



The Effect of Face-to-Face Education and Video Training on the Knowledge of Patients Requesting Bone Marrow Transplantation in a Teaching Hospital

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Abstract

Background: Patients' education increases their knowledge regarding their diseases, treatment, and related problems. To enhance the effectiveness of education, it is necessary to use appropriate teaching methods. This study aimed to compare the effect of face-to-face education and video training on patients requesting bone marrow transplantation.

Methods: This semi-experimental study was conducted from May 2018 to January 2019 in the bone marrow transplantation department of a teaching hospital affiliated with Kerman University of Medical Sciences. A total of 68 patients were assigned to two groups: face-to-face education and video training. Face-to-face education consisted of three 40-minute sessions a week before transplantation. In the video training method, the video was made available to the patient one week before admission. In both groups, patients' knowledge levels were examined before and after training using a two-part questionnaire. SPSS software version 18 was used to analyze the data.

Results: The mean age of patients was higher in the video training group (52.47 ± 15.15) than in the face-to-face education group. The majority of patients in both groups were men, with 55.89% in the video group and 58.82% in the face-to-face group. The mean knowledge score in both groups significantly increased after the intervention (from 3.70 ± 0.03 to 9.38 ± 0.04 in the video group and from 3.52 ± 0.04 to 9.14 ± 0.65 in the face-to-face group) ($P=0.001$). However, there was no significant difference between the two groups ($P=0.970$).

Conclusion: The results of this study showed that educational interventions could increase patients' knowledge levels. Therefore, depending on the patient's condition, either of the training methods can be selected.

Keywords: Bone marrow transplantation, Face-to-face education, Knowledge, Patients, Video training

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Introduction

Bone marrow transplantation is a standard treatment for blood malignancies, solid tumors, immunodeficiency diseases, and metabolic disorders (1). This method requires the use of high doses of chemotherapy, radiotherapy, or both to treat cellular defects or diseases (2). Most patients requesting bone marrow transplantation lack knowledge about their disease (3) and usually do not have enough information about the treatment. Consequently, many questions may come to their minds, leading to anxiety and stress (4). Providing the necessary information can reduce negative outcomes in patients and help them avoid psychological distress. A detailed understanding of the diagnosis, treatment process, and support systems is crucial for patients. With this knowledge, patients can take

steps to improve their health. Accordingly, they are better able to manage their illness and achieve a desired quality of life (5). Moreover, understanding the ins and outs of their condition contributes to their greater engagement in the treatment process (6).

The results of a study at the University of Sydney on 62 patients showed that patient education increased satisfaction with the treatment process (7). Undergoing surgery is a unique and stressful experience that reduces the ability to learn and focus on the provided training (8). Existing evidence indicates that patients suffer from a lack of information needed for preoperative preparation and postoperative care (6,9).

In addition to extensive training in medication and post-transplantation care, the most important pre-,



intra-, and post-transplantation training items include accessing arteries, selecting a required diet, recognizing symptoms of infection, preparing stem cells, performing transplantation, managing post-transplantation complications, and understanding financial resources. This information must be provided to both the patient and their family members (10). It should be noted that this this understanding can be achieved through effective interaction and communication. Regarding the relationship between physicians, nurses, and patients, research indicates that there is not enough time for staff to properly train patients (11,12). Patients, on the other hand, have been reported to forget about 80% of what physicians tell them, and almost 50% of the information they remember is inaccurate. Therefore, selecting an effective training method in this situation is critical (13).

There are various teaching methods, such as lecture, discussion, video training, and face-to-face education, which are used individually or in groups. One of the most popular educational methods in healthcare is face-to-face education, which is considered the key standard for patient education (11). In this method, the trainer provides training to the individual learner and creates an opportunity for ideas and feelings to be exchanged verbally and non-verbally between the learner and the educator (14).

On the other hand, in the last decade, due to significant developments that IT has made in every aspect of life, the production of multimedia educational materials has gained attention. Multimedia training materials are among the best methods for delivering a high volume of information with proper diversity in an electronic format, such as a CD, DVD, or VCD (15). Video training is an effective, convenient, and affordable way of teaching because it reduces the need for teachers, books, and time (16). This method is particularly beneficial for patients with lower literacy levels by engaging their visual and auditory senses. The findings of Tou and colleagues' study showed that video training reduced anxiety before bowel surgery (17). Research has also shown that 75%, 13%, and 12% of information is received and remembered through sight, hearing, and other senses, respectively (18). Thus, how patients respond to information depends on how it is presented (19).

Examining the existing literature shows that the outcomes of face-to-face education and video training vary across different studies, with some focusing solely on video training (20,21) and others reporting no differences between face-to-face education and video training (22). In a study on the effect of self-care education through video on the quality of life and physical problems of hemodialysis patients, Baraz-Pardanjani et al showed that implementing a self-care educational program through video could effectively reduce problems and improve the quality of life in patients undergoing hemodialysis (23).

The results of the present study can provide fundamental information for managers and policymakers in healthcare systems to enhance the knowledge of bone marrow transplant patients. If necessary, these findings can be utilized to increase patient knowledge in medical centers. In addition, the study can be used in clinical programs to improve the knowledge of patients requesting bone marrow transplantation.

Since no evidence has been found comparing the effects of face-to-face education and video training on patients requesting bone marrow transplantation, which is a stressful procedure, this study aimed to compare the effects of these two methods in such patients at a teaching hospital in Kerman.

Methods

This semi-experimental study was conducted from May 2018 to January 2019 in the bone marrow transplantation department of a teaching hospital affiliated with Kerman University of Medical Sciences. This center is the only specialized facility for bone marrow transplantation in southeastern Iran.

Sampling was based on a convenience method. After matching for gender, age, and type of disease, all patients requesting bone marrow transplantation who had not previously received training in the treatment process and were referred to the bone marrow transplantation department of Afzalipour Hospital were divided into two groups, face-to-face education and video training, based on a random number table. G-Power software was used to calculate the sample size. Considering an alpha error of 5%, a confidence interval of 93%, and an effect size of 15%, a sample size of 34 was calculated for each group. The first sample was assigned to the face-to-face education group by drawing. The remaining samples were then assigned to each group after adjusting for age, gender, and diagnosis. Due to isolation conditions, the patients were completely separated from each other, were admitted individually, and had no communication with one another.

Inclusion criteria were being over 15 years of age, Iranian nationality, the ability to speak Persian, lack of verbal, psychological, and visual impairments, and non-use of anxiolytic drugs. Patients who had previously undergone transplantation training were excluded.

A two-part questionnaire was used for data collection. The first section was prepared by researching and studying the latest sources and related articles, as well as consulting with experts. This part contained questions about demographic and occupational characteristics including age, gender, occupation, economic status, marital status, type of insurance, education, patient diagnosis, source of hematopoietic stem cells, type of transplant, and family history of previous bone marrow transplantation experience. The second part was a researcher-made questionnaire called "Patient Knowledge

Level Survey,” based on a literature review. The validity of this questionnaire was evaluated by faculty members from the Faculty of Nursing and Midwifery Razi, as well as by oncology and bone marrow transplantation specialists. The reliability of the questionnaire was calculated as 0.79 using Cronbach’s alpha coefficient. The questionnaire consisted of 22 questions divided into three sections. The first part addressed basic information about stem cells and stem cell transplantation. The second part included basic information about the types of transplantation, stem cell preparation, and complications related to stem cell isolