



The Effect of Training Based on the Self-Efficacy Model on the Quality of Life of Patients with Stroke

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Abstract

Background: Stroke is one of the major causes of inability in adults and the elderly. The chronic complications and the problems resulting from this disease have significant effects on the quality of life of these patients and result in diminished self-efficacy of the affected individuals. The present research was conducted with the aim of determining the effect of self-efficacy training on the quality of life and self-efficacy of patients with stroke.

Methods: This is a quasi-experimental study with a control group. The study population included ischemic stroke patients among which, a sample of 80 people were chosen according to the inclusion criteria through a convenience sampling method. They were then assigned randomly into intervention and control groups (40 subjects each). For the intervention group, a training program based on the self-efficacy model was presented in five sessions, but in the control group, only routine hospital cares were provided. In order to collect data, the stroke-specific quality of life scale, whose validity and reliability were measured and confirmed, was used. The data were analyzed by SPSS 16 at descriptive and analytical statistical levels (independent *t* test, paired *t* test, and analysis of variance).

Results: The findings indicated that there was no significant difference in the quality of life between the two groups before the training ($P > 0.005$). However, following the training, a significant difference was observed in the quality of life of patients with stroke between the intervention and control groups ($P < 0.005$). The results of this research indicated that the quality of life and its components in stroke patients had a greater mean value following training in the intervention group than in the control group.

Conclusions: Implementing self-efficacy training programs can result in the enhanced quality of life and self-efficacy among patients with stroke. Since the promotion of self-efficacy in patients with chronic disease is important, it is suggested that educational programs are also held for other patients with chronic diseases.

Keywords: Patients, Stroke, Quality of Life, Self-Efficacy

1. Background

Controlling and preventing chronic diseases are one of the major health problems in most countries of the world. With the gradual progression of chronic diseases, their adverse effects increase on the daily lives of patients. In the past, the effects of chronic diseases on the patient, family, and society were neglected, but today, they attract a great deal of attention (1). One of the most common chronic diseases is the stroke. This complication is a neurological disorder caused by weakened blood circulation to the brain, causing the death of brain cells in response to not receiving oxygen (2). Stroke is one of the main causes of mortality and neurological long-term disability worldwide. In 2013, over 4.6 million patients died of the stroke in devel-

oped countries. It is predicted that the number of mortality will grow by 20.5 percent by 2030 (3). In Iran, there are sporadic statistics about the prevalence of stroke. Nevertheless, based on some sparse studies, its prevalence has been reported to be 43 per every 100000 individuals out of which, 82 percent are of the ischemic type and 15 percent are the hemorrhagic stroke (4). Stroke results in different complications in patients given the type of the involved site of vessel and size, as well as the density of the brain damage (5). It includes movement disorders in half of the body, loss of cognitive abilities, cognitive problems, diminished memory and intellectual power, dependence on others for daily activities, impaired self-care, problems in learning of subtle movements, changes in the mood and

emotions, and eventually the lack of the participation of the patient in social and individual activities. These effects on the role of the individual can affect his duties, eventually leading to the diminished quality of life in them (3).

According to the WHO's definition (1999), quality of life refers to the persons' perception of their life situation which is affected by the cultural and value system of the situation they live in. Accordingly, the goals, expectations, standards, and desires of people are largely affected by their physical and psychological status, as the same as the level of independence along with social relations and beliefs (6). In recent years, measuring the quality of life and improving have turned into one of the primary objectives of healthcare systems. The aim of treating chronic patients is to enhance their quality of life by mitigating the effects of the disease. The studies conducted on stroke patients suggest that this group of patients does not have a desirable quality of life such that even in patients with mild stroke intensity, the level of quality of life is still low (7). Some studies also show that the reduced quality of life following stroke is not merely related to the physical disabilities due to the disease; rather, psychological factors are also involved, with self-efficacy being one of them (8). Self-efficacy was first propounded by a psychologist called Albert Bandura, which is considered a socio-cognitive theory. The self-efficacy theory states that generally if people believe that they can undertake a task, they act accordingly; but, if they believe they will fail, they avoid it. Those with high self-efficacy enjoy greater stability and self-confidence compared to individuals with low self-efficacy when facing challenging conditions (9). As the abilities of the patients in self-care diminish, so does their sense of self-efficacy. Due to problems in self-efficacy when facing a developed incident, instead of dealing with it logically, the patients avoid or deny the conditions and have illogical expectations about improvement (10). Self-efficacy is a psychological construct that has found a great importance in the management of chronic diseases. When stroke survivors return from hospital to the society, they face new realities including adaptation to physical and cognitive disorders, dependence on others, loss of identity, social isolation, diminished self-esteem, and psychological problems. These problems may have devastating consequences for the persons and impair their self-belief in qualification and efficacy in their daily life. Therefore, their belief in their abilities to overcome the problems they face is compromised (11). The healthcare team should be able to develop a sense of competence in the person to achieve self-efficacy so that the patient would be prepared to initiate rehabilitation interventions (12). Nurses, as one of the important members of the rehabilitation team, can play a significant role in improving patients following stroke. In ad-

