

A Study on Health-related Factors on Wellness of Stroke Patients Living in Community

Hyeong-Min Kim¹, Hwan, Kim^{2*}

¹Professor, Department of Occupational Therapy, Gimcheon University 214 Daehak-ro, Gimcheon City, Gyungbuk, 39528, Republic of Korea

²Professor, Department of Occupational Therapy, Daegu University 201 Daegudaw-ro, Jillyang-eup, Gyeongsan-si, Gyeongsangbuk-do, 38453, Republic of Korea

Corresponding author*: Hwan Kim, E-mail: hwan.kim@daegu.ac.kr

ABSTRACT

This study sought to identify wellness and health-related factors of stroke patients living in the community and the relationship among the related variables and to prepare predictive factors and evidence for stroke patients to lead a healthy life in the community. Data were collected from 221 stroke patients living in the community. The subject's wellness was evaluated through the Korean Wellness Life Style Scale (KWLISS), and the health-related factors are used with a comprehensive ICF core set for stroke. Of the collected data, 192 subjects were analyzed, excluding 29 subjects who did not meet the criteria for selecting subjects. Among health-related factors, activity & participation, and environmental factors are important variables in improving the wellness of stroke patients residing in the community. In other words, activities & participation that are based on independence and autonomy and environmental factors including social support are essential for improving the wellness index of stroke patients living in the community. Since health-related factors cannot be easily changed by the ability of individual clients alone, the continuous interest of rehabilitation experts who are responsible for the wellness and health of stroke patients and occupation-based intervention approaches should be continuously implemented in the future.

Keywords

Activities and Participation, Environmental factors, ICF, Stroke, Wellness

1. Introduction

Recently, the concept of continuum for the paradigm of health has been changed from a medical paradigm to a wellness paradigm [1]. The medical paradigm is defined as a concept of the intermittent and passive interactions of people with poor health with the doctor to treat and control their diseases and improve conditions [2]. Meanwhile, the wellness paradigm means people's lives, intentionally choosing their lifestyles to take the initiative to prevent diseases, improve health, and improve the quality of life and the sense of well-being [2].

Wellness refers to the art and science to help humans change their way of life to keep the optimum health conditions [3]. Although the definitions and theories of wellness may differ a little bit, depending on the model, concerning the definitions of the dimensions, it has been proven that five similar components (physical, social, psychological, intellectual, and emotional wellness) are in several models [4]. Most stroke patients may live a passive life within the concept of the medical paradigm. The reason is that stroke patients come to experience various problems such as loss of motor and sensory functions, communication disorders, cognitive and perceptual

impairment, and emotional change according to the location and degree of damage, and accordingly, they have a lot of restrictions in activity and participation [5].

Like this, the functional problems of stroke patients' Body function and structure, and environmental disturbances may have negative impacts on their participation in the local community [6]. Moreover, in stroke patients, the number of meetings with neighbors and friends, excluding family, sharply decreases as time passes by, and they experience limitations in social activity outside their houses [7].

Occupational therapy experts can play a key role in improving the health of the public through prevention and wellness by approaching communities and institutions and controlling chronic diseases, including stroke, altogether [8]. Since the local community is the optimum place that can help improve habits necessary for clients' health care and their participatory skills, occupational therapists are very likely to gradually participate in the health and wellness programs in the local community [9].

In the occupational therapy literature, wellness is often discussed [10]. To examine wellness-related studies, research on the meaning of wellness to the elderly, on changes with the wellness/health promotion program, on participation in leisure activity of the elderly, on the degree of participation in exercise, and the correlation between lifestyle and health promotion behavior has been conducted [11-15]. Most of the preceding studies report that leisure activity and physical activity would increase the wellness index. However, most of them were concerned with the elderly and the therapeutic effects or concepts of the application of the wellness program. Despite the necessity of complex and horizontal approaches is raised, considering the situational factors experienced by stroke patients, few empirical studies have been conducted on stroke patients' health and wellness, and there are far more insufficient studies of the comprehensive assessment of health and wellness [16].

