 (3.1)	31.4 (3.2)	21.6 (7.2)	30.0 (4.3)
	Having a problem	29.5 (3.3)	26.4 (3.0)	11.0 (2.9)	32.1 (4.2)
Anxiety/depression*	No problem	25.9 (3.0)	21.8 (2.3)	12.6 (3.7)	38.1 (3.7)
	Having a problem	18.7 (2.4)	48.2 (7.4)	22.8 (8.5)	10.3 (5.8)

*$p<0.05$. Values are numbers with percentages in parentheses.

The content of the interview included demographic data and the EuroQoL, EQ-5D-3L (3 level version of the EuroQoL 5-dimensional questionnaire)[12, 13]. The demographic data addressed questions regarding age, gender, and walking days during a typical week in the community (e.g., walking for work or school, mobility, and exercise participation for more than 10 minutes). The KNHANES's protocol was reviewed and approved by the institutional review board of the KCDC (IRB no. 2013-07CON-03-4C). The general characteristics of the subjects are presented in Table 1. Of the subjects, 38 (53.5%) were male and 33 (46.5%) were female. The subjects were divided into four age groups: ≤ 59 years (21.1%), 60–69 years (29.6%), 70–79 years (33.8%), and ≥ 80 years (15.5%). Walking days during a week in the community were divided into four groups by quartile: no walking (26.8%), walking 1–3 days a week (26.8%), walking 4–6 days a week (16.9%), and walking every day (26.8%).

The EQ-5D-3L was used to evaluate the subjects. The subjects were instructed to respond to five items on mobility, self-care, usual activity, pain/discomfort, and anxiety/depression and rate the items using a 3-point Likert scale (no problem, moderate problem, or extreme problem). To determine the QoL distribution according to walking days during a normal week in the community, QoL was categorized as "no problem" and "having a problem" for the five items. The expected frequency of "extreme problem" was lower than 5.

The collected data were analyzed with SPSS Statistics 21.0 (IBM Corporation, Armonk, NY, USA). Inferential statistical analysis took into account the clustering and stratification of the sample survey data as usually done in a complex survey design. Individual weights were applied in order to estimate populations. A frequency analysis was performed to examine the distribution of subjects. A χ^2 test was performed to identify the QoL distribution according to walking days during a typical week. Finally, logistic regression analysis was performed to identify the correlation between QoL and walking days. The statistical significance level for statistical testing was $\alpha = 0.05$.

RESULTS

Mobility, usual activities, and anxiety/depression differed significantly according to number of walking days during a normal week. For mobility, 45.7% of patients who walked every day reported "no problem," whereas 15.8% of patients who did not walk at all reported "no problem" ($p = 0.006$). For usual activities, 41.1% of patients who walked every day reported "no problem," whereas 16.5% of patients who did not walk at all reported "no problem" ($p = 0.016$). For anxiety/depression, 38.1% of patients who walked every day reported "no problem," whereas 25.9% of patients who did not walk at all reported "no problem" ($p = 0.019$) (Table 2). No significant difference was found in the relationship between QoL (mobility, B = 0.981, $p = 0.071$; self care, B = −0.799, $p = 0.591$; usual activities, B = 0.889, $p = 0.180$; pain/depression, B = 0.752, $p = 0.481$; anxiety/depression, B = −0610, $p = 0.154$) and days of walking during the week (Table 3).

Table 3. Results of logistic regression analysis of QoL

QoL	B	SE	Wald	Exp (B)
Mobility	0.981	0.497	3.357	2.666
Self-care	−0.799	0.294	0.292	0.450
Usual activities	0.889	0.476	1.830	12.432
Pain/discomfort	0.752	0.471	0.503	2.121
Anxiety/depression	−0.610	0.496	2.078	0.5444

DISCUSSION

Walking dysfunction of stroke patient influences activities of daily living and QoL negatively[14]. The aim of this study was to compare with QoL according to community walking in stroke patients. The results showed that stroke patients who walked every day were significantly more likely than stroke patients who did not walk to have "no problem" with mobility, usual activities, or anxiety/depression. Generally, frequent performance of rapid walking in stroke patients positively influences function recovery because it is based on motor learning theory[15, 16]. However, investigation of repetition of walking revealed that the number of days of walking had no significant effect on QoL in this study. In previous studies, patients compared with control groups, community walking positively influenced activities of daily living, QoL, and social participation in stroke[17, 18]. In addition, the experimental group that performed community walking in the study of Gordon et al. showed improvement in activities of daily living and general physical health compared with the study's control group, which did not perform community walking[19]. However, the experimental group did not show a significant change in activities of daily living, physical health, or mental health at 6 weeks and 3 months. The results of the current study were similar. Thus, this study indicates that community walking every day is better than walking 1–3 days a week or no walking in terms of the effect on QoL. However, the extent to which community walking is good for improving QoL is unclear.

The study had some limitations. First, data accuracy could not be maximized through data segmentation because KNHANES data were used instead of data collected exclusively to analyze stroke and QoL[20]. Second, while the KNHANES data included community walking during the week, much of the data could not be analyzed because of nonresponse to relevant items. Further studies need to determine the optimal duration (days) of community walking.

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