dition to a focus on the physical problems of the disease, they should also pay attention to the psychological and social problems of the patients (13). Johansson et al. believe that today, the ultimate goal of healthcare in chronic diseases is not merely lengthening the longevity; rather, mitigation of symptoms, enhancement of performance, and improvement of patients' quality of life are also the important goals (14). Further, studies have shown that self-efficacy is associated with a higher quality of life and reduction of disease symptoms in cancer patients, chronic kidney disease patients, and cardiovascular patients, and is the most important variable in association with coronary artery bypass surgery. Therefore, based on these studies, it may also affect the quality of life and symptoms of stroke patients; yet, there is not sufficient evidence to support it (15).

Although various studies have been performed on the relationship between self-efficacy and quality of life in chronic diseases, there is not enough evidence about the effectiveness of self-efficacy interventions in the quality of life of stroke patients. Since no study has so far been conducted in this regard in Iran, the present study deals with determining the effect of self-efficacy training by performing its constructs (successful experience, vicarious experience, verbal encouragement, and perceived physical and emotional states) on the quality of life of stroke patients.

2. Methods

The present research is a quasi-experimental study with a control group conducted in 2018. The population of the study consisted of all patients with stroke hospitalized at Rafideh Rehabilitation Hospital, Tehran. The inclusion criteria were: Confirmed stroke diagnosis by a neurologist registered in the medical file of the patient, suffering from stroke for more than four months and less than two years, stroke severity of mild or moderate, an age of 55 - 70 years, a score of above 7 on cognitive status, no history of previous stroke, and no previous training on self-efficacy. In addition, they would have been able to participate in training sessions and to communicate verbally. The exclusion criteria included not being consent to participate in the study and inability to respond to the questions due to the disease. For determining the sample size, we had no similar background in the area of self-efficacy in patients with stroke. Thus, during a preliminary (pilot) study on 20 eligible individuals, the mean and standard deviation of all dimensions of the dependent variables of self-efficacy and quality of life in the research were obtained. Then, considering the confidence interval of 95 percent, the test power of 80 percent, and an attrition probability of 10 percent,

a sample size of 40 individuals was considered for each group.

Accordingly, using the convenience sampling method, 80 patients who met the inclusion criteria were chosen and randomly assigned to intervention and control groups through randomized transformed blocks.

In this research, the standard questionnaire of quality of life specific for stroke patients was used for data collection. A demographic information questionnaire including six personal questions (age, gender, education level, marital status, employment status, and living with family status) and two questions related to the disease (duration of suffering from stroke and the status of performance before the stroke) was completed by the researcher through interviewing the patients and investigating their medical files.

The stroke-specific quality of life scale, developed by Williams et al. (16), has 49 items and 12 subscales (energy = three items, family performance = three items, language = five items, physical activity = six items, mood = five items, personality = three items, self-care = five items, social functions = five items, mental status = three items, function of the upper limbs = five items, vision = three items, and work and generativity = three items). The questionnaire items in the subscales of energy, familial role, mood, personality, and social role are scored on a five-point Likert scale (completely disagree = 1 to completely agree = 5). On the other hand, the subscales of physical activity, thoughts, the function of the upper limbs, vision, generativity, and language scored between 5 = I had no problem and 1 = I was not absolutely able to do. Eventually, the subscale of self-care ranged in score between 5 = I was independent and 1 = I was absolutely dependent. The maximum and minimum scores obtained from the questionnaire are 245 and 49, respectively, with higher scores representing a higher quality of life. The reliability and validity of the translated questionnaire were determined by Mahmoodi et al. (17), where the Cronbach alpha coefficient and reliability were obtained as 0.96 and 100 percent, respectively.

After receiving an approval from the ethics committee of the University, the researcher referred to the rehabilitation wards of Rafideh Hospital in Tehran and acquired the permission to talk to patients and their families following the explanation of the research objectives to the head of the center and presenting the permissions. Next, the study objectives were explained to the target population and after gaining their interest, informed consent was taken. Initially, the individuals in both groups were requested to respond to the items of the questionnaires as a pretest. After running the pretest in both the intervention and control groups, the intervention group was divided into eight five-individual groups for holding the training sessions. The training program was implemented for the interven-

tion group during five 90-min sessions. Each group received the training based on the self-efficacy model one day per week. Since self-efficacy originates from four primary sources including progress and acquisition of successful experience, developing social models or vicarious experiences, verbal encouragement or assurance by others and physical symptoms restates, to enhance self-efficacy, the educational sessions were implemented as presented in [Table 1](#).

