Original Article

The Effect of a Training Program Based on the Theory of Planned Behavior on the Self-Care of Patients with Cerebrovascular Accident: A Randomized Controlled Trial

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Abstract

Background: Cerebrovascular accident dramatically impacts patients' lives. However, this chronic disease could be managed by boosting self-care and following healthy behaviors. Accordingly, this trial sought to specify the impact of a training program established on the theory of planned behavior on the self-care of clients with this condition. **Materials and Methods:** This trial was performed on 80 clients, who were selected using a random numbers table and divided into two equal groups to receive either usual care alone or usual care plus a training program based on the theory of planned behavior (five in-hospital individual sessions for 5 weeks and weekly phone follow-ups for 2 months after discharge). Self-care and the dimensions of the theory of planned behavior were investigated at baseline and 2 months after the last in-hospital session using the standardized Shah version of the modified Barthel index and a researcher-made questionnaire, respectively. **Results:** The mean score of self-care was significantly higher in the experimental arm at the posttest (Mann–Whitney = 506.00, $p = 0.005$). Also, the increase in mean change of self-care from baseline to posttest was significantly more in the experimental arm ($t_{78} = -6.6$, $p < 0.001$). Such findings were also found for all dimensions of the theory of planned behavior. **Conclusions:** Based on results, nurses and health policymakers can incorporate training based on the theory of planned behavior into routine care programs for patients with cerebrovascular accident to boost their self-care. The implemented intervention also could be reproduced in other contexts. Hence, further trials are requested to specify the sustainability of the findings.

Keywords: *Education, patients, randomized controlled trial, self-care, stroke, theory of planned behavior*

Introduction

Cerebrovascular Accident (CVA), also called stroke, is a common neurovascular cause of disability, mainly in regions with low sociodemographic status.[1] The incident rate of this debilitating neurological disease is growing, especially in developing countries.[2] This problem is the second top cause of death worldwide, and its mortality has substantially increased globally during the past 30 years.[3] Besides, the global rate of deaths due to this disease is predicted to rise to 4.90 million by 2030.[4] Many advances have been made in managing the different phases of CVA in recent decades.[5] Studies have shown that adequate control of this disease's leading risk factors (e.g., hypertension, psychosocial stress, smoking, and inappropriate food habits) could substantially decrease the disease burden.[4,6] Thus, there is a great necessity to change unhealthy behaviors affecting CVA control by creating and strengthening awareness regarding this disease's potential risk factors.[7,8]

Although changing unhealthy behavior is challenging, health-related educational methods based on the appropriate and well-known behavioral models/theories can help healthy or ill individuals to change their beliefs about a disease or preventive measures.[9,10] In this regard, the Theory of Planned Behavior (TPB) is one of the best supported theoretical guidelines for anticipating human behavior, behavioral changes, or designing effective health interventions.[11] This social–psychological theory, introduced by Ajzen and Fishbein (1977),[12] emphasizes that

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behavioral intentions are the primary determinant of behavior, which could be affected by three independent constructs: perceived behavioral control (i.e., an individual's perception concerning their capability to conduct a behavior), attitudes regarding the behavior, and subjective norms (i.e., social tension on individuals to accomplish or not to accomplish a specific behavior).[13] According to TPB, individuals systematically utilize available information and evaluate their actions' consequences before being involved in a behavior. Indeed, with a full intent to perform a behavior, an individual leans to carry out that behavior.[14]

Among different behaviors, self-care is most important to prevent complications and maintain the health of individuals suffering from chronic diseases. During these behaviors, individuals utilize their knowledge, abilities, and skills to sustain their health independently.[15] Up to now, different Randomized Controlled Trials (RCTs) have been performed in Iran to evaluate the applicability of TPB-based training interventions for boosting the self-care behaviors of clients with various chronic conditions such as diabetes,[16,17] knee osteoarthritis,[18] cardiovascular diseases,[19] and hypertension.[20] Although previous studies were performed with appropriate design, to the best of our knowledge, no trial has yet addressed the self-care behavior of Iranian patients with CVA following the administration of a TPB-based program. However, studies conducted in other countries revealed a promising capacity for TPB to be incorporated in the CVA context.[21-25] Hence, considering the sensitivity of education to cultural disparities, determining whether the positive outcomes of previous trials may be similar in the cultural context of Iran is of merit. Due to these reasons and considering the vital role of following healthy behaviors and self-care in rehabilitating patients who experienced CVA, this study sought to investigate the effect of a training program based on TPB regarding the self-care behavior of these patients in an Iranian context.