Social minorities including stroke patients live by the help in many ways under social norms and institutions; however, they still have difficulties in participating in the work successfully [17]. Occupational therapy can develop related goals as well as affect clients' health and wellness through successful work and participation in the activities [18]. Moreover, occupational therapy experts can meet the goals of wellness and health promotion by helping the clients with various methods [10]. Thus, this study would check the holistic health conditions of stroke patients living in the local community through the comprehensive ICF core set for stroke drawn by Geyh et al. [19] through the consensus process of international experts.

2. Methods

2.1 Research subjects and data collection procedures

The population of this study was stroke patients who visited public health centers or welfare centers for the disabled, and sports facilities for the disabled, residing in Seoul, Gyeonggi-do, Ulsan, Busan, Daejeon, and Gwangju. The concrete criteria for the selection of the research subjects are as follows.

- 1) Stroke patients who understood the purpose of this study and agreed with the survey;
- 2) Those who understood the contents of the questionnaires, could respond to them and agreed to participate in the research in writing;
- 3) Those who could answer the questions asked by the research assistant if it would be difficult to fill out the survey themselves; and
- 4) Those who led their lives in the local community instead of the hospital.

Data were collected by three researchers, two doctors and one master majoring in occupational therapy, who belonged to an ICF-related research society, held a related degree and experienced the submission of academic papers. The three researchers discussed the following matters through meetings three times before collecting the data. First, they understood the meanings and common characteristics of the items constituting the assessment of the comprehensive ICF core set for stroke; second, they interpreted the ICF codes by the method of combination of alphabet and numeric codes; third, they prepared measures for coping with the unexpected situations and errors that might occur during the assessment process; and fourth, they made efforts to secure consistency in the assessment process, e.g. They became well-acquainted with the metrics of the qualifier of each assessment item and the manual on the classification scales.

The data collection took about 40 minutes per person, and by checking the collected data, if there were missing items or unclear responses, the researchers contacted the subjects again to modify or supplement them or excluded them from the final questionnaires. A total of 221 research subjects were assessed, and 192 persons in total were finally analyzed, excluding 29 subjects who wanted to quit participating in the research while they were drawing up the questionnaire and those whose unreliable responses made the analysis impossible.

2.2 Ethical considerations of the research subjects

This study collected data after getting approval from the 'Daegu University Institutional Review Board' for the ethical considerations of the participants (Approval No.: 1040621-201411-HR-028-02). The subjects who participated in the research, meeting the criteria approved by Daegu University Institutional Review Board were included as the research subjects only if they agreed to participate in the research in writing themselves. To protect the research subjects' safety and rights in drawing up the research consent form, the contents of confidentiality and anonymity were included, and they were convinced that they would be able to withdraw anytime if they wanted to quit participating in the research while they were drawing up the questionnaires after agreeing to participate in the research and they were being assessed. In addition, notification was made that the subjects' personal information obtained through the research would only be utilized for statistics generation, and no information individuals could tell would not be disclosed.

2.3 Dependent variable: Wellness

To measure the dependent variable of this study, Korean Wellness Life Style Scale (KWLISS) was applied. The wellness scale is the lifestyle scale developed by Kim [20] for situations in Korea based on the Lifestyle Assessment Inventory (LAI) developed by Anspaugh, Hamrick, & Rosato [21]. It consists of a total of 55 items with five sub-items including physical wellness (17 questions), social wellness (10 questions), psychological wellness (9 questions), intellectual wellness (9 questions), and emotional wellness (10 questions). The form of response to the

questionnaire on each factor is on a five-point Likert scale (1: Strongly disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly agree), and the higher the degree of their agreement, the higher their wellness condition becomes. The wellness variable was finally analyzed by correcting with grand-mean centering. The main index representing the internal consistency at the time of the development of the inventory, Cronbach's Alpha coefficient was .72-.87.

2.4 Independent variable: Health-related factors

To measure the independent variable of this study, the comprehensive ICF core set for stroke was utilized. The ICF developed based on the mutual correlations of health with all health components is effective for establishing rehabilitation plans and strategies through understanding the disability issues from a comprehensive perspective and comparing various health areas. The comprehensive ICF core set for stroke is the ICF core set developed by Geyh et al. [19], considering the peculiarity of stroke disease in the ICF codes. Reducing the ICF codes according to various purposes of the users, ICF Core Sets were developed as valid inventories. Geyh et al. [19] extracted key indicators for stroke patients in 130 items, of the 1,454 ICF items in total through the process of reaching consensus by international experts. This consists of 41 items of Body function; five, of body structure; 51, of activity and participation; and 33, of environment. Of them, the activity and participation areas are assessed with the performance qualifier, and environmental factors are assessed with barriers and facilitators. The health-related variables were finally analyzed by correcting them with grand-mean centering.

