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Original Research

Evaluation of Self Efficacy and Quality of Life of Stroke Patients

İnmeli Hastalarda Öz Etkililik ve Yaşam Kalitesinin Değerlendirilmesi

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ABSTRACT

Aim: Self-efficacy and quality of life affect each other positively. However, level of self-efficacy and quality of life and their relation to recovery of stroke patients are unclear. The study was designed as a methodological and randomized controlled experimental study to analyze self-efficacy and quality of life of stroke patients.

Methods: The population of the study included stroke patients who received outpatient care at an acute stroke center between March – November, 2016. The study was performed with 72 patients. The patients in the experimental group received educational booklet and were included in a 3-month follow-up. The data for the study were collect using a Questionnaire Form, Quality of Life Scale for Stroke Patients, SSEQ and Monthly Follow-up Form. Standard tests, Tukey test, and regression and correlation analyses were used to analyze the data.

Results: It was determined that the experimental group given the educational booklet and monthly follow-up had higher scores in both self-efficacy and quality of life than the patients in control group. In the experimental group, the analysis between total scores from SSEQ and SS-QOL demonstrated increased correlation coefficient for the second visit compared with the first visit. Self-efficacy was positively correlated with the mobility, upper extremity function and self-care domains, and was negatively correlated with the language domain.

Conclusion: As a result, it was determined that education and follow-up in stroke patients are effective and has positive impact on self-efficacy and quality of life.

Key words: Nursing Intervention, Quality of Life, Patient Education, Self-Efficacy, Stroke

ÖZET

Amaç: Öz yeterlilik ve yaşam kalitesi birbirini olumlu yönde etkiler. Bununla birlikte, öz-etkililik ve yaşam kalitesi düzeyleri ve bunların inme hastalarının iyileşmesiyle ilişkisi belirsizdir. Çalışma, inme hastalarının öz-etkililiğini ve yaşam kalitesini analiz etmek için metodolojik ve randomize kontrollü deneysel bir çalışma olarak tasarlanmıştır.

Yöntem: Araştırmanın evrenini, Mart-Kasım 2016 tarihleri arasında akut inme merkezinde ayakta tedavi gören inme hastaları oluşturdu. Çalışma deney ve kontrol toplam 72 hasta ile yapıldı. Deney grubundaki hastalara eğitim kitapçığı ve 3 aylık takip girişimi uygulandı. Çalışmanın verileri Anket Formu, İnmeli Hastalar İçin Yaşam Kalitesi Ölçeği, SSEQ ve Aylık Takip Formu kullanılarak toplandı. Verilerin analizinde standart testler, Tukey testi ve regresyon ve korelasyon analizleri kullanıldı.

Bulgular: Eğitim kitapçığı ve aylık izlem uygulanan deney grubundaki hastalarda öz yeterlik ve yaşam kalitesi puanlarının daha yüksek olduğu belirlendi. Deney grubunda, SSEQ ve SS-QOL'den alınan toplam puanlar arasındaki korelasyona bakıldığında, ilk görüşmeye kıyasla ikinci görüşmede artış olduğu görüldü. Öz-yeterlik, hareketlilik, üst ekstremite işlevi ve öz bakım alanları ile pozitif, dil alanı ile negatif korelasyon gösterdi.

Sonuç: Sonuç olarak inmeli hastalarda eğitim ve aylık takibin, öz-yeterlilik ve yaşam kalitesi üzerinde olumlu etkisi olduğu belirlendi.

Anahtar Kelimeler: Hasta Eğitimi, Hemşire Müdahalesi, İnme, Öz-Etkililik, Yaşam Kalitesi

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INTRODUCTION

Stroke is a medical condition associated with ischemic and hemorrhagic disruption of cerebral blood flow and is characterized by impairments of the cognitive, affective, motor and emotional functions of the central nervous system (Mozaffarian et al., 2015). The American Heart Association predicts an increased incidence of stroke in the coming years (Mozaffarian et al., 2015). The World Stroke Organization; signaled that more than 13 million new cases of stroke are diagnosis annually worldwide (Lindsay et al., 2019) Stroke is a major cause of disability and has a high rate of mortality (Harvey, Macko, Stein, Winstein, & Zorowitz, 2008). Following stroke, patients experience abrupt and dramatically changes in their daily living activities such as self-care and standing up, and they require substantial support from others in their daily care which affects their quality of life and self-efficacy (Korpershoek, van der Bijl, & Hafsteinsdóttir, 2011; Topçu & Oğuz, 2017). Quality of life is a complex concept as it is influenced by individuals' physical health, psychological state, level of independence, social relationships, beliefs and plans for the future. Self-efficacy is another factor that affects quality of life and recovery process of stroke patients (Topçu & Oğuz, 2017). Self-efficacy indicates patients' self-confidence and how successful they may be in overcoming the difficulties they will possibly experience in the future. Self-efficacy is influenced by success performance, verbal persuasion and physiological state of the individual as well as similar individuals' experiences (Bandura, 1982).

