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Research Article

Development and Implementation of a Self-Management Program Based On the Five-A Model and Its Impact On the Self-Efficacy of Patients with Traumatic Brain Injury

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Abstract

Introduction: Patients with head injuries are considered the most challenging category of trauma victims, accounting for the second highest mortality rate in the country and the greatest loss of active years of life. The disabilities caused by these injuries have a significant impact on individuals' self-efficacy. This study aimed to develop and implement a self-management program based on the Five A's model and to assess its impact on the self-efficacy of patients with head trauma.

Method: This randomized controlled trial was conducted at Shohadaye Haftome Tir Hospital, which is affiliated with the Iran University of Medical Sciences. The study employed a pre-test and post-test design. A total of 70 patients who met the inclusion criteria were selected using a convenience sampling method. The self-efficacy questionnaire was completed by both the intervention and control groups prior to the intervention and at the three-month follow-up. Patients in the intervention group participated in eight 60-minute face-to-face self-management training sessions.

Result: The patients in the intervention group demonstrated a statistically significant enhancement in self-efficacy and its constituent dimensions following the intervention, compared to the pre-intervention period ($p < 0.001$). No statistically significant difference was observed in self-efficacy or its dimensions in the control group before and after the intervention. Partial eta-squared values were used to evaluate the magnitude of the intervention's impact. According to Cohen's classification, an effect size of 0.01 is considered small, 0.06 medium, and 0.14 large. A statistically significant difference was observed in self-efficacy and its dimensions between the two groups following the intervention, with the mean self-efficacy score in the intervention group being significantly higher than that in the control group ($p < 0.001$).

Conclusion： The implementation of a self-management program based on the Five A's model has the potential to enhance the self-efficacy of patients with traumatic brain injuries. Interventions such as educational self-management programs can provide support to these patients, thereby improving their self-efficacy, quality of care, and overall quality of life.

Keywords: self-management, self-efficacy, head trauma in patients.

Introduction

Trauma is defined as a mechanical injury to the body caused by an external force. A trauma patient is defined as an injured individual who requires timely diagnosis and treatment of actual or potential injuries by a multidisciplinary team of healthcare professionals, supported by appropriate resources to reduce or eliminate the risk of death or permanent disability [1]. According to the Institute for Health Metrics and

Evaluation, approximately 50 million individuals worldwide suffer acute disability as a result of trauma annually. [2]

Patients with head injuries represent the most challenging category of trauma victims. Head trauma is the most dangerous form of trauma and is the leading cause of death in traffic accidents and other traumatic events. In the contemporary era, a greater proportion of medical resources is allocated to the treatment of trauma victims compared to other diseases. A comprehensive understanding of the nature of trauma and the circumstances surrounding its occurrence is essential for the prevention, control, and reduction of injuries and complications. In most developing societies, post-traumatic stress disorder (PTSD) is recognized as a significant mental health issue. Furthermore, among individuals under the age of 30, trauma-related disabilities and mortality rates are more prevalent and higher compared to other diseases [1].

A trauma patient is also defined as an individual who has experienced a life-threatening event, such as a severe respiratory or cardiac emergency, cardiac or respiratory arrest, poisoning, an open chest wound, or severe internal or external bleeding [1, 2]. A sudden alteration in one's life circumstances resulting from a physical injury can have a significant effect on daily routines. In addition to potential physical limitations following a traumatic injury, studies indicate that injured individuals may experience mental health issues, including psychological distress, anxiety, depression, and post-traumatic stress disorder (PTSD) [2]. Accordingly, the objective of recovery from a physical injury should extend beyond the restoration of physical capabilities. Griffith and Jordan (1998) posited that a requisite condition for successful recovery is a sense of control and life satisfaction, in addition to consideration of potential physical injuries [3].