Materials and Methods

This randomized, controlled, before-and-after trial was conducted on clients with CVA referred to three teaching hospitals (i.e., Shafa, Bahonar, and Afzalipour) affiliated with the Kerman University of Medical Sciences (KMU), Kerman, Iran, from November 2020 to November 2021. According to KMU regulations on health research, no trial registry was needed for the type of our study, considering the educational nature of the intervention. Hence, this study was not registered in a trial registry platform. Clients were eligible if they had a confirmed first-episode CVA, were 55–75 years old, signed the informed consent form by themselves, could understand the contents of training methods, were able to complete the study self-reported questionnaires, and had a possibility of making follow-up phone calls. Patients were excluded if they had partaken in an identical self-care training program in the last 6 months, were absent in at least one of the training sessions, were unable to perform self-care for any reason except CVA, and had a history of mental disorders and taking antipsychotic drugs. Moreover, participants who could not continue the study and those who filled out the study questionnaires incompletely were removed. According to a sample size formula proposed for comparing two independent means, and assuming a test power of 80% ($\beta = 0.20$), confidence interval of 95% ($\alpha = 0.05$), allocation ratio of 1:1, and effect size of 0.70, the number of patients needed was computed to be 33 per group, using G*power software (version 3.1.9.4). Nonetheless, based on the suggestion of an assistant statistician and the fundamental concepts for sample size calculation in RCTs,[26] 20% sample attrition was considered to improve the validity of the findings. Hence, the sample size was expanded to 40 individuals in each study group. Sampling was conducted using a simple random method (i.e., random numbers table). Eligible participants were randomly allotted to the experimental arm ($n = 40$) or the control arm ($n = 40$) through a block randomization method with 20 generated quadruplet blocks and an allocation ratio of 1:1 to achieve a balance between the groups.[27] The assistant statistician conducted the randomization process, and all related information was maintained confidential until the trial's end.

The data collection measures comprised a demographic–clinical information form, the standardized Shah version of the modified Barthel index (MBI),[28] and a researcher-made questionnaire of TPB constructs, which the patients filled out using a hand-delivered paper approach. The first tool was completed before group allocation, while the second and the third were filled out twice (i.e., before the intervention and 2 months after the last training session). MBI was used to measure the patients' self-care. This questionnaire was developed by Shah *et al*. (1989) for CVA rehabilitation to determine a client's ability in different dimensions of day-to-day performance. It includes 11 items as follows: 1) "transfer from chair to bed and vice versa," 2) "mobility status," 3) "going up and down the stairs," 4) "using the toilet," 5) "stool control," 6) "urine control," 7) "food eating," 8) "wearing clothes," 9) "using a wheelchair," 10) "taking a bath," and 11) "personal hygiene." Each item is evaluated using a five-point Likert scale from complete independence to complete dependence. Still, each item's score ranges between 0 and 15, pivoting on the individual's conditions and the item character (i.e., the first two items: a maximum of 15 scores; items 3–8: a maximum of 10 scores; and the last three items: a maximum of 5 scores). The total score ranges from 0 to 105, and higher scores imply a better situation.[28] Tagharrobi *et al*. (2011) evaluated the psychometric properties of MBI in Iran and reported an acceptable validity (i.e., content, convergent, and construct) and reliability (i.e., internal consistency