Dorothea E. Orem described in her theory that patients with poor self-care fail to meet their biological, physiological, developmental and social needs (Orem, Taylor, & Renpenning, 1995). Sister Callista Roy, another nursing theorist, suggests that the physiological needs, roles and health-related change components of self-efficacy can be managed through accordance and adaptation to the disease (Roy & Andrews, 1999). Supportive of nursing theorists, recent studies report a positive impact of higher levels of self-efficacy on patients' recovery processes (Jones, Partridge, & Reid, 2008; Korpershoek et al., 2011). Most stroke patients require guidance to adapt to the disease and achieve self-efficacy. Thanks to the recent advances in home-care services, patients can now receive as much support at home following discharge as they can in a hospital setting (Kirkevold, 2010). Nurses have many responsibilities in increasing quality of life and self-efficacy levels of stroke patients monitored at hospitals or at home. Patients may develop physical, sensorial and emotional problems following stroke. These problems have significant impact on patients' self-efficacy and quality of life levels (Mauk, 2012). Problems may lead to significant changes in patients' lives and may force them to acquire new skills (Jones & Riazi, 2011), at which stage nurses step in to manage patients' care and treatment, increase functional capability, offer solutions to the difficulties and problems encountered in the process, adapt to new circumstances, and involve the family and more importantly the patient to the process of care (Kirkevold, 2010). The objective of the nurse in this context is to maximize patients' capability and confidence, hence their self-efficacy and quality of life. It is known that success performance increases and self-efficacy levels are positively affected in patients who perform their self-care and receive positive feedback from their nurses. Methods to improve self-efficacy levels employed by nurses encourage stroke patients to perform their self-care (Robinson-Smith & Pizzi, 2003) also translate into improved levels of daily activities, easier coping and reduced levels of depression (Bandura, 1982; Jones & Riazi, 2011; Korpershoek et al., 2011; Johnston, & Allen, 2000).

Identifying patients' problems following stroke and finding, implementing and evaluating specific solutions to these problems are the responsibilities of the nurses. Furthermore, nurses manage several other variables including maintenance of activities of daily living, increasing success performance, adapting to changes, involving the family and/or social support mechanisms to the process, encouraging the patient and filling information gaps. Education on disease management given by nurses following stroke have favorable effects on quality of life, self-efficacy and recovery. Planning patients' educational needs require objective measurements to identify the current state and their needs (Lev et al., 2001; Robinson-Smith & Pizzi, 2003). The "Stroke Self-Efficacy Questionnaire" and "Stroke-specific Quality of Life Scale", which will be used for this study, are believed to offer benefits in determining stroke patients' self-efficacy and quality of life levels and provide guidance for nurses, who care for stroke patients as part of their practice, when they are planning education.

METHODS

Type of Research

The aim of the study was to analyze self-efficacy and quality of life of stroke patients. The study was design as a methodological and randomized controlled experimental study. Seventy-two patients receiving inpatient care in a stroke center and meeting the inclusion criteria were simple randomly assigned to the experimental and control groups. Random numbers table was utilized to ensure randomization. Sequence numbers given to patients at their presentation to the stroke outpatient clinic and bed numbers of hospitalized patients were used to form the experimental and control groups according to the randomized numbers. Patients were assigned to experimental and control groups by patients list which are prepared daily for use in the stroke center. Before the first visit, each patient included in the sample was described the aim and importance of the study. Visits were scheduled for patients in

both groups when they came to the outpatient clinic for month one checks.

Place of Research

It was done at the stroke patients who received outpatient care at an acute stroke center between March 1 and November 12, 2016.

Population and Sample of the Research

The study was performed with 72 patients (36 in the experimental, 36 in the control group) who met the inclusion criteria of the study. The inclusion criteria of the study were patients who are able to communicate in Turkish, have a Barthel Index score of 62 and above, with no more than one month passed since the stroke event, who had experienced the first stroke, had no significant problems with sight and hearing and were open to communication and cooperation. Patients experiencing an acute event that may negatively affect self-efficacy and quality of life during the course of data collection and those who had a second stroke over this period were excluded from the study.