2.5 Control variables

This study controlled the socio-demographic characteristics that were expected to affect wellness. The preceding studies set sex, age, educational background, monthly income, marital status, religion, and period of residency as control variables. This study too set sex, age, educational background, marital status, the number of children, housing type, economic level, and onset as control variables, of the socio-demographic characteristics of stroke patients living in the local community, considering this.

2.6 Data analysis method

The data collected in this study were analyzed using the statistical techniques as follows through SPSS WIN 18.0 after going through coding and the review process for data errors, etc. To check the correlations among the main variables affecting the research subjects' wellness, Pearson's correlation coefficient was applied. Fifth, to check the causality of the factors affecting the wellness of stroke patients living in the local community, a hierarchical regression analysis was conducted.

3. Results

3.1 General characteristics of study subjects

Descriptive statistics were used to identify subjects' general characteristics. By the sex of stroke patients living in the local community, there were more men than women with 115 men and 77

women. By age, most of them (78 persons) were in their 50s, and by educational background, most of them were high school graduates (90 persons). By marital status, more people (159 persons) were married, and by the number of children, most of them (144 persons) responded that they had two or three children. By housing type, most of the stroke patients resided in an apartment (102 persons), and most of them responded that their economic level was average, and by the onset, most of them (124 persons) had it for more than six years (Table 1).

Table 1. Demographic sociological characteristics(N=192)

Categories		Frequency (persons)	Percentage(%)
Gender	Male	115	59.9
	Female	77	40.1
Age	≤40y	18	9.4
	50y	78	40.6
	60y	64	33.3
	≥70y	32	16.7
	≤Elementary	36	18.8
Education	Middle school graduation	18	9.4
	High school graduation	90	46.9
	≥University graduation	48	25.0
Economic level	Dissatisfied	52	27.1
	Average	77	40.1
	Satisfied	63	32.8
Onset period	< 1	6	3.1
	1 - 2	20	10.4
	2 - 3	31	16.1
	4 - 5	11	5.7
	≥6	124	64.6

3.2 Correlation between Wellness sub-area and health-related factors

To understand the relative impacts among wellness sub-area, health-related factors, Pearson's correlation coefficient analysis was conducted to check the correlations among the variables. As a result, the wellness of stroke patients living in the local community had negative correlations with activity&participation($r=-.164$, $p<.05$) while it had positive correlations with environmental factors($r=.244$, $p<.01$)(Table 2).

Table 2. Correlation between Wellness sub-area and health-related factors(N=192)

	Wellness Total	Physical Wellness	Social Wellness	Spiritual Wellness	Intellectual Wellness	Emotional Wellness
Body Function	-.012	.215**	.082	.084	-.434***	-.046
Body Structure	-.057	.140	.013	.012	-.408***	-.015
Activities & Participation	-.164*	.186*	-.116	-.057	-.474***	-.279***
Environmental Factor	.244**	.217**	.285***	.188**	.099	.155

* $p < .05$, ** $p < .01$, *** $p < .001$

3.3 Factors Affecting Wellness

To examine if the health-related factors of stroke patients living in the local community affect wellness, a hierarchical regression analysis was conducted, using age, educational background, marital status, the number of children, and the economic level as control variables, according to which there were statistically significant difference in wellness, of the socio-demographic characteristics. To conduct the regression analysis, the auto-correlation of dependent variables and the multicollinearity of independent variables were examined. The multicollinearity among the independent variables was analyzed using tolerance and Variance Inflation Factor (VIF), and as a result, tolerance was more than .10, and VIF, less than 10, so there was no multicollinearity. To verify the independence of the residual, the Durbin-Watson test was conducted, and as a result, the d value was 2.380, so there was no auto-correlation(Table 3).