with Cronbach's alpha = 0.96-0.99, inter-rater with kappa for each item >0.60, and intraclass correlation for all items = 0.99).[29] In the present study, we obtained a Cronbach's alpha coefficient of 0.82 for the 11 presented items. In addition to self-care behavior, we measured the TPB dimensions by the TPB constructs questionnaire consisting of 25 items. The research team members developed this questionnaire; its validity (i.e., content and face) and reliability were also evaluated. To this end, guidance proposed by Fishbein and Ajzen (2010)[30] for designing a TPB-based questionnaire was followed. First, based on an extensive literature review, the researchers prepared a preliminary questionnaire with 25 items and five dimensions: 1) "knowledge," 2) "attitude," 3) "perceived behavioral control," 4) "subjective norms," and 5) "behavioral intention." Each dimension consists of five items and scores separately. The knowledge dimension is scored in a binary format (yes: score 1, no: score 0), while others are scored on a five-point Likert scale (from completely agree: score 5 to completely disagree: score 1). Hence, the total score of the knowledge dimension ranges from 0 to 5 and the total score of other dimensions varies from 5 to 25. In all dimensions, higher scores signify a better condition. Following the development of the preliminary version of the TPB constructs questionnaire, based on the method presented by Lawashe (1975) for estimating the content validity,[31] 10 experts (i.e., five health education assistants, three nursing faculty members, one neurologist, and one statistician) were selected purposively. All experts were satisfied with the preliminary version regarding the qualitative content validity criteria (i.e., the number of items, the logical sequence of items, scoring, and objectivity); however, they recommended minor modifications, which were made. Moreover, based on the methods proposed by Lawashe (1975)[31] and Waltz and Bausell (1983),[32] a minimum Content Validity Index (CVI) and Content Validity Ratio (CVR) of 0.90 and 0.80 were obtained for the modified version, respectively, which imply the necessity and relevance of all items. The qualitative face validity of the final version of the developed questionnaire was also confirmed by 10 patients with characteristics similar to those of the study population. Finally, the questionnaire's internal consistency was found to be satisfactory on estimating Cronbach's alpha (α) and Kuder–Richardson 20 (KR-20) for data obtained from 50 patients, who were selected purposefully and not supposed to participate in the principal analysis ($\alpha = 0.70$, $\alpha = 0.71$, $\alpha = 0.74$, and $\alpha = 0.73$ for "attitude," "perceived behavioral control," "subjective norms," and "behavioral intention," respectively, and KR-20 = 0.79 for "knowledge").

The study was performed first for patients of the control group; then, it was conducted for patients of the experimental group to avoid transmitting information among the participants of the study groups. The two groups received similar usual care by the nursing staff based on the protocol of the recruitment hospitals (i.e., routine care, treatments, and consultation). Participants in the control group received the usual training from the nursing staff, but no training from the researchers. In contrast, those in the experimental group received training based on TPB by a master's degree nursing student (first researcher). Based on a previous related study conducted in Iran,[17] five in-person sessions were provided during five consecutive weeks (one session per week). The duration of each session varied from 30 to 60 min based on the patient's misconceptions and understanding (average time: 45 min). The program primarily contains the following parts: 1) enhancing perceived behavioral control, 2) increasing knowledge, 3) establishing a positive behavioral attitude, 4) boosting subjective norms, and 5) fostering intentions toward behavioral change. An outline of the training sessions is given in Table 1. The training content was adapted from TPB domains[13] and valid textbooks and articles[33-39] by the research team members and then validated by 10 experts who were involved in estimating the content validity of the TPB constructs questionnaire. All sessions were held in an educational class of the corresponding hospital face to face and individually. During all sessions and for all TPB

Table 1: An outline of the training sessions established based on the theory of planned behavior for patients with cerebrovascular accident