Data Collection Tools

Data collecting tools were administered by the investigator to the experimental group patients attending the visits. The data were collected during face-to-face visits in an education room. Patients' educational needs were prioritized by the help of the scales utilized. Educations guided by the educational booklets developed by the investigators were given to patients and their relatives. The parts corresponding to the answers concerning the problems experienced by the patients following stroke were marked within the booklet. The patients were asked to read the marked parts first, then the whole booklet, at home. The patients in the experimental group were contacted with through telephone calls one and two months after the first visit. The questions the patients had about the booklet, treatment plan, interim follow-up times, things that can be done against the side effects of the medicines, and the health problems apart from stroke they experience were answered. In the third month after the first visit, the "Stroke Self-Efficacy Questionnaire" and "Stroke-specific Quality of Life Scale" were administered again to the patients in the experimental group through telephone calls and they were informed that data collecting phase has been completed. Patients in the experimental group were communicated with twice face-to-face and once through telephone calls.

The scales were administered to the control group patients who were scheduled visits after the first visit and returned to the outpatient clinic for the first month follow-up. Following data collection, the patients were informed that they will be called again after three months. The investigators performed no intervention to the control group patients during this three-month period. They were called at the end of three months and the scales were administered again. Patients in the control group were communicated with twice face-to-face and once through telephone calls.

The reason why we preferred the method of providing education using a booklet was that it was an educational approach that can be applied in the home setting, given the facts that the patients were restricted in their movement due to physical problems that develop following stroke, they are unable to come to the stroke center alone, and had transportation difficulties associated with living in a big city with heavy traffic, as well as the added material and non-material burden to caregivers.

The tools used for collecting the data were:

Questionnaire: It includes a total of 10 questions on age, sex, marital status, level of education, profession, stroke type, date at diagnosis, people the patient lives with, people assisting care and diagnosed chronic conditions.

The Stroke Specific Quality of Life scale (SS-QOL): The scale includes a total of 49 items and includes self-care, language, vision, mobility, work/productivity, upper extremity function, thinking, personality, mood, family roles, social roles and energy domains. Higher scores from the scale indicate good quality of life, whereas lower scores from the scale indicate poor quality of life (Williams, Weinberger, Harris, Clark, & Biller, 1999). The scale was adapted into Turkish by Hakverdioğlu and Khorshid in 2009. The total Cronbach's alpha value of the Turkish version of the scale was 0.97 (Hakverdioğlu & Khorshid, 2012).

The Stroke Self Efficacy Questionnaire (SSEQ): The scale, validity and reliability of which were established by Topçu and Oğuz is used to determine patients' self-efficacy in functions including walking, dressing, in-bed comfort following stroke. The total Cronbach's alpha value of the Turkish version of the scale was 0.93 (Topçu & Oğuz 2018). Including 13 questions in total, higher scores from the scale indicate good self-efficacy, whereas lower scores from the scale indicate poor self-efficacy (Jones et al., 2008).

Education Booklet for Patients with Stroke: Results of national and international studies on the education needs of stroke patients and their relatives were reviewed when planning the content of the book. Previous studies have reported an information gap regarding the psychosocial, emotional and behavioral problems of stroke patients and their relatives. International studies describe educational needs for functional changes, movement, nutrition, stress management, coping with emotional changes, symptom management, preventing stroke signs and potential complications, cause of stroke, its prevention, treatment and involvement in social activities (Denny, Vahidy, Vu, Sharrief, & Savitz, 2017; Kapucu, Türkan, & Fesci, 2009), although the order of importance varies. Studies in our country also report that patient relatives experienced problems in ensuring hygiene and

assuming the whole care of the patient following stroke and defined patient transfer, raising the patients, communication, bladder care, medications, emptying problems and personal care as the most problematic topics (Kapucu et al., 2009). Based on the literature, the content of our booklet was developed to include the definition of stroke and the causes for its occurrence, activities of daily living (breathing, nutrition, movement, emptying, sleep, personal care, dressing, pain management, drug use, sexual life); problems that may arise following stroke (aphasia, dysarthria, visual problems, depression, mood swings, cognitive difficulties, negligence on one part, returning to work, social life, driving, entertainment); lifestyle changes; things to do in emergencies and guidance for caregivers. The developed educational booklet was submitted for expert opinion before it was finalized. The booklet with a total of 43 pages was designed so that patients may read and understand it easily.