The patients were provided with the contact number of the researcher so that in the course of the two upcoming months when a session would be held for the posttest, they could contact him in case of any questions. At the end of the fifth session, an educational package related to the training sessions was given to each patient. Two months after holding the sessions, the patients in the intervention and control groups were asked to refer to the hospital on a specific date and re-complete the questionnaires as the posttest.

After data collection, SPSS 16 was used to analyze the data through descriptive and analytical statistics (independent *t* test, paired *t* test, and analysis of variance). In this research, all ethical issues were observed including receiving permission from the University and Ethics Committee of the University (IR.USWR.REC.1396.285), registration of the research in the Iranian Center for Clinical Trials (IRCT), introducing the researcher to the research units, explaining the stages of the procedure to the patients, receiving informed consent from the research units, ensuring confidentiality of the obtained information, ensuring the patients about their absolutely voluntary participation in the research and remaining in it, ensuring about complete understanding of all aspects of the research by the patients, explaining the possible complications resulting from participation in the research, and keeping all documents related to participation in the research completely confidential. In addition, the patient's right to quit the study was reserved. The researcher adhered to reserving the interests of the patient, their family, and their general benefits. Further, the educational package of the content of the training sessions was given to the control group at the end of the research.

3. Results

The demographic information of the participants in both groups is shown in [Table 2](#). In the intervention and control groups, the mean age was 62.5 and 64.1 years, respectively. Based on the results of the Mann-Whitney test, no significant difference was observed between the mean age of the two groups ($P = 0.238$). Therefore, the intervention and control groups were matched for age. No signif-

Table 1. The Educational Sessions Based on the Self-Efficacy Model (18-20)

Sessions	Educational Topics
First	Introduction of the group; describing objectives; a brief explanation of the process of the disease, complications, and therapeutic methods; physical problems of the disease. Then, the necessary training was given through the constructs of self-efficacy model.
Second	Reviewing the previous session, investigating the results of all the homework of the previous session, listening to the experiences of patients about the training given, and presenting techniques of reducing tension and relaxation.
Third	The social problems of patients were discussed.
Fourth	This session was held in the presence of one of the family members of stroke patients and the family members were encouraged to take some measures to encourage patients and give spirit to them.
Fifth	Reviewing and final conclusion of the problems and solutions presented in previous sessions. The patients were asked to practice these exercises and the suitable presented solutions for two months.

icant difference was observed in terms of the mean duration of the disease ($P = 0.393$). Thus, the mean duration of suffering from stroke was the same for both groups.

According to [Table 2](#), the Chi square test indicated that there was no significant difference in gender between the groups ($P = 0.653$). Therefore, the two groups matched each other in terms of gender. The Chi square test showed that the patients were at a low level of education, but matched each other in this category ($P = 0.835$). Fischer test did not show any significant difference between the two groups ($P = 0.645$). Therefore, the two groups matched each other in terms of marital status. The frequency distribution of living with the family was the same in the two groups and there was no significant difference between the two groups ($P = 0.500$). Further, based on the Fisher test, the frequency distribution of occupation in the two groups was the same and there was no significant difference in terms of occupation in the two groups ($P = 0.215$). The Chi square test results showed that the status of the patients before the stroke was the same in the two groups, and there was no significant difference in terms of the status of patients before stroke in the two groups ($P = 0.723$).

Before performing statistical tests and investigating the main hypotheses of the research, the normality of the distribution of the dependent variables of the research considering the two groups was examined by the Kolmogorov-Smirnov test. The results regarding the dimensions of quality of life showed that before the training in the intervention group, all dimensions except for upper limbs, vision, and language had a normal distribution, but in the control group, the dimensions of social role, activity of upper limbs, vision, and generativity did not have a normal distribution. Therefore, in analyzing variables with normal distribution, parametric tests were used, while for those with abnormal distribution, non-parametric tests were employed.

Further, the results on the dimensions of quality of life showed that after the training, in the intervention group, all the dimensions except for vision and language had a

normal distribution, but in the control group, all the dimensions except for vision and generativity had a normal distribution.

[Table 3](#) compares the quality of life in patients with stroke in the intervention and control groups before and after the training, using a paired *t* test for normal variables and Wilcoxon test (*) for abnormal variables at a significance level of $P < 0.05$.

The results of paired *t* test showed that the mean scores of all dimensions and the total mean score of quality of life in the intervention group were significantly different before and after the intervention ($P = 0.001$). Similarly, in the control group, the mean scores of the dimensions including energy with $P = 0.005$, behavior with $P = 0.04$, personality with $P = 0.03$, movement with $P = 0.01$, and self-care with $P = 0.001$, and the total mean score of quality of life with $P = 0.002$ were significantly different before and after the intervention.

In the intervention group, before and after the training, according to Wilcoxon results, the mean score of the dimensions including social role with $P = 0.001$, upper limb activity with $P = 0.001$, vision with $P = 0.01$, work and generativity with $P = 0.001$, and language with $P = 0.03$ in the intervention group before and after the training showed a significant difference. In other words, the intervention was able to create a significant difference in the mean quality of life of the research units. In the intervention group, the total mean score of quality of life increased from 135.8 to 173.77, showing an ascending trend compared to the previous state. Among the dimensions of quality of life, movement, self-care, and upper limb activity indicated the maximum variations, in sequence, while thinking, language, and vision showed the minimum variation compared to the pre-intervention period.