Sessions	Contents	Constructs
One	Greetings, explaining the study's objectives, evaluating the patient's needs, emphasizing the importance of self-care behaviors and the consequences of unhealthy care behaviors	Behavioral intention
Two	Increasing the patient's knowledge regarding symptoms, risk factors and complications of cerebrovascular accidents, explaining healthy and unhealthy self-care behaviors	Knowledge, behavioral intention
Three	Evaluating patient's attitudes about improving their self-care behaviors, creating a positive attitude, as well as correcting false beliefs concerning self-care behaviors	Attitude, behavioral intention
Four	Understanding the patient's perceived norms (i.e., the patient's current beliefs that are influenced by friends, family members, or relatives' ideas), strengthening the patient's capacity to perform healthy self-care behaviors (behavioral control)	Subjective norms, perceived behavioral control
Five	An overview of suggested self-care behaviors, obtaining the patient's opinions regarding the changes they have made in their self-care behaviors during the sessions, recognizing the patient's challenges and resolving them	All constructs

constructs, lecture and question-and-answer methods were used based on the situation. The lecture was presented with straightforward and understandable instructions, using training aids (e.g., Microsoft PowerPoint and whiteboard with marker). Also, a question-and-answer method was applied to encourage and challenge patients to correct their misconceptions and understand the concept by themselves. At the end of each training session, the patient was given a leaflet containing the contents trained in the session for more review.

Between each training session, the patients were followed up weekly via a 20-min phone call to provide further guidance and support and assure them against understatements of concerns or settle any issues. Also, at the end of the last training session until 2 months later, they were followed up weekly via a 20-min phone call to manage their needs and caregivers' demands. The time of each session was scheduled by the patient's desire. If the patients were discharged at the interval of the sessions, forthcoming training sessions were presented when they were referred to the recruitment hospitals for weekly routine visits.

All analyses were run with the Statistical Package for Social Sciences software (version 26.00; SPSS Inc., Chicago, IL, USA). The data analyzer was unaware of the codes assigned to the study groups, to reduce bias. Data normalcy was evaluated by the Shapiro–Wilk test. Descriptive statistics for categorical variables are shown as numbers (%), while quantitative variables are presented as mean (standard deviation [SD]) and median (first and third Interquartile Range [IQR]). Moreover, paired and independent samples *t*-tests or the Wilcoxon and Mann–Whitney U tests were applied to report the inferential data, depending on the normality of data distribution. The significance level was deemed less than 0.05.

Ethical considerations

Before data collection, a written informed consent form was signed by all included patients. Besides, they were allowed to refuse to participate in the study without any consequences. Likewise, to observe the ethical considerations, the control group participants were requested to partake in a 30–60 min training session at the end of the trial. Also, we did not pose any additional cost to patients; instead, they were given an incentive at the study's end. Ethical support was also received from the Research Ethics Committee of KMU (No. IR.KMU.REC.1399.478).

Results

All 80 recruited patients ended the trial and were incorporated into the final analysis [Figure 1]. Demographic–clinical variables of the patients are presented in Table 2. The results demonstrated no significant differences between the two study groups regarding these variables.

Before the intervention, no significant intergroup differences existed in the mean scores of MBI and all dimensions of the TPB constructs. Nevertheless, the posttest mean score of MBI in the experimental arm was much higher than in the control arm (Mann–Whitney = 506.00, $p = 0.005$). Also, the participants of the experimental arm had higher posttest scores than those of the control arm regarding all dimensions of the TPB constructs, including "knowledge" (Mann–Whitney = 325.50, $p < 0.001$), "attitude"