Evaluation of Data

The One-Sample Kolmogorov-Smirnov Test indicated that self-efficacy demonstrated normal distribution however quality of life variable did not. Therefore, parametric tests (t-test, one-way ANOVA) were used for self-efficacy and non-parametric tests (Mann-Whitney U Analysis, Kruskal-Wallis Test, Tukey Analysis) were used for quality of life. Correlation and multiple regression analyses were used to determine which of the quality of life domains were predicted by self-efficacy.

Ethical considerations

Ethics board of an Institute of Medical Sciences of a public hospital granted consent (protocol no. 124) for this study on 30.11.2015. Each patient participating in the study were provided with information on the purpose and duration of the study and what investigators expected of them. Informed consent forms that were prepared separately for the experimental and control groups, confirmation that the text was read by or for the patient, and written permissions were received. The patients were assured that they could withdraw from the study anytime, that their details would not be shared with any other party, and that they would not be charged any fee for the booklet or telephone calls. Following completion of the data collection phase, the patients in the control group were offered the booklet and those who wanted to receive a booklet were provided with one.

RESULTS

Of the patients in the control group, 33.3% were 55 to 64 years old, while 27.8% of the patients in the experimental group were 65 to 74 years old, with 27.8% of them being over 75 years of age. Male patients comprised 61.1% of the sample. Of the patients in the experimental and control groups, 97.2% were being treated for ischemic stroke. Seventy-five percent of the patients in the experimental group and 80.6% in the control group were married, care of 41.7% of the patients in the experimental group was undertaken by patients' spouses, while 41.7% of the patients in the control group performed their own care. Both in the experimental and control groups, 72.2% of the patients had a chronic condition; 33.3% of the patients in the experimental group had hypertension and diabetes mellitus, while 36.1%in the control group had hypertension. Based on the Barthel scores the patients received, 88.9% in the experimental group and 86.1% in the control group were moderately dependent. The experimental and control groups were not significantly different with respect to sex, stroke diagnosis, marital status, education, profession and person who helped after the stroke (p> .05).

When SS-QOL and SSEQ mean scores of the experimental and control groups were examined, the mean self-efficacy score of the experimental group in the first visit was 21.56±7.62 compared with 25.50±8.28 in the control group. Control group having a higher self-efficacy score in the first visit (p< .05). In the visit at the end of the third month, the experimental group had a higher self-efficacy score than the control group (p< .001) (Table 1). The experimental and control groups did not differ significantly in mean quality of life scores (p> .05). In the same visit, the experimental group has a quality of life score of 233.0±27.40 compared with 193.5±44.52 in the control group, demonstrating a better quality of life for the experimental group compared with the control group at the end of the third month (p< .001) (Table 1).

Table 1. Comparison of experimental and control groups SSEQ and SS-QOL total score (n=72)

Interview	[1]SSEQ		[2]SS-QOL			
	Experimental (n=36)	Control (n=36)	Experimental (n=36)	Control (n=36)	[c]MWa	p
[a]1st	M±SD 21.56±7.62	M±SD[a] 25.50±8.28	148.33±33.33 Median: 34	163.82±44.18 Median:39	-1.04	0.297
[b]2nd	35.67±5.84	31.06±6.79**	233.01±27.40 Median:44	193.54±44.52 Median:28	-3.30	**<0.001**

[1]Stroke Self Efficacy Questionnaire, [2]Stroke Specific Quality of Life,

[a]First interview, [b]Final interview, [c]Mann Whitney U testi, * t= -2.10, p= .03, ** t= +3.88 p= .001

The analysis to test the differences between mean scores received from SSEQ and SS-QOL before and after the experimental group was provided with educational booklet demonstrated a mean difference of 84.68 for SS-QOL at the end of the third month compared with 29.72 for the control group. For the other variable, SSEQ, the mean difference was 14.11 for the experimental group compared with 5.56 in the control group. The first and second visits were significantly different in the experimental group for both variables (p< .001) (Table 2).

Table 2. The difference among SSEQ and SS-QOL mean Scores (n=72)

Variable	M± SD		Mean Differences	t	p*
Experimental					
[1]SSEQ	[a]1st	[b]2nd			
	21,56 ±7,62	35,67 ±-5,84	-14.11	-13.46*	**0.00**
[2]SS-QOL	148,33±33,3	223,01±-27,41	-84.68	-16.10*	**0.00**
Control					
SSEQ	25,50±8,28	31,06±-6,79	-5.56	-7.59*	**0.00**
SS-QOL	163,82±44,18	193,54±-44,52	-29.72	-7.00*	**0.00**

[1]Stroke Self Efficacy Questionnaire, [2]Stroke Specific Quality of Life, [a]First interview, [b]Final interview, *p< .001

When the domains of SS-QOL were examined, the education given to the experimental group and the three-month follow-up resulted significantly higher mean scores from self-care, vision, mobility, work/productivity, upper extremity function, thinking, personality, mood, family roles, social roles and energy (p< .001) domains than the control group (Table 3).