The extant literature indicates that recovery from trauma is a complex process. It is therefore important to minimize the risk of developing psychological and emotional disorders while ensuring the continuation of optimal trauma care for individuals who have experienced an incident. Furthermore, numerous studies have underscored the significance of prompt trauma treatment and subsequent care. In accordance with Bandura's perspective, individuals should be educated in monitoring their health behaviors and the conditions in which these behaviors occur. Furthermore, they should use proximal goals to motivate and guide their behavior. The management of a disease is inherently a problem-based endeavor. The successful self-management of a disease thus requires the development of six key skills: self-management, problem-solving, decision-making, resource utilization, the establishment and maintenance of a sustainable partnership between the patient and the provider, and action planning. These skills are of great importance for self-management in a variety of conditions.[4,3]

Self-management support can be observed in two forms. The first is a set of techniques and tools that assist patients in making healthy behavioral choices. The second is a fundamental shift in the patient–professional caregiver relationship, moving toward a collaborative approach to care. The concept of self-management support extends beyond the scope of a conventional educational program or the mere dissemination of information or disease management. The primary objective of self-management programs is to modify behavior within the context of collaborative management to achieve long-lasting outcomes. A review of the literature reveals a lack of awareness among patients regarding self-management and behavior change. It is evident that patients need to acquire awareness in order to navigate the various situations they encounter [5, 6]. In a self-management program, the patient is the primary agent of their own care, and all activities related to care and treatment are oriented toward the objective of enhancing the patient's health. The goal of this program is to facilitate maximal independence, self-determination, and health promotion based on individual abilities and lifestyle, while concurrently enhancing patients' quality of life [7].

The organization, formulation, and presentation of a self-management program for patients constitutes a professional intervention. Formal support has been shown to enhance patient empowerment, independence, and growth, while also reducing the need for reliance on hospital services compared to informal support [8]. A review of the literature in patient care reveals several factors that contribute to the development of concerns and stress among patients. These include the lack of

effective educational programs, insufficient information regarding how to access rehabilitation programs, and the absence of effective communication between the treatment team and patients. Such tensions and concerns can negatively impact patients' self-efficacy and self-belief. The results of studies by researchers indicate that self-management and behavior modification training programs can increase awareness, skills, and self-efficacy, and improve health-related care behaviors in patients [9].

The extant literature on the impact of self-management programs on self-efficacy is limited. The findings of a study by Pirfalak and colleagues (2020) indicated that training in the use of assistive mobility devices for individuals who have experienced a stroke resulted in enhanced self-esteem and self-efficacy in managing disease-related complications. The study by Taylor and colleagues (2022) demonstrated that interventions addressing the relationship between physical and mental health, including the consideration of mood, emotions, stress, fear, and anxiety to improve psychological responses to acute trauma, can enhance patients' self-efficacy and recovery [10]. As evidenced by Farley's study, enhancing self-efficacy can facilitate the modification of health-related behaviors and influence levels of effort, performance, and participation in beneficial behaviors such as symptom management, physical activity, nutritional habits, treatment adherence, and alternation between rest and activity. Consequently, this enhances operational capacity [11]. In a comprehensive review, the researchers stated that although self-management training can have benefits, insufficient data are available to reach a definitive conclusion due to the lack of similar studies and the absence of examination in patients with different diagnoses. Accordingly, further research in this area is required [12].

Several studies have focused on the implementation of the Five A's self-management model and its influence on patients' quality of life. Nevertheless, studies examining self-efficacy using educational programs, patient follow-ups, and initiatives based on the Five A's model remain scarce. The results of the conducted studies indicate that the impact of implementing the Five A's self-management model on patients' quality of life has been considered. In light of the aforementioned evidence, patients require support in multiple emotional, informational, caregiving, educational, and instrumental capacities. Given the high prevalence of head injuries and their associated long-term complications, as well as the numerous benefits of self-management educational methods, this model has the potential to activate the capacity for self-management and provide positive feedback regarding the effectiveness of self-care [13]. The present study was conducted with the objective of examining the impact of implementing a self-management program based on the Five A's model on the self-efficacy of patients with head trauma at Shohadaye Haftome Tir Hospital.

The study was conducted with the following specific aims:

To develop and implement a self-management program based on the Five A's model.

To assess the impact of the program on the self-efficacy of patients with head trauma.

Methods

Study Design and Setting

This study was a randomized controlled trial with a control group, conducted among patients with head trauma at Shohada-ye Haftom-e Tir Hospital, which is affiliated with the Iran University of Medical Sciences. The study population comprised all patients with head trauma who visited the Shohada-ye Haftom-e Tir Hospital Educational and Treatment Complex between January 2024 and May 2024, as well as those who attended the clinic or patient education unit for periodic outpatient examinations.