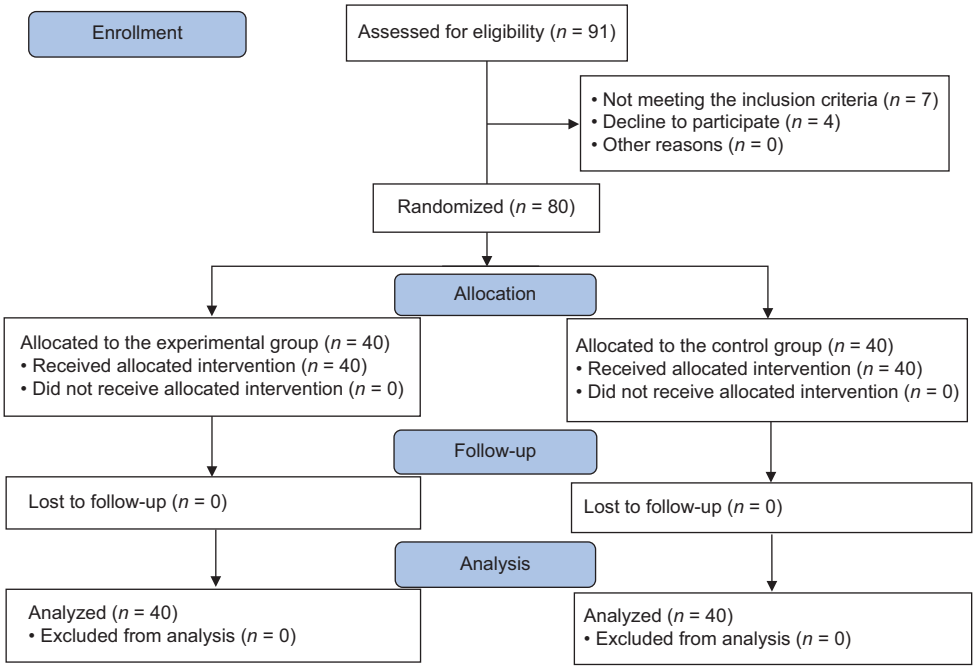

Figure 1: Consolidated standards of reporting trials

Table 2: Demographic–clinical characteristics of patients with cerebrovascular accident in the study groups

Variables		Control group (*n*=40) *n* (%)	Intervention group (*n*=40) *n* (%)	*p*[a]
Age (years)	55–60	13 (32.50)	13 (32.50)	0.091
	60–65	15 (37.50)	6 (15.00)	
	65-70	6 (15.00)	12 (30.00)	
	70–75	6 (15.00)	9 (22.50)	
Gender	Male	29 (72.50)	23 (57.50)	0.160
	Female	11 (27.50)	17 (42.50)	
Marital status	Single	1 (2.50)	0 (0.00)	0.311
	Married	33 (82.50)	37 (92.50)	
	Widow	6 (15.00)	3 (7.50)	
Educational level	Elementary	19 (47.50)	9 (22.50)	0.484
	High school	6 (15.00)	9 (22.50)	
	Diploma	6 (15.00)	9 (22.50)	
	Higher than diploma	9 (22.50)	5 (12.50)	
Occupation	Housewife	10 (25.00)	12 (30.00)	0.497
	Employed	5 (12.50)	6 (15.00)	
	Unemployed	0 (0.00)	2 (5.00)	
	Retired	25 (62.50)	20 (50.00)	
Number of children	Maximum one	6 (15.00)	3 (7.50)	0.59
	Two to three	12 (30.00)	15 (37.50)	
	More than three	22 (55.00)	22 (55.00)	
Family history of stroke	Yes	6 (15.00)	10 (25.00)	0.264
	No	34 (85.00)	30 (75.00)	
Smoking history	Yes	17 (42.50)	16 (40.00)	0.820
	No	23 (57.50)	24 (60.00)	
History of underlying disease	Yes	20 (50.00)	23 (57.50)	0.501
	No	20 (50.00)	17 (42.50)	

[a]Mann–Whitney *U* test

(Mann–Whitney = 96.00, $p < 0.001$), "perceived behavioral control" (Mann–Whitney = 296.50, $p < 0.001$), "subjective norms" (t_{78}= –4.22, $p < 0.001$), and "behavioral intention" (Mann–Whitney = 334.50, $p < 0.001$). Besides, the mean score of MBI increased considerably at the end of the intervention compared to before the intervention in the experimental arm (Wilcoxon = –531, $p < 0.001$), while in the control arm, this difference was not meaningful ($t_{39} = 0.78$, $p = 0.439$). Such findings were also found for all the dimensions of the TPB constructs [Table 3].

The mean changes in scores from before the intervention to the trial end are presented in Table 4. A substantial intergroup difference was seen in the mean change of the MBI score (t_{78}= –6.57, $p < 0.001$); so, the increase in mean change was considerably more in the experimental arm. Such findings were also found for all the dimensions of the TPB constructs, including "knowledge" (t_{78}= –5.22, $p < 0.001$), "attitude" (t_{78}= –7.7, $p < 0.001$), "perceived behavioral control" (t_{78}= –4.79, $p < 0.001$), "subjective norms" (t_{78}= –6.80, $p < 0.001$), and "behavioral intention" (t_{78}= –6.58, $p < 0.001$).