Table 3. Comparison of the final interviews SS-QOL's subscales score between experimental and control groups (n=72)

[1]SS-QOL	Experimental (n=36) M±SD (median)	Control (n=36) M±SD (median)	z*	p
Self Care	21.77±4.01 (44.29)	18.40±5.22 (28.71)	-3.21	**0.000*****
Vision	14.75±0.76 (40.93)	13.61±2.22 (32.07)	-2.47	**0.013***
Language	23.55±2.79 (39.24)	21.72±4.51 (33.24)	-1.60	0.110
Mobility	28.05±3.80 (43.08)	23.86±6.27 (29.92)	-2.87	**0.004****
Work/Productivity	13.61±2.33 (43.61)	11.66±3.05 (29.39)	-3.07	**0.002****
Upper Extremity Fuction	21.66±4.70 (42.60)	18.7±5.80 (30.40)	-.85	**0.009****
Thinking	13.61±2.85 (44.07)	11.27±3.67 (28.93)	-3.25	**0.000*****
Personality	13.77±2.43 (42.13)	12.19±3.22 (30.88)	-2.50	**0.012***
Mood	22.63±3.09 (43.76)	19.80±4.90 (29.24)	-3.02	**0.002****
Family Roles	13.75±1.94 (43.40)	11.72±3.37 (29.60)	-3.01	**0.002****
Social Roles	22.36±3.12 (43.61)	18.52±5.73 (29.39)	-2.96	**0.003****
Energy	13.47±2.62 (41.39)	12.16±3.22 (31.61)	-2.17	**0.030***

[1]Stroke Specific Quality of Life, *Mann-Whitney U, *p< .05, **p< .01, ***p< .001

In the experimental group, the correlation analysis for SSEQ and SS-QOL total and domain scores show an increased coefficient for the second visit compared with the first visit. With SSEQ, the results of the first and second visits were similar for "vision and language" domains, whereas the correlation coefficient for the "mobility" domain was lower for the second visit compared with the first visit (Table 4).

Table 4. Correlation between SS-QOL Sub-groups and self efficacy in the experiment group (n=36)

[1]SS-QOL Sub-groups	First interview (r)	p	Final interview (r)	p
SS-QOL total score	0.70	0.00*	0.88	0.00*
Self Care	0.78	0.00*	0.86	0.00*
Energy	0.42	0.01*	0.74	0.00*
Social Roles	0.43	0.01*	0.74	0.00*
Upper Extremity Function	0.70	0.00*	0.88	0.00*
Family Roles	0.29	0.09	0.77	0.00*
Mood	0.30	0.08	0.71	0.00*
Personality	0.00	0.99	0.68	0.00*
Thinking	0.18	0.29	0.65	0.00*
Work/Productivity	0.82	0.00*	0.83	0.00*
Mobility	0.83	0.00*	0.78	0.00*
Vision	0.23	0.17	0.14	0.42
Language	0.09	0.61	0.23	0.17

[1]Stroke Specific Quality of Life, *p< .05,

In the second visit, a multiple regression analysis was run to predict SSEQ total score from "mobility, upper arm function, language and self-care". All variables were revealed in the multiple regression analysis as significantly associated with the SSEQ total score. Mobility, upper arm function and self-care variables correlated positively, language variable correlated negatively with SSEQ and accounted for 91% of the variance in the scale (Table 5).

Table 5. Experiment group association between [1]SSEQ and [2]SS-QOL sub-groups (n=36)

	First Interview				Final Interview			
Sub-groups	**β[a]**	**S(bi)[b]**	**t**	**p**	**B[a]**	**S(bi)[a]**	**t**	**p**
SSEQ	-1.37	3.28	-0.42	0.68	5.30	3.47	1.53	0.14
Mobility	0.77	0.17	4.62	0.00*	0.78	0.16	4.93	0.00*
Upper extremity function	-0.31	0.31	-1.00	0.33	0.32	0.13	2.43	0.02**
Language	0.11	0.12	0.84	0.40	-0.31	0.12	-2.63	0.01**
Self Care	0.85	0.36	2.35	0.03**	0.42	0.19	2.19	0.04**
Multiple regression	[c]*Modal R^2* : %73,6 *F test* : 21,58 *p* <0,05				[a]*Modal R^2* : %91,3 *F test* : 81,37 *p* <0,05			