Inclusion and Exclusion Criteria

The inclusion criteria were: age over 18 years; literacy in reading and writing; no prior participation in educational programs related to the research topic; at least one-month post-initial head trauma, having passed the acute stage of the disease; and moderate to severe dependency levels based on the Barthel Index.

The exclusion criteria were: absence from or non-attendance at 2–3 training sessions; unwillingness to continue participation in the research; and experiencing an acute condition or death during the study period.

None of the patients met the exclusion criteria after entering the study.

Sample Size Calculation

To determine the required sample size at a 95% confidence level and 80% power, and considering a Cohen's effect size of 0.7 for patient self-efficacy in the intervention group compared to the control group, the sample size was calculated using the formula

$$n = \frac{2\times(z_{1-\alpha/2}+z_{1-\beta})^2}{E.S^2}$$

The calculated sample size for each group was 32 individuals. After accounting for a 10% dropout rate, the estimated sample size for each group was adjusted to 36 individuals. Consequently, the final sample size for each group was determined to be 36 individuals.

Random Allocation

Concurrently with continuous sampling, the assignment of research units to the experimental and control groups was conducted using random block allocation. In the block allocation method, blocks of equal size (typically four or six) were created, with half of the individuals in each block randomly assigned to one group and the other half to the other group. This process continued until the required sample size was achieved.

In this study, using blocks of four, 70 individuals were assigned to two groups of 35 (labeled A and B). Initially, all possible combinations of four individuals where half were allocated to group A and the other half to group B were identified. These combinations are listed below:

A A B B - A B A B - B A A B - B B A A - B A B A - A B B A

Each of the quadruple combinations was assigned a digit from 1 to 6. Subsequently, 35 quadruple blocks were randomly selected, and their combinations were recorded in sequence. For this purpose, sampling with replacement was conducted 35 times from this four-member population. There were no confounding varibles in the study.

Data Collection Tools

The data collection tools included a demographic data form and a self-efficacy questionnaire. The self-efficacy questionnaire was developed based on the Chronic Patient Self-Efficacy Questionnaire created by Lorig and colleagues (1993) at Stanford University in the United States. The validity and reliability of this scale were established by Lorig and colleagues (1996) using a Cronbach's alpha of 0.92 and a correlation coefficient of 0.88.

This questionnaire underwent psychometric evaluation and translation by Sharif Nia and colleagues (2017), with its cultural adaptation, validity, and reliability thoroughly examined and confirmed. The reliability of the questionnaire exceeded $\alpha > 0.7$. It has been utilized in Iran to assess the self-efficacy of stroke patients and demonstrated the necessary validity and reliability [17].

The self-efficacy questionnaire comprises eight dimensions:

Regular exercise

Acquiring information about the disease

Seeking assistance from the community, family, and friends

Communicating with the doctor

Overall disease management

Performing daily tasks

Engaging in recreational and social activities

Managing symptoms, controlling shortness of breath, and addressing depression

Scores can be calculated for each of the eight areas, and an overall score is also derived. The subcategories include: regular exercise (three questions), acquiring information about the disease (one question), seeking assistance from the community, family, and friends (four questions), communicating with the doctor (three questions), overall disease management (five questions), performing daily tasks (three questions), engaging in recreational and social activities (two questions), symptom control (five questions), managing shortness of breath (one question), and addressing depression (six questions).

Responses for all dimensions are rated on a scale from 1 to 10, where a score of 1 indicates "I am not confident

at all" and a score of 10 indicates "I am completely confident," with higher scores reflecting greater self-efficacy. Sharif Nia found the correlation for these dimensions to range between 0.72 and 0.89. The questionnaires were completed by patients with head trauma via self-report under the direct supervision of the researcher.

Blinding and Group Separation

To prevent the control group from becoming aware of the intervention, data collection was scheduled on separate days: the control group completed the questionnaires on even-numbered days and the intervention group on odd-numbered days. As a result, participants in each group remained unaware of the other group's presence or involvement throughout the study period.

Intervention

From the outset of selecting individuals for the experimental group, the study's objectives, implementation steps, and necessary actions for participation were clearly explained, and participants were invited to attend the training sessions. Additionally, they were asked to provide their phone numbers and to confirm their readiness and willingness to participate in the study.

Prior to participation, informed consent forms were completed and signed by participants in both groups. All ethical considerations, including the option to withdraw from the study at any stage and the right to withhold information during the consent process, were thoroughly explained to participants and upheld by the researcher. After patients agreed and completed the consent form, demographic information forms were filled out before the intervention commenced for both the control and experimental groups.