In the control group, according to the Wilcoxon test, the mean score of language with $P = 0.01$ before and after the intervention had a significant difference. Moreover, the total mean score of quality of life changed from 128.1 to 132.77, but in spite of the significance of this difference,

Table 2. The Demographic Characteristics and Comparing the Two Groups

Variable	Intervention Group, No. (%)	Control Group, No. (%)	Significance Level
Gender			0.653
Male	21 (52.5)	23 (57.5)	
Female	19 (47.5)	17 (42.5)	
Level of education			0.835
Illiterate	8 (20)	6 (15)	
Sub-diploma	18 (45)	16 (40)	
Diploma and above	14 (35)	18 (45)	
Marital status			0.645
Single	2 (5)	1 (2.5)	
Married	24 (60)	23 (57.5)	
Divorced	1 (2.5)	0 (0)	
Deceased spouse	13 (32.5)	16 (40)	
Living with family			0.5
Yes	36 (90)	35 (87.5)	
No	4 (10)	5 (12.5)	
Status before stroke			0.723
Independent	36 (90)	35 (87.5)	
Dependent	4 (10)	5 (12.5)	

it was far lower than the corresponding score in the intervention group. Among the dimensions of quality of life, energy, behavior, personality, movement, language, and self-care, in sequence, showed significant variations compared to pre-intervention.

According to the results of Table 4, the mean score of all dimensions except for the dimensions of behavior, personality, and thinking, based on independent *t* test had a significant difference after the intervention between the intervention and control groups. Furthermore, since the dimension of social role and upper limb activity, as well as work and generativity and language, had abnormal distributions, the Mann-Whitney test was used to compare the scores of these dimensions in these two groups. The results showed that the mean scores of the dimensions of social role, upper limb activity, work and generativity with $P = 0.001$ and language with $P = 0.01$ were significantly different between the two groups. In other words, the intervention was able to create a significant difference in the mean score of quality of life of the research units in the intervention group.

Since one of the presumptions of performing covariance analysis test is the significance of the relationship between pretest and posttest scores, in Table 5, covariance analysis is shown to compare the mean scores of quality of life by modifying the effect of quality of life scores at

pretest in the intervention and control groups.

As shown in Table 5, the mean score of quality of life in the intervention and control groups had a significant difference ($P < 0.05$). Based on the results of covariance analysis, it is observed that the probability value for constant effect in both groups is lower than the critical value of 0.05, which is significant. Further, since the probability value of the greatest effect is significant, it is deduced that the effect of pretest in performing the intervention has been controlled, and the extent of the effect of pretest has been controlled in the posttest. In addition, given the significance of the group effect, a significant difference was observed between the two groups in terms of the mean score of quality of life.

4. Discussion

Considering the demographic information of patients, as the results indicated, the intervention and control groups of stroke patients participating in this research matched each other in terms of the underlying variables including age, gender, education level, marital status, employment status, living with family members, duration of the disease, and status of functioning before the stroke. Overall, it can be concluded that the intervention and control groups were homogeneous. In other words, they were

Table 3. Comparing the Level of Quality of Life in Patients with Stroke in the Intervention and Control Groups Before and After the Training

Quality of Life Dimensions	Before the Intervention		After the Intervention		Statistic Value	P Value
	Mean	SD	Mean	SD		
Energy						
Intervention	5.82	2.5	9.82	2.63	8.191	0.001 ^a
Control	5.3	1.96	6	2.21	2.97	0.005 ^a
Familial role						
Intervention	7.87	2.47	10.35	2.34	6.621	0.001 ^a
Control	8.07	2.86	7.9	2.67	-0.77	0.044
Behavior						
Intervention	14.77	5.16	17.7	4.47	5.291	0.001 ^a
Control	15.3	4.98	15.85	4.34	2.09	0.04 ^a
Personality						
Intervention	6.47	3.42	8.6	3.09	5.9	0.001 ^a
Control	7.07	2.81	7.5	2.9	2.13	0.03 ^a
Social role						
Intervention	9.37		13.37	-	4.5 ^a	0.001 ^b
Control	8.6	-	8.42	-	0.7 ^a	0.47
Movement						
Intervention	15.37	4.52	21.05	4.07	9.02	0.001 ^a
Control	12.35	4.23	14.4	5.07	2.45	0.01 ^a
Thinking						
Intervention	11.37	2.87	11.95	2.43	2.481	0.01 ^a
Control	11.57	2.48	11.55	2.28	-0.16	0.87
Activity of upper limbs						
Intervention	10.42		16.87		5.49 ^a	0.001 ^b
Control	9.4		9.67		1.45 ^a	0.14
Vision						
Intervention	12.97		13.32		2.35 ^a	0.01 ^a
Control	12.52		12.62		1.1 ^a	0.24
Work and generativity						
Intervention	6.22		9.62		5.2 ^a	0.001 ^b
Control	6		6.02		0.19 ^a	0.84
Language						
Intervention	22.42		23.05		2.19 ^a	0.02 ^b
Control	20.85		21.45		2.4 ^a	0.01 ^b
Self-care						
Intervention	12.7	4.74	18.05	4.36	9.84	0.001 ^a
Control	10.05	3.54	11.37	3.88	4.07	0.001 ^a
Quality of life						
Intervention	135.82	22.76	173.77	27.45	13.19	0.001 ^a
Control	128.1	24.01	132.77	25.73	3.37	0.002 ^a