[1]Stroke Self Efficacy Questionnaire, [2]Stroke Specific Quality of Life [a]Standardised Regression Coefficients, [b]Standart Error of Regression Coefficient, [c]R Squared, *p < .05

DISCUSSION

When the sociodemographic characteristics of the patients who participated in the study were examined, it was seen that the experimental and control groups consisted mostly of male patients. The incidence of stroke is higher among men worldwide, although the incidence among women is rising rapidly relative to men (Mozaffarian et al., 2015). When the age distribution of the experimental and control groups was examined, patients aged 65 years and older represented more than half of the total number of patients in both groups. Advanced age is an unmodifiable risk factor for stroke (Mauk, 2012), with ischemic stroke being especially more frequent in individuals aged 65 years and higher (Mozaffarian et al., 2015). Most of the participants in our sample were married. Published guidelines on stroke do not describe marital status as a risk factor for stroke, with no statements as to whether marital status increases or decreases stroke (Benjamin et al., 2017; Mozaffarian et al., 2015). In the control group, the majority of the patients performed their own care, whereas most patients in the experimental group received the support of their spouses for their care. No studies pointing out a link between stroke prevalence and profession and people assisting care were found in the literature (Mauk, 2012). Sociodemographic characteristics of the experimental and control groups were consistent with the literature.

Preventing occurrence of stroke and should it occur, making life easier for the patient are top priorities for nurses, regardless of sex, chronic conditions, etc. of the patient.

Effective outcomes are achieved with the education offered by nurses as part of disease management following stroke. There are reports in the literature that education programs lead to substantial improvements in patients' self-efficacy, played an important role in successfully managing the disease (Hafsteinsdóttir, Vergunst, Lindeman, & Schuurmans, 2011), decreased patients' distress and depressive symptoms (Lev et al., 2001; Lii, Tsay, & Wang, 2007) and hence provided cost-efficacy (Lii et al., 2007). Similarly, education given by nurses following stroke had a positive impact on patients' functional, psychosocial and emotional wellbeing (Nir, Zolotogorsky, & Sugarman, 2004) and increased their level of knowledge on the risk factors for stroke, level of self-efficacy and social involvement (Denny et al., 2017; Wang, Chen, Liao, & Hsiao, 2013). Nurses' interventions to enhance patients' self-efficacy following stroke are known to function as motivators for the patients in performing their selfcare efficiently. A direct link between high self-efficacy and favorable health outcomes has also been shown (Robinson-Smith & Pizzi, 2003). Likewise, education given by nurses following stroke has been shown to encourage healthy life behaviors, had positive impact on health perception and body image (Nir et al., 2004) and improved quality of life (Lev et al., 2001; Lii et al., 2007). In our study, consistent with the above reports, self-efficacy and quality of life of patients in the experimental group increased to a higher extent than the patients in the control group after the education and monthly follow-ups (Table 1). The test to determine whether this improvement was significant demonstrated a significant difference between the variables over the three-month follow-up (Table 2).

When the experimental and control groups' mean scores from SS-QOL domains after the three-month follow-up were examined, the score the experimental group had in the "language" domain was higher compared with the control group, but without a significant difference. Apart from language, mean scores from the other domains, i.e. self-care, vision, mobility, work/productivity, upper extremity function, thinking, personality, mood, family roles, social roles and energy were higher in the experimental group than in the control group (Table 3). About one-third of the patients experienced language difficulties after stroke. However, these problems may resolve in a short time and spontaneously in most patients experiencing language difficulties. Previous studies have described that recovery may occur in two months to one year in patients with persisting problems, adding that speech impediment may even be permanent in some patients. Thus, patients with speech impediment following stroke are reported to have poor quality of life (Glize et al., 2017). Speech therapists have a more prevalent role than nurses in treating speech impediment that develops post-stroke (Langhorne, Bernhardt, & Kwakkel, 2011). Because the patients in the experimental and control groups did not have the opportunity to receive speech therapy routinely and were not expected to have their speech impediment resolved in a short time, we did not expect to observe any changes in the language domain of quality of life with education and after three-month of follow-up when planning the study. The literature states that nurses' interventions lead to improvements in daily activities involving physical functioning such as mobility, self-care, upper extremity function, return to work, improved psychological and emotional functions including personality traits, temperament, thinking, social and familial roles (Kirkevold, 2010; Nir et al., 2004), energy (Westergren, Hallberg, & Ohlsson, 1999), and had an important role in planning daily life for patients with visual problems (Cacchione, 2007). The results of our study demonstrated that nursing interventions resulted in improvements in all domains of quality of life other than language in the experimental group compared with the control group, which was consistent with the literature (Table 3).