This quantitative study employed an experimental design with two groups. The experimental group received an educational care plan for patients with head trauma, which included a combination of an educational program and telephone follow-up. In contrast, the control group received only standard care or follow-up at the time of discharge from the hospital. Before the intervention began and after obtaining consent, the self-efficacy questionnaire was administered to both the control and experimental groups.

The flow of the quantitative intervention and the method of allocating participants to the study groups are illustrated in the following diagram.

Designing and Developing a Self-Management Program Based on the Five A's Model

Step One (Assessment): After obtaining ethical approval from the Tehran University of Medical Sciences and securing the consent of the research environment authorities, the researcher visited the clinic, the patient education unit, and the discharge unit of Shohadaye Haftome Tir Hospital. Patients presenting with head trauma who met the inclusion criteria were selected and provided with comprehensive explanations about the research objectives. Those willing to participate in the study signed an informed consent form. Using questionnaire forms, a detailed examination of self-efficacy levels among patients in the intervention and control groups was conducted, along with the collection of demographic information and the completion of the Sherer self-efficacy questionnaire. All patients were asked to respond to the questionnaires carefully. Additionally, the researcher conducted interviews to further identify problems in the intervention group.

Step Two (Guidance): Based on the assessment conducted in Step One, each patient's problems were listed separately. The risks arising from low self-efficacy, based on the issues extracted from the self-efficacy questionnaire and the interviews, were communicated to each patient individually.

Step Three (Agreement): In this stage, an agreement was made with patients in the intervention group to reduce or eliminate the identified problems by setting and adjusting realistic behavioral goals. Thus, the researcher developed a program to address the issues with the patients' participation, and they were asked to adhere to this educational program.

Step Four (Assistance): Based on the researcher's assessments and the issues faced by patients in the intervention group, they were invited to participate in eight training sessions aimed at achieving goals and addressing problems, organized in groups of up to five people. These sessions were held one week after the first individual training session. The training was conducted based on the patients' issues, utilizing slides, lectures, and an educational booklet that included written content, images, and videos. Training sessions were

held in the library unit of Shohadaye Haftome Tir Hospital. Each session was planned for 60 minutes but lasted up to 90 minutes. The intervals between sessions were three days. The content of the patient education booklet was designed based on the assessment of the needs of similar patients (e.g., determining the level of consciousness, types of head trauma, diagnostic and therapeutic methods, complications of trauma, and strategies to reduce complications), as well as interviews with patients, patient education supervisors, and neurologists. The booklet was compiled with input from ten professors from universities in Tehran.

Step Five (Follow-up): The performance of patients in the intervention group was followed up for three months to ensure the implementation of educational programs. This follow-up was conducted through phone calls and in-person visits to the patient education unit at Shohadaye Haftome Tir Hospital. During the first two weeks after the completion of the training, daily phone consultations were conducted, followed by weekly reminders to reinforce the implementation of the educational program.

Post-Intervention Assessment

After three months, the same questionnaires were again provided to patients in both groups, and they were assessed regarding the studied variables. The control group received only usual care. After data collection, the educational materials and booklet were also provided to patients in the control group.

Data Analysis

For data analysis, descriptive statistics, paired t-tests, independent t-tests, chi-square tests, and Fisher's exact test were used. All analyses were performed using SPSS version 21, with a significance level set at $p < 0.05$.

Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki. Approval from the Institutional Review Board (code: IR.IAU.PS.REC.1403.074) was obtained from the Ethics Committee of Tehran University of Medical Sciences. The present study did not interfere with the diagnosis or treatment process of patients, and all participants signed an informed consent form.

Results

The mean age of the research units in the training and control groups was 43.4 years, with a standard deviation of 19.33, and 38.69 years, with a standard deviation of 15.7, respectively. The majority of research units in both groups were men (80%), single individuals (57.1%), those employed in self-employed jobs (48.6%), individuals with primary education (34.3%), living with a spouse and children (45.7%), receiving post-discharge care from a spouse (37.1%), residing in Tehran (91.4%), having insurance (60%), having supplementary insurance (68.6%), and using tobacco (60%) (Table 1).