^a Mann-Whitney test for variables with abnormal distribution at a significance level of 0.05.^b Independent *t* test for variables with normal distribution.

Table 4. Comparing the Dimensions of Quality of Life in the Intervention and Control Groups Following the Training

Dimensions of Quality of Life	Intervention Group		Control Group		P Value		
	Mean	Standard Deviation	Mean	Standard Deviation			
Energy	9.82	2.63	6	2.21	0.001		
Familial role	10.35	2.34	7.9	2.67	0.001		
Behavior	17.7	4.47	15.85	4.34	0.06		
Personality	8.6	3.09	7.5	2.9	0.1		
Social role	Average rank: 54.45		Average rank: 26.55		0.001; 242 ^a		
Movement	21.5	4.07	14.4	5.07	0.001 ^a		
Thinking	11.95	2.43	11.55	2.28	0.45		
Upper limb activity	Average rank: 54.96		Average rank: 26.04		0.001 ^b ; 221 ^a		
Vision	13.32	42.5	2.11	12.62	38.5	2.81	0.41; 720 ^a
Work and generativity	9.62	54.08	2.56	6.02	26.93	2.29	0.001 ^b ; 257 ^a
Language	23.05	46.63	2.76	21.45	34.38	3.1	0.01 ^b ; 555 ^a
Self-care	18.05	4.36	11.37	3.88			0.001 ^a
Quality of life	173.77	27.45	132.77	25.73			0.001 ^a

^a Mann-Whitney test for variables with abnormal distribution at a significance level of 0.05.

^b Independent *t* test for variables with normal distribution.

Table 5. Covariance Analysis to Compare the Mean Score of Quality of Life by Modifying the Effect of Quality of Life Scores at Pretest in the Intervention and Control Groups

Source of Changes	Variable	Sum of Squares	Degree of Freedom	Sum of Squares	F-Statistic	Probability Value
Intercept	Quality-of-life	73439.03	3	24479.67	120.81	0.000
Group	Quality-of-life	21725.45	1	1168.3	107.22	0.000
Error	Quality-of-life	15398.91	76	202.61		
Sum	Quality-of-life	1968296	80			

homogeneous statistically in terms of underlying and confounding variables which could have affected the results of the research, and any changes developed might have been due to the intervention.

Furthermore, most participants in this research in both groups were married men with the mean age of 62 - 64 years with a primary level of education. In this regard, in the research by Khorrami Markany et al. most stroke patients participating in the research were married men with a low level of literacy (21). In the study by Dehghan Nayeri et al. most participants had primary levels of education (22). Further, in the research by Sahebalmamani et al. the participants had a mean age of 62 years and low levels of education (23). Furthermore, most subjects in the research by Azimi et al. had primary levels of education (24).

Before investigating the research objectives, the normal distribution of the 12 dimensions of the quality of life scale before the intervention in both control and intervention groups was examined by the Kolmogorov-Smirnov test. Thus, in analyzing variables with normal distribution,

parametric tests were used and for other variables, non-parametric tests were employed.

The results of the study in the intervention group before the education showed that the total mean score of quality of life of stroke patients after the intervention had an ascending trend which was statistically significant. In investigating the 12 dimensions of quality of life, the results showed that the mean scores of all dimensions and the total mean score of quality of life in the intervention group before and after the intervention had a significant difference with $P < 0.05$. Generally, it can be stated that the quality of life of stroke patients in the intervention group following the intervention had maximum improvement in the areas of movement, upper limb functioning, self-care, social role, energy, work and generativity, behavior, familial role, and personality, in sequence, while the areas of language, vision, and thinking experienced the least improvement.

In the control group, the results showed that before and after the intervention, the total mean score of qual-

ity of life statistically significantly changed. In investigating the 12 dimensions of quality of life, the results showed that the mean scores of the dimensions including energy, behavior, personality, movement, language, and self-care were significantly different in the control group before and after the routine training. Since the control group received routine hospital care during the research, these minor changes in some of the dimensions of quality of life were predictable though these changes were not been considerable compared to the statistical results of the intervention group.