The correlation coefficient of quality of life and self-efficacy increased significantly after the education with the booklet given to the experimental group between the first and second visits. Similarly, the correlation coefficient between self-efficacy and self-care, energy, social roles, upper extremity function, family roles, mood, personality, thinking, work/productivity, domains indicate a very strong relationship. The effect of providing patients with education and a booklet on vision, mobility and language domains is constant (Table 4). This result supports that nursing interventions and nurses' training positive impact of quality of life and self-efficacy (Lev et al., 2001; Robinson-Smith et al., 2000; Robinson-Smith & Pizzi, 2003).

Multiple regression analysis also demonstrated that the variability in SSEQ total mean scores independently correlated with mobility, upper extremity function, language and self-care. The link connecting SSEQ score variability with those variables is indefinite in Turkish literature (Table 5). This is the first study showing the relationships between SSEQ and SS-QOL score. There are reports in the literature that the positive relationship between mobility and self efficacy and low self efficacy negative effect on daily living activities (Korpershoek et al., 2011). A study with patients who have hemiplegia, nursing interventions resulted in improvements patients' upper extremity functions (Kang, 2006). Similarly, high self efficacy affected to self-care, mobility and language (Kendall et al., 2007). Hence, it is important to investigate and explain the link connecting the two scales in further research.

CONCLUSION

Patients' self-efficacy and quality of life improved following three months of follow-up in the experimental group. All domains of quality of life expect the language domain was improved when compared with the control group.

When the relationship between quality of life domains and self-efficacy was examined, it was seen that the mobility, upper extremity function and self-care domains affected self-efficacy positively and the language domain affected self-efficacy negatively.

In conclusion, education and follow-up given to patients following stroke was effective and favorably affected patients' self-efficacy and quality of life.

Limitation

Research is limited to only stroke patients. Discontinuing patient education after three months and not being able to perform the first and second month follow-up visits face to face with the patients were the limitations of the study. In addition, short life expectancy for stroke patients and high risk of having a second stroke were considered as another limitation for the study.

Impact statement

Self-efficacy and quality of life affect each other positively. High self-efficacy and good quality of life is influential in the recovery of stroke patients. There is a need to incorporate the educational booklet into the stroke rehabilitation program by the nurses. In the rehabilitation program, improvements should be achieved in the relevant domains of quality of life so that patients' self-efficacy may be improved.

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REFERENCES

1. Bandura, A. (1982). Self-efficacy mechanism in human agency. *American psychologist, 37*(2), 122.
2. Benjamin, E. J., Blaha, M. J., Chiuve, S. E., Cushman, M., Das, S. R., Deo, R., Gillespie, C. (2017). American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Heart disease and stroke statistics-2017 update: a report from the American Heart Association. Circulation, 135*(10), e146-e603.
3. Cacchione, P. (2007). Nursing care of older adults with age related vision loss. In H. SC (Ed.), *Vision Loss in Older Adults: Nursing Assessment and Care Management* (pp. 131-145). New York: Springer Publishing Company.
4. Denny, M. C., Vahidy, F., Vu, K. Y., Sharrief, A. Z., & Savitz, S. I. (2017). Video-based educational intervention associated with improved stroke literacy, self-efficacy, and patient satisfaction. *PloS one, 12*(3), e0171952.
5. Glize, B., Villain, M., Richert, L., Vellay, M., Mazaux, J., Dehail, P., Joseph, P. (2017). Language features in the acute phase of poststroke severe aphasia could predict the outcome. *European journal of physical and rehabilitation medicine, 53*(2), 249-255.
6. Hafsteinsdóttir, T. B., Vergunst, M., Lindeman, E., & Schuurmans, M. (2011). Educational needs of patients with a stroke and their caregivers: a systematic review of the literature. *Patient education and counseling, 85*(1), 14-25.
7. Hakverdioğlu Yönt, G., & Khorshid, L. (2012). Turkish version of the stroke-specific quality of life scale. International nursing review, 59(2), 274-280.
8. Harvey, R. L., Macko, R. F., Stein, J., Winstein, C. J., & Zorowitz, R. D. (2008). *Stroke recovery and rehabilitation*: Demos Medical Publishing.
9. Jones, F., Partridge, C., & Reid, F. (2008). The Stroke Self-Efficacy Questionnaire: measuring individual confidence in functional performance after stroke. *Journal of clinical nursing, 17*(7b), 244-252.
10. Jones, F., & Riazi, A. (2011). Self-efficacy and self-management after stroke: a systematic review. *Disability and rehabilitation, 33*(10), 797-810.
11. Kang, J. (2006). Effects of constraint-induced movement using self-efficacy enhancing strategies on the upper extremity function of chronic hemiplegic patients. *Journal of Korean Academy of Nursing, 36*(2), 403-414.
12. Kapucu, S., Türkan, S., & Fesci, H. (2009). Yatağa bağımlı inmeli hastalara bakım veren hasta yakınlarının yaşadıkları güçlükler. *Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi, 16*(3), 017-031.
13. Kendall, E., Catalano, T., Kuipers, P., Posner, N., Buys, N., & Charker, J. (2007). Recovery following stroke: the role of self-management education. *Social Science & Medicine, 64*(3), 735-746.
14. Kirkevold, M. (2010). The role of nursing in the rehabilitation of stroke survivors: an extended theoretical account. *Advances in Nursing Science, 33*(1), E27-E40.
15. Korpershoek, C., van der Bijl, J., & Hafsteinsdóttir, T. B. (2011). Self-efficacy and its influence on recovery of patients with stroke: a systematic review. *Journal of Advanced Nursing, 67*(9), 1876-1894.
16. Langhorne, P., Bernhardt, J., & Kwakkel, G. (2011). Stroke rehabilitation. *The Lancet, 377*(9778), 1693-1702. https://doi.org/10.1016/S0140-6736.
17. Lev, E. L., Daley, K. M., Conner, N. E., Reith, M., Fernandez, C., & Owen, S. V. (2001). An intervention to increase quality of life and self-care self-efficacy and decrease symptoms in breast cancer patients. *Research and Theory for Nursing Practice, 15*(3), 277-294.