The results of the paired t-test indicate that in the control group, there is no statistically significant difference between the mean scores of the domains, dimensions, and total self-efficacy score before and after the intervention. However, in the test group, a statistically significant difference was observed between the mean scores of the domains, dimensions, and total self-efficacy score before and after the intervention ($P < 0.001$) (Table 2).

The results of the independent t-test indicated that prior to the intervention, there was no statistically significant difference in the mean total self-efficacy score and its dimensions between the test and control groups. However, three months following the intervention, there was a statistically significant difference in the mean total self-efficacy score ($P < 0.001$) (Table 3).

Self-efficacy scores exhibited a statistically significant difference between the intervention and control groups ($p < 0.001$), with participants in the intervention group reporting significantly higher mean self-efficacy scores than those in the control condition. The intervention yielded a medium effect size (Cohen's $d = 0.265$), suggesting that approximately 26% of the observed variance in post-intervention self-efficacy levels can be accounted for by the therapeutic intervention. This finding underscores the potential efficacy of the intervention in enhancing trauma-related self-efficacy, a critical psychological resource in post-traumatic recovery.

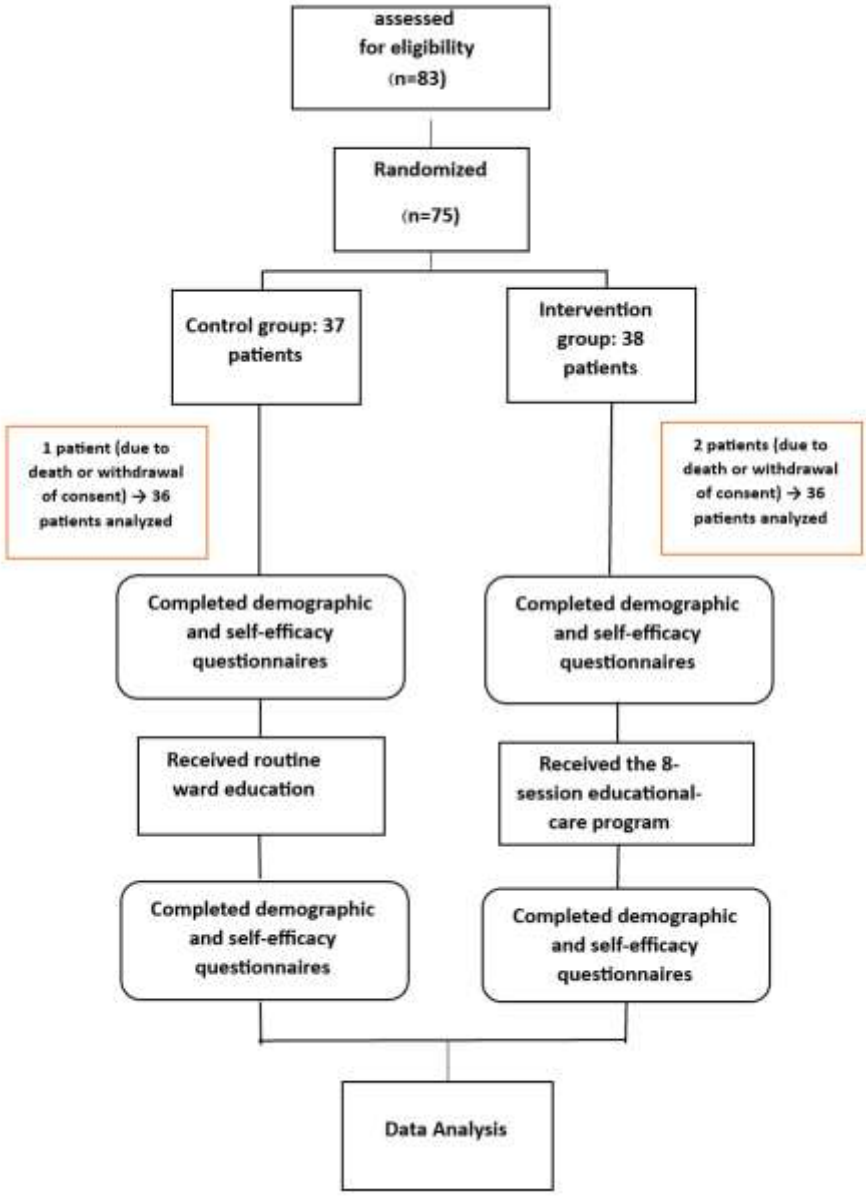

Fig.1 Subject's enrollment, randomization, and data gathering process in both groups