Discussion

In the present trial, we addressed the probable effect of a training program based on TPB in augmenting the self-care behavior of Iranians with CVA. Based on the findings, scores of MBI and TPB dimensions, including "knowledge," "attitude," "subjective norms," "perceived behavioral control," and "behavioral intention," significantly increased at the end of the trial among patients participating in the training program, compared to patients who received only usual care. Moreover, the mean changes of MBI and TPB dimensions in the experimental group in comparison to the baseline revealed significantly more increase at the trial end.

The current trial provided initial evidence supporting the impact of TPB application on improving the self-care of clients with CVA in Iran. The findings corroborated the previous related studies conducted in other countries among CVA survivors. In line with our results, in an RCT performed on Chinese middle-aged patients with CVA, self-management behavior was significantly more at 1 and 3 months after the intervention in patients who participated in a self-management program established on the integration of planned behaviors and health belief theories than in those who received routine treatment/care plus health education.[24] The consistency of our results with those mentioned above might be because the study population was patients with CVA in both investigations.

Table 3: Comparison of the study groups regarding the scores of self-care behavior and constructs of the theory of planned behavior

Variables		Control group (*n*=40)		Intervention group (*n*=40)		Between-group
		Mean (SD)	Median (IQR*****)	Mean (SD)	Median (IQR)	*p*
Self-care behavior	Before intervention	57.87 (20.80)	53.50 (44.25–71.75)	58.05 (26.94)	66.50 (36.00–79.75)	0.736*
	After intervention	56.97 (17.34)	57.50 (45.25–69.00)	69.20 (23.32)	73.50 (55.25–90.75)	0.005*
Within-group *p*		0.439**		<0.001***		
Knowledge	Before intervention	2.85 (1.09)	3.00 (2.00–4.00)	2.65 (0.92)	3.00 (2.00–3.00)	0.464*
	After intervention	2.70 (0.99)	2.50 (2.00–3.00)	3.87 (0.93)	4.00 (3.00–5.00)	<0.001*
Within-group *p*		0.395***		<0.001***		
Attitude	Before intervention	14.40 (3.90)	15.00 (11.00–17.00)	15.05 (3.81)	16.00 (12.50–17.75)	0.347*
	After intervention	13.87 (2.98)	14.00 (12.00–16.00)	20.97 (2.92)	21.50 (20.00–23.00)	<0.001*
Within-group *p*		0.286**		<0.001***		
Subjective norms	Before intervention	14.90 (3.90)	15.00 (12.00–17.00)	15.05 (4.01)	15.50 (12.00–18.00)	0.863****
	After intervention	13.87 (2.98)	14.00 (12.00–16.75)	18.20 (4.26)	19.00 (15.00–21.75)	<0.001****
Within-group *p*		0.255**		<0.001**		
Perceived behavioral control	Before intervention	16.52 (3.55)	16.00 (14.00–19.00)	17.67 (4.80)	19.00 (14.25–22.00)	0.160*
	After intervention	15.80 (3.30)	16.00 (14.00–18.75)	20.17 (3.64)	21.00 (18.25–23.00)	<0.001*
Within-group *p*		0.242**		<0.001***		
Behavioral intention	Before intervention	16.72 (3.25)	17.00 (14.25–19.00)	17.47 (4.21)	18.00 (13.25–21.00)	0.207*
	After intervention	16.32 (3.70)	17.00 (13.00–19.00)	20.07 (2.83)	20.50 (18.25–22.00)	<0.001*
Within-group *p*		0.376**		<0.001***		

*Mann–Whitney U test,**Paired samples t-test, ***Wilcoxon test,****Independent samples t-test, *****IQR=interquartile range

Table 4: Changes in the scores of self-care behavior and constructs of the theory of planned behavior from before to after the intervention in the study groups