18. Lii, Y. C., Tsay, S. L., & Wang, T. J. (2007). Group intervention to improve quality of life in haemodialysis patients. *Journal of clinical nursing, 16*(11c), 268-275.
19. Lindsay, M.P., et al. (2019), World stroke organization (WSO): global stroke fact sheet 2019. SAGE Publications Sage UK: London, England.
20. Mauk, K. L. (2012). *Rehabilitation nursing: A contemporary approach to practice*: Jones & Bartlett Learning.
21. Mozaffarian, D., Benjamin, E. J., Go, A. S., Arnett, D. K., Blaha, M. J., Cushman, M., . . . Fullerton, H. J. (2015). Heart disease and stroke statistics—2016 update: a report from the American Heart Association. *Circulation*, CIR. 0000000000000350.
22. Nir, Z., Zolotogorsky, Z., & Sugarman, H. (2004). Structured nursing intervention versus routine rehabilitation after stroke. *American journal of physical medicine & rehabilitation, 83*(7), 522-529.
23. Orem, D. E., Taylor, S. G., & Renpenning, K. M. (1995). Nursing: Concepts of practice.
24. Robinson-Smith, G., Johnston, M. V., & Allen, J. (2000). Self-care self-efficacy, quality of life, and depression after stroke. *Archives of physical medicine and rehabilitation, 81*(4), 460-464.
25. Robinson-Smith, G., & Pizzi, E. R. (2003). Maximizing stroke recovery using patient self-care self-efficacy. *Rehabilitation Nursing, 28*(2), 48-51.
26. Roy, C., & Andrews, H. A. (1999). *The Roy adaptation model* (Vol. 2): Appleton & Lange Stamford, CT.
27. Topçu, S., & Oğuz, S. (2017). Self-efficacy and quality of life after stroke İnme sonrası öz etkililik ve yaşam kalitesi. *Journal of Human Sciences, 14*(2), 1388-1396.
28. Topçu, S., & Oğuz, S. (2018). Translation and validation study for the stroke self-efficacy questionnaire in stroke survivors. International journal of nursing practice, e12646.
29. Wang, L., Chen, C. M., Liao, W. C., & Hsiao, C. Y. (2013). Evaluating a community-based stroke nursing education and rehabilitation programme for patients with mild stroke. *International journal of nursing practice, 19*(3), 249-256.
30. Westergren, A., Hallberg, I. R., & Ohlsson, O. (1999). Nursing assessment of dysphagia among patients with stroke. *Scandinavian journal of caring sciences, 13*(4), 274-282.
31. Williams, L. S., Weinberger, M., Harris, L. E., Clark, D. O., & Biller, J. (1999). Development of a stroke-specific quality of life scale. *Stroke, 30*(7), 1362-1369.