Table 1: A comparative analysis of the demographic and clinical characteristics of the interventional and control groups

Personal Features	Case	Control	Test Result Independent t-test
	frequency(%)	frequency(%)	
Age (Year)			t=1.12 df=68 P=0.267
Under 30	(25.7)9	(31.4)11	
30-39	(22.9)8	(22.9)8	
40-49	(17.1)6	(20)7	
50-59	(22.9)8	(11.4)4	
60 and above	(11.4)4	(14.3)5	
	(100)35	(100)35	
Gender			Chi-squared test χ^2 =1.806 df=1 p =0.179
Male	(80) 28	(65.7)23	
Female	(20)7	(34.3)12	
	(100)35	(100)35	
Marital Status			Fisher's Exact Test p =0.722
Single	(57.1)20	(57.1)20	
Married	(31.4)11	(37.1)13	
Devorced. widowed	(11.4)4	(5.7)2	
	(100)35	(100)35	
Job			Fisher's Exact Test p =0.417
employee	(20)7	(17.1)6	
self-employment	(48.6)17	(42.9)15	
retired	(8.6)3	(0)0	
labor	(5.7)2	(11.4)4	
housekeeper	(8.6)3	(20)7	
Out of order	(8.6)3	(8.6)3	
	(100)35	(100)35	
Education Level			Fisher's Exact Test p =0.751
primary	(34.3)12	(37.1)13	
Sub diploma	(22.9)8	(25.7)9	
diploma	(22.9)8	(20)7	
expert	(17.1)6	(8.6)3	
master's and above	(2.9)1	(8.6)3	
	(100)35	(100)35	
Who do you live with			Fisher's Exact Test p =0.92
alone	(8.6)3	(14.3)5	
Spouse and children	(45.7)16	(48.6)17	
children	(14.3)5	(8.6)3	
parents	(25.7)9	(22.9)8	
Other	(5.7)2	(5.7)2	
	(100)35	(100)35	
Who will take care of you after discharge			Fisher's Exact Test p =0.998
wife	(37.1)13	(37.1)13	
children	(17.1)6	(14.3)5	
parents	(37.1)13	(28.6)10	
myself	(8.6)3	(11.4)4	
friends	(2.9)1	(2.9)1	
Other	(5.7)2	(5.7)2	
	(100)35	(100)35	
place of residence			Chi-squared test

Tehran	(91.4)32	(80)28	$\chi^2 = 1.867$ df=1 p =0.172
City	(8.6)3	(20)7	
	(100)35	(100)35	
insurance			Chi-squared test $\chi^2 = 0.233$ df=1 p =0.629
Has	(60)21	(54.3)19	
does not have	(40)14	(45.7)16	
	(100)35	(100)35	
Supplementary insurance			Chi-squared test $\chi^2 = 0.65$ df=1 p =0.42
Yes	(31.4)11	(22.9)8	
No	(68.6)24	(77.1)27	
	(100)35	(100)35	
Smoking (cigarette, pipe, hookah)			Chi-squared test $\chi^2 = 0.56$ df=1 p =0.454
Yes	(40)14	(31.4)11	
No	(60)21	(68.6)24	
	(100)35	(100)35	

Discussion

The objective of this study was to examine the impact of a self-management program on the self-efficacy of patients with head trauma. The results demonstrated that the mean and standard deviation of the total self-efficacy score prior to the intervention were relatively low in both the experimental and control groups. This finding is consistent with the results of studies conducted by Net et al. (2021) and Ebrahimpour et al. (2021), who also indicated that patients' self-efficacy levels were relatively low.

The results of the present study demonstrated that in the intervention group, the mean total self-efficacy score and the mean scores in various dimensions of self-efficacy showed a statistically significant difference before and after the intervention. This indicates that the self-management education program enhanced the self-efficacy of these patients. In contrast, in the control group, the mean total score and the dimension scores of self-efficacy remained unchanged before and after the intervention.[14,15]

A comparison of self-efficacy between the intervention and control groups prior to the implementation of the self-management educational program revealed that they had homogeneous overall self-efficacy scores. Following the intervention, a significant difference was observed in the mean overall self-efficacy scores between the two groups. It can therefore be concluded that the self-management educational program had a positive impact on the self-efficacy of patients with head trauma. This finding is consistent with the results of other studies on patients with head injuries and certain chronic diseases.