Comparing the quality of life of stroke patients between the intervention and control groups in the pre- and post-intervention stages, the results showed that before the intervention, the intervention and control groups did not experience any significant change in the total mean score of quality of life. However, considering some dimensions of quality of life such as movement, self-care, and language, a significant difference was observed between the intervention and control groups. In the stage following the intervention, the comparison of the mean total score of quality of life between the control and intervention groups showed a significant change. Further, in investigating the 12 dimensions of quality of life, the mean score of all dimensions except for behavior, personality, thinking, and vision had a significant difference between the intervention and control groups in the post-intervention stage. The results suggest that the intervention group experienced a significant increase in the level of quality of life and its dimensions, and the quality of life following the training had a higher mean score in the intervention group than in the control group.

It seems that these results can be due to the effect of training based on self-efficacy in the intervention group. The findings indicated that implementing the self-efficacy program in patients with stroke was effective and yielded positive outcomes. This suggests that self-efficacy training can improve the quality of life of patients with stroke.

Various studies confirm the findings obtained in the present research. In the study by Momeni et al. which was performed with the aim of examining “the effect of self-care on the quality of life of patients with stroke”, in the intervention group, self-care training was implemented for five weeks, while the control group received no intervention but conventional physiotherapy. The results of this research showed that the quality of life after self-care training had a higher mean score in the intervention group than in the control group (25).

In the study by Azimi et al. entitled “the effect of home-based rehabilitation on the activities and quality of life of patients referring to Shariati Hospital in Isfahan and the pressure of their familial care providers”, it was observed

that quality of life was significantly different after the intervention compared to the pre-intervention. Further, in investigating the 12 dimensions of quality of life of patients with stroke, the areas of movement, upper limb function, self-care, and work/generativity had maximum improvements, in sequence, which is in line with the results of the present study (24).

The study by Eghlidi et al. with the aim of determining the effect of rehabilitation measures on the quality of life of patients with stroke showed that the total mean scores of quality of life and the score of its dimensions increased significantly in the areas of physical functioning, psychological functioning, social functioning, and general health after the rehabilitation measures compared to their previous state. These results were consistent with the results of this study. However, in measuring the quality of life dimensions between the two intervention groups and the control of the mean mental dimension, there was a significant increase in the physical dimensions (26).

The results of a study by Xu et al. entitled the effect of self-care education on the rehabilitation of patients with hemiplegic stroke confirmed the results of the present research. The results of this research showed that there is a significant difference before and after the intervention in terms of the mean scores acquired in different areas of functioning in the intervention group. Self-care training to hemiplegic stroke patients resulted in improved functioning in these patients and mitigated the probability of incidence of complications and re-hospitalization (27).

Further, a study by Noorian et al. with the aim of determining the effect of rehabilitation measures on the quality of life of patients with stroke showed that the total mean scores of quality of life and its dimensions increased significantly in the areas of physical functioning, psychological functioning, social functioning, and general health after the rehabilitation measures compared to their previous state (28).

The results of a study by Sahebalzamani et al. entitled the effect of self-care training on the rehabilitation of patients with hemiplegic stroke confirmed the results of the present research. The results of this research showed that there was a significant difference before and after the intervention in terms of the mean scores acquired in different areas of functioning in the intervention group. Self-care training to hemiplegic stroke patients resulted in improved functioning in these patients and mitigated the probability of incidence of complications and re-hospitalization (23).

4.1. Conclusion

The results obtained from this research showed that implementing self-efficacy-based training was able to en-

hance the level of quality of life in the research units. The results also suggested that training based on the self-efficacy model was effective in most areas thanks to having four constructs including successful experience, vicarious experience, verbal encouragement, and physiological and emotional states. Thus, it can be used as a solution for providing care to stroke patients, in particular. Since these interventions reduce the probability of incidence of complications and re-hospitalization, it will lead to the reduction of costs, as well. Since nurses play a major role in promoting the health of patients and the healthcare system, this type of interventions can highlight the role of nurses in second-level prevention and prevent from the development of disabilities and complications resulting from this disease. Therefore, nurses can help in this regard and play the responsibility to keep the psychological and physical health of patients by implementing measures such as educating patients, thereby playing a significant role in minimizing physical disabilities in stroke patients. Therefore, rehabilitation interventions alongside self-efficacy training will result in the enhanced quality of life of patients. Nevertheless, considering all confounding factors, which may have been overlooked by the researcher, and in despite of the all-around attempt for controlling the conditions to reduce the effect of confounding factors and all limitations of the research (the limitations in educational and rehabilitation sessions of the sample when entering this study) that should be considered, this study can be a basis for future studies and a beginning for implementing psychological models, especially with regard to stroke.