Model 1 assessed the impacts on wellness by entering age, educational background, marital status, the number of children, and the economic level as control variables, of the socio-demographic characteristics. Of them, educational background, marital status, and economic level were converted to dummy variables for analysis. Model 2 checked if body function and structure would affect wellness after controlling exogenous variables by additionally entering the body function and body structure, of the independent variables, health-related factors. As a result of an analysis, with $F=26.74(p<.001)$ in Model 1 and $F=23.24(p<.001)$ in Model 2, this regression model is appropriate. Change in R^2 increased by 0.019 from 0.519 in Model 1 to 0.538 in Model 2. With significance probability $p=0.009$ according to change in $F(F=4.805)$ of R^2 , body function and body structure after entering the control variables are statistically significant in explaining wellness. As a result of the regression coefficient test of Model 1, age, educational background lower than elementary school graduation, middle school graduation, and dissatisfaction had statistically significant impacts on wellness. As a result of the regression coefficient test of Model 2, body function and body structure had statistically significant impacts on wellness(Table 3).

Model 3 checked if activity and participation would affect wellness even after controlling exogenous variables by additionally adding activity and participation, of the independent variables, health-related factors. As a result of an analysis, this regression model was appropriate with $F=23.04(p<.001)$ in Model 3. With $R^2=0.538$ in Model 2 and $R^2=0.559$ in Model 3, the change in R^2 increased by 0.021. With significance probability $p=0.002$ according to change in $F(F=9.739)$ of R^2 , after entering control variables, independent variables, that is, activity and participation are statistically significant in explaining wellness. As a result of the regression coefficient test of Model 3, activity and participation($t=-3.121$, $p=0.002$) had statistically significant impacts on wellness.

Model 4 checked if environmental factors would affect wellness even after controlling exogenous variables by additionally adding environmental factors, of the independent variables, health-related factors. As a result of an analysis, this regression model is appropriate with an F value of $22.17(p<.001)$ in Model 4. With $R^2=0.559$ in Model 3 and $R^2=0.571$ in Model 4, the change in R^2 increased by 0.012. With significance probability $p=0.017$ according to change in $F(F=5.852)$ of R^2 , after entering the control variables, the independent variables, environmental factors are statistically significant in explaining wellness. As a result of the regression coefficient test of Model 4, environmental factors($t=2.419$, $p=0.017$) had statistically significant impacts on wellness(Table 3).

Table 3. Factors Affecting the Wellness (N=192)

	Model 1	Model 2	Model 3	Model 4
	B	B	B	B
Age	-.024***	-.022***	-.027***	-.029***
≤Elementary	-.221*	-.294**	-.301**	-.239*
Middle school graduation	-.471***	-.415***	-.422***	-.513***
High school graduation	.025	-.007	-.006	-.027
Married status	-.127	-.088	-.068	-.098
Number of children	.056	.037	.077*	.092*
Dissatisfied Economic level	-.318***	-.414***	-.279**	-.161
Average Economic level	-.082	-.091	-.073	-.042
Body Function		-.421**	.012	-.016
Body Structure		.191*	.155	.129
Activities & Participation			-.295**	-.294**
Environmental Factor				.209*
Constant	4.69	4.76	4.91	4.89
F(p)	26.74***	23.24***	23.04***	22.17***

Adjust R ²	.519	.538	.559	.571
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* $p < .05$, ** $p < .01$, *** $p < .001$

Reference group : Education* $\geq$ University graduation, Marital status*Married,Economic level*Satisfied

4. Discussion

In the U.S. Occupational Therapy Practice Framework (OTPF-4), health and wellness are classified as concepts put under health care and maintenance [22]. Health care means the activity to develop, manage and maintain a routine for health and wellness promotion. ICF developed based on the mutual correlations among the health components is effective for understanding stroke patients' disability issues from a holistic perspective and rehabilitation planning and strategy establishment through comparisons of various health areas. In this background, this study employed a comprehensive ICF core set for stroke to understand the health-related factors of stroke patients living in the local community and the Korean Wellness Life Style Scale (KWLISS) to assess the wellness index [23].