The findings of a study by Zhang and colleagues (2021) indicated that the Five A's nursing intervention model was effective in enhancing the self-care efficacy and quality of life of patients undergoing chemotherapy following liver cancer surgery [16]. Furthermore, this intervention was found to alleviate cancer-related fatigue during treatment and enhance patient satisfaction with nursing care. The findings of Zhang's study align with those of previous research on other chronic diseases. However, that study differed from the present research in that it was conducted on patients undergoing chemotherapy, whereas the present study focused on patients with head trauma. Additionally, the educational methods employed in the two contexts were distinct [16].

The study by Asgharian et al. (2022) demonstrated that through consistent educational planning, ongoing monitoring, and the provision of encouragement and motivation, individuals can be guided toward the adoption of effective coping strategies [21]. In the present study, a self-management program was employed to enhance patients' self-efficacy, and coping strategies were not a focus. However, in both studies, regular

educational planning and telephone follow-ups were conducted.

A study titled "A Self-Management Program Based on the Five A's Model on the Self-Efficacy of Elderly Patients with Diabetes" reported a statistically significant difference in self-efficacy dimension scores in the intervention group [17]. The present study examined the self-efficacy of patients with head trauma and did not focus solely on the elderly. Instead, individuals from different age groups diagnosed with head trauma were included.

A study conducted by Salama and colleagues (2020) in Egypt demonstrated a notable enhancement in metabolic indicators following the implementation of an intervention. The scores on the Diabetes Self-Management Questionnaire showed a notable improvement among patients in the intervention group compared to the control group following the intervention. The findings suggested that the implementation of the Five A's self-management model is an efficacious approach for enhancing metabolic control indicators in patients with type 2 diabetes [18]. The findings of the present study align with those of previous research in this field. However, in the present study, the construct of self-efficacy and its constituent dimensions were taught and evaluated, whereas in Salama's study, only metabolic control indicators were examined.

The results of this study are also consistent with those of the study by Rahmani et al. (2019), titled "Educational Intervention Based on Self-Care Behaviors on the Self-Efficacy of Patients Undergoing Coronary Artery Bypass Surgery." The researchers concluded that implementing an educational intervention based on self-care behaviors can lead to an improvement in the self-efficacy of patients who have undergone coronary artery bypass graft surgery [19].

Conclusion

The implementation of a self-management program based on the Five A's model, as demonstrated by the present study, has the potential to enhance the self-efficacy of patients with traumatic brain injury. It is recommended that healthcare providers, particularly nurses, implement self-management educational programs for these patients, as this would constitute an effective step toward enhancing their self-efficacy.

In light of the constraints inherent to the research design, further studies in this area are clearly needed. In this study, the training period and intervention examination were conducted over three months with a limited number of patients. It is therefore necessary to investigate the long-term effects of this intervention on a larger population of patients with head trauma. Given the potential for patients to play an active role in their own care, it is also recommended that a study be conducted to examine the impact of family-centered self-management education on the self-efficacy behaviors and quality of life of these patients.

One of the primary limitations of this study was that trauma patients, due to the psychological conditions resulting from their injuries, experienced significant psychological stress. This made it challenging to capture their attention and secure the necessary cooperation for participation in time-consuming and demanding educational sessions. Additionally, some patients were unable to provide accurate and complete information due to factors such as brain injury, reduced levels of consciousness, speech impairments, or poor concentration. Consequently, the data collection process and the delivery of educational content required more time. At times, it was only feasible to complete the steps repeatedly while incorporating appropriate breaks.

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Conflict of Interest Disclosures

The authors declare that they have no competing interests.

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Authors' Contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

Ethical Statement

This study was conducted in accordance with the Declaration of Helsinki and received approval from the Institutional Review Board (code: IR.IAU.PS.REC.1403.074) of the Ethics Committee at Tehran Azad University of Medical Sciences. Additionally, the clinical trial was registered (IRCT20240201060878N1). The present study did not interfere with the interfere with the process of diagnosis and treatment of patients and all participants signed an informed consent form.

Declaration of Generative AI and AI-assisted technologies

Not cleared.

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