References

1. Ashktorab T, Yadollahi S, Zayery F. [The correlation between self-management behaviors and drug adherence among people with epilepsy in Iran Epilepsy Association]. *Sci J Hamadan Nurs Midwifery Facult.* 2013;**21**(2):5-15. Persian.
2. Esfandiari E, Arazpour M, Saeedi H, Ahmadi A. [Literature review of the effect of ankle-foot orthosis on gait parameters after stroke]. *Arch Rehabil.* 2017;**18**(2):164-79. Persian. doi: [10.21859/jrehab-1802160](https://doi.org/10.21859/jrehab-1802160).
3. Topcu S, Oguz S. Translation and validation study for the Stroke Self-Efficacy Questionnaire in stroke survivors. *Int J Nurs Pract.* 2018;**24**(4). e12646. doi: [10.1111/ijn.12646](https://doi.org/10.1111/ijn.12646). [PubMed: [29575417](https://pubmed.ncbi.nlm.nih.gov/29575417/)].
4. Daneshfard B, Izadi S, Shariat A, Toudaji MA, Beyzavi Z, Niknam L. Epidemiology of stroke in Shiraz, Iran. *Iran J Neurol.* 2015;**14**(3):158-63. [PubMed: [26622981](https://pubmed.ncbi.nlm.nih.gov/26622981/)]. [PubMed Central: [PMC4662689](https://pubmed.ncbi.nlm.nih.gov/PMC4662689/)].
5. Mazaheri T, Fallahpoor M, Karimlou M, Hosseini A. [Validity of Persian version of Stroke Impact Scale (SIS) in patients with stroke]. *J Res Rehabil Sci.* 2011;**7**(5 (SUPPLEMENT)):688-97. Persian.
6. Azizi M, Motamedzade M. [Study of nurses quality of life using WHO questionnaire in hospitals of Hamadan University of Medical Sciences]. *J Occup Hyg Eng.* 2015;**1**(4):68-75. Persian.
7. Wu X, Min L, Cong L, Jia Y, Liu C, Zhao H, et al. Sex differences in health-related quality of life among adult stroke patients in Northeastern China. *J Clin Neurosci.* 2014;**21**(6):957-61. doi: [10.1016/j.jocn.2013.08.030](https://doi.org/10.1016/j.jocn.2013.08.030). [PubMed: [2441132](https://pubmed.ncbi.nlm.nih.gov/2441132/)].
8. Langan J, Delave K, Phillips L, Pangilinan P, Brown SH. Home-based telerehabilitation shows improved upper limb function in adults with chronic stroke: A pilot study. *J Rehabil Med.* 2013;**45**(2):217-20. doi: [10.2340/16501977-1115](https://doi.org/10.2340/16501977-1115). [PubMed: [23319181](https://pubmed.ncbi.nlm.nih.gov/23319181/)]. [PubMed Central: [PMC4104503](https://pubmed.ncbi.nlm.nih.gov/PMC4104503/)].
9. Tougas ME, Hayden JA, McGrath PJ, Huguet A, Rozario S. A systematic review exploring the social cognitive theory of self-regulation as a framework for chronic health condition interventions. *PLoS One.* 2015;**10**(8). e0134977. doi: [10.1371/journal.pone.0134977](https://doi.org/10.1371/journal.pone.0134977).
10. Bazargani RH, Besharat MA, Ehsan HB, Nejatian M, Hosseini K. The efficacy of chronic disease self management programs and Tele-health on psychosocial adjustment by increasing self-efficacy in patients with CABG. *Procedia-Soc Behav Sci.* 2011;**30**:830-4. doi: [10.1016/j.sbspro.2011.10.161](https://doi.org/10.1016/j.sbspro.2011.10.161).
11. Maujean A, Davis P, Kendall E, Casey L, Loxton N. The Daily Living Self-Efficacy Scale: A new measure for assessing self-efficacy in stroke survivors. *Disabil Rehabil.* 2014;**36**(6):504-11. doi: [10.3109/09638288.2013.804592](https://doi.org/10.3109/09638288.2013.804592). [PubMed: [23781908](https://pubmed.ncbi.nlm.nih.gov/23781908/)].
12. Selzler AM, Rodgers WM, Berry TR, Stickland MK. The importance of exercise self-efficacy for clinical outcomes in pulmonary rehabilitation. *Rehabil Psychol.* 2016;**61**(4):380-8. doi: [10.1037/rep0000106](https://doi.org/10.1037/rep0000106). [PubMed: [27831730](https://pubmed.ncbi.nlm.nih.gov/27831730/)].
13. Korpershoek C, van der Bijl J, Hafsteinsdottir TB. Self-efficacy and its influence on recovery of patients with stroke: A systematic review. *J Adv Nurs.* 2011;**67**(9):1876-94. doi: [10.1111/j.1365-2648.2011.05659.x](https://doi.org/10.1111/j.1365-2648.2011.05659.x). [PubMed: [21645040](https://pubmed.ncbi.nlm.nih.gov/21645040/)].
14. Johansson P, Dahlstrom U, Brostrom A. Factors and interventions influencing health-related quality of life in patients with heart failure: A review of the literature. *Eur J Cardiovasc Nurs.* 2006;**5**(1):5-15. doi: [10.1016/j.ejcnurse.2005.04.011](https://doi.org/10.1016/j.ejcnurse.2005.04.011). [PubMed: [15967277](https://pubmed.ncbi.nlm.nih.gov/15967277/)].
15. Mansoreye N, Poursharifi H, Taban Sadegi MR, Seirafi MR. [The correlation between social support and self-care in patients with heart failure: The mediating role of illness perception]. *J Health Promot Manag.* 2017;**6**(5):43-50. Persian.
16. Williams LS, Weinberger M, Harris LE, Clark DO, Biller J. Development of a stroke-specific quality of life scale. *Stroke.* 1999;**30**(7):1362-9. doi: [10.1161/01.STR.30.7.1362](https://doi.org/10.1161/01.STR.30.7.1362). [PubMed: [10390308](https://pubmed.ncbi.nlm.nih.gov/10390308/)].
17. Mahmoodi M, Safari A, Vossoughi M, Golbon-Haghighi F, Kamali-Sarvestani M, Ghaem H, et al. Stroke Specific Quality of Life Questionnaire: Test of reliability and validity of the Persian version. *Iran J Neurol.* 2015;**14**(2):94-100. [PubMed: [26056554](https://pubmed.ncbi.nlm.nih.gov/26056554/)]. [PubMed Central: [PMC4449400](https://pubmed.ncbi.nlm.nih.gov/PMC4449400/)].
18. Hejazi S, Peyman N, Tajfard M, Esmaily H. [The impact of education based on self-efficacy theory on health literacy, self-efficacy and self-care behaviors in patients with type 2 diabetes]. *Iran J Health Educ Health Promot.* 2017;**5**(4):296-303. Persian. doi: [10.30699/acadpub-ijhehp.5.4.296](https://doi.org/10.30699/acadpub-ijhehp.5.4.296).
19. Baljani E, Rahimi JH, Amanpour E, Salimi S, Parkhashjoo M. [Effects of a nursing intervention on improving self-efficacy and reducing cardiovascular risk factors in patients with cardiovascular diseases]. *J Hayat.* 2011;**17**(1). Persian.
20. Jones F, Riazi A. Self-efficacy and self-management after stroke: A systematic review. *Disabil Rehabil.* 2011;**33**(10):797-810. doi: [10.3109/09638288.2010.511415](https://doi.org/10.3109/09638288.2010.511415). [PubMed: [20795919](https://pubmed.ncbi.nlm.nih.gov/20795919/)].
21. Khorrami Markany A, YarMohammadi A, Khalkhali HR, Azimzadeh R. [Assessing the effectiveness of home nursing care plan on activities of daily living of stroke patients in Urmia city, 2014]. *J Urmia Nurs Midwifery Facult.* 2016;**13**(12):1071-80. Persian.
22. Dehghan Nayeri N, Mohammadi S, Pedram Razi S, Kazemnejad A. [Adherence of family caregivers of patients with stroke to rehabilitation regimen]. *J Hayat.* 2012;**18**(1):30-41. Persian.
23. Sahebalzamani M, Alillo L, Shakibi A. [Efficacy of Self care education on rehabilitation of CVA patients]. *Med Sci J Islamic Azad Univ.* 2007;**17**(4):213-8. Persian.
24. Azimi R, Mohammadi F, Hosseini M, Farzi M. [The effect of home-based stroke rehabilitation on quality of life of stroke survivors and