Variables	Control group (*n*=40) Mean (SD)	Intervention group (*n*=40) Mean (SD)	Between-group *p**
Self-care behavior	−9.00 (7.27)	11.15 (8.29)	<0.001
Knowledge	-0.15 (1.25)	1.22 (1.09)	<0.001
Attitude	-0.52 (3.07)	5.92 (4.25)	<0.001
Subjective norms	-0.35 (1.91)	3.15 (2.62)	<0.001
Perceived behavioral control	-0.72 (3.85)	2.50 (2.20)	<0.001
Behavioral intention	-0.40 (2.82)	2.60 (2.77)	<0.001

*Independent samples *t*-test

Our findings showed that the patients who received a training program plus usual care had a higher score in all dimensions of TPB constructs than those who received only usual care. Similar to our finding on the efficacy of the intervention in increasing "behavioral intention," an RCT conducted in Indonesia among post-ischemic stroke patients found that TPB-based behavioral counseling was associated with a notable increase in the intention to prevent recurrent stroke at the intervention end, compared to routine care alone.[22] However, contrary to the current investigation, some studies found conflicting findings on TPB constructs.[21,23,40] In a quasi-experimental study, a 2-month stroke information campaign underpinned by TPB significantly improved the general population's behavior of calling emergency medical services for CVA suspicion at 12 months postintervention, whereas knowledge and attitudes regarding this disease were not altered as much as expected.[23] The study mentioned above was conducted on healthy populations. In contrast, in the current trial, patients with CVA were recruited. Also, differences in the study contexts, cultural issues, intervention protocols, and measures of TPB constructs could explain the inconsistency of the findings.

In other studies in Iran, the positive effect of TPB-based programs on the self-care of patients with different chronic diseases has been mentioned,[16-18,20,41] which aligns with the present study's findings. Hence, training programs based on TPB seem applicable to improve patients' self-care behaviors in the Iranian context. Accordingly, since nurses play an influential role in controlling CVA consequences, they could consider this approach along with other routine care/treatment programs to augment patients' self-care. Also, healthcare professionals and policymakers should underscore the beneficial role of this practice by instructing patients and their family members. The study could also be used in developing programs based on TPB for patients with CVA and for teaching health-care professionals how to use TPB to promote self-care behaviors among patients with CVA.

To the authors' knowledge, it is the initial attempt to use TPB in Iranian patients with CVA. The developed program could easily be reproduced and generalized in other contexts. We evaluated the program efficacy on both self-care and TPB constructs, which could be considered

the novelty of this study. Nonetheless, the findings should be interpreted cautiously because of some limitations. First, since the study was conducted during the lockdown period of Coronavirus Disease 2019 (COVID-19), the sampling period lasted about 1 year, which may affect the obtained findings. Second, although routine care was provided for patients in the control arm, identical to the experimental arm, the favorable effect of the TPB-based program might be because of the higher levels of the researchers' communication with patients in the experimental arm. Third, we could not conduct a long-term follow-up; therefore, we recorded the outcomes only 2 months after the intervention. Fourth, this trial was performed in a nonblinded design because the study-dependent variables were evaluated with self-report tools, and the patients could not be blinded, considering the nature of the TPB program. Also, due to the self-report approach to data collection, the patients might have under- or over-reported the outcomes. Finally, the generalizability of the findings might be limited, as only a sample of Iranian patients was recruited. Similarly, the obtained results cannot be generalized to patients who are unable to pursue self-care activities.

Conclusion

The short-term TPB-based training program, which included five in-hospital individual sessions for five consecutive weeks and weekly phone follow-ups during 2 months after discharge, effectively augmented CVA patients' self-care. However, further rigorous long-term studies must investigate similar programs' consequences. Since we used a self-report approach to data collection, the forthcoming trials can consider multiple informants' reports (e.g., family members' reports of self-care behaviors), direct monitoring of patients' self-care behaviors, and mixing quantitative and qualitative approaches to augment the reliability of data analysis.

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Conflicts of interest

Nothing to declare.

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