This study conducted a hierarchical regression analysis to understand the variables affecting the wellness of stroke patients living in the local community. Model 2 additionally entered Body function and body structure after controlling exogenous variables. As a result of an analysis, this regression model is appropriate with $F=26.74(p<.001)$ in Model 1 and $F=23.24(p<.001)$ in Model 2. Change in R^2 increased by 0.019 from 0.519 in Model 1 to 0.538 in Model 2. With significance probability $p=0.009$ according to the change in F of R^2 , Bodyfunction($t=-2.884$, $p=0.004$) and body structure($t=2.054$, $p=0.041$) are statistically significant in explaining wellness after entering the control variables. This result supports Kwon [24] who reported that stroke patients' paralyzed region affected the quality of life. These studies reported that it would be necessary to consider the paralyzed region, stroke patients' body structure to improve the quality of life. In the ICF, the body structure is defined as the anatomical parts of the body, including human organs, limbs, and their components. Since stroke patients' body structure problems like these make it difficult performance for all activities of daily living, continuous rehabilitation is required, and they should be considered for improving wellness.

Model 3 checked if activity and participation would affect wellness even after controlling exogenous variables by entering activity and participation, of the independent variables, health-related factors. As a result of an analysis, the regression model is appropriate with $F=23.04(p<.001)$ in Model 3. In addition, change in R^2 increased by 0.021 with $R^2=0.538$ in Model 2 and $R^2=0.559$ in Model 3, and the independent variables, that is, activity and participation($t=-3.121$, $p=0.002$) were statistically significant in explaining wellness after entering the control variables with significance probability $p=0.002$ according to change in F of R^2 . This result is consistent with Holt-Lunstad, Smith, & Layton [25] who reported that the impact of social participation on wellness would be as important as the impacts of exercise, diet, smoking, and drinking alcohol. Moreover, it supports Mulry, Papetti, Martinis, & Ravinsky [26] who reported that participation in the local community allows a community of faith, leisure activity, social participation, and role fulfillment, which improves the quality of life and wellness. The participation of clients who live in the local community in meaningful work correlates with wellness. Participation in the work based on activity and participation may have a positive impact

on wellness by preventing negative impacts on physical and psychological health due to negative social isolation and restricted mobility.

Model 4 checked if environmental factors according to the controlling exogenous variables had a statistically significant impact on wellness after entering them, of the independent variables. As a result, the environmental factors($t=2.419$, $p=0.017$) were statistically significant in explaining wellness. Since there was a difference in the concepts of dependent variables to ultimately see, direct comparison is difficult; however, several preceding studies [27-28], too, report that family function degree and social support affected the quality of stroke patients' life, showing results similar to that of this study. These results of the preceding studies and this study suggest that of the environmental factors, immediate family members' social support is a very important variable in improving the wellness of stroke patients living in the local community. It would be necessary to prepare a measure for increasing social support for stroke patients in approaching wellness promotion in the future, and in particular, education and practical support for immediate family members would help recover stroke patients' functions.

This study has significance in that it was possible to check multi-factorial factors since it applied a comprehensive ICF core set for stroke that reflected the peculiarity of stroke disease well. And yet, there are a few limitations in the process of conducting this study, which should be supplemented through the subsequent study. The limitations and suggestions of this study are as follows. First, since there were many items in the comprehensive ICF core set for stroke to measure the independent variables, it took a long time to assess them, so the subjects had difficulty concentrating on it. Accordingly, many samples were dropped out in the data collection. In addition, in the assessment process, the subjectivity of the researcher's opinions could not be ruled out. Second, this study observed and measured the subjects at a certain point in time through a cross-sectional study. It would be necessary to conduct a longitudinal analysis considering the comprehensive interactive features among the health-related factors affecting wellness, that is, ICF components in the subsequent study.

5. Conclusions

The main variables the occupational therapist should consider to improve the wellness index of stroke patients living in the local community would be activity and participation, and environmental factors. Activity and participation based on independence and autonomy, and environmental factors including social support would be the matters essential for improving the wellness index of stroke patients living in the local community. Recently, it is necessary to make a rehabilitation approach with changes in the wellness paradigm. It would be necessary to conduct a continuous study of health and wellness for preparing the factual ground that can prove the necessity of occupational therapy in the future.

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