- their family caregiver's strain]. *Evid Based Care*. 2013;**3**(1):77-85. Persian.
25. Momeni H, Salehi A, Seraji A, Foruoghi S. [Effect of Orem's self care theory on quality of life in patients with CVA]. *Yafte*. 2010;**11**(4):99-106. Persian.
 26. Eghlidi J, Shafiee Z, Vatandust M, Rezaee M, Jamebozorgi AA, Tabatabaee SM. [Effects of mental practices on balance and quality of life in stroke]. *J Rehab Med*. 2016;**4**(4):20-7. Persian.
 27. Xu S, Zhang Z, Wang A, Zhu J, Tang H, Zhu X. Effect of self-efficacy intervention on quality of life of patients with intestinal stoma. *Gastroenterol Nurs*. 2018;**41**(4):341-6. doi: [10.1097/SGA.0000000000000290](https://doi.org/10.1097/SGA.0000000000000290). [PubMed: [28727664](https://pubmed.ncbi.nlm.nih.gov/28727664/)]. [PubMed Central: [PMC6078485](https://pubmed.ncbi.nlm.nih.gov/PMC6078485/)].
 28. Noorian C, Kazemian A, Aslani Y, Delaram M. [The effect of rehabilitation on life quality of patients suffering from stroke]. *J Zanzan Univ Med Sci Health Serv*. 2005;**13**(50):22-7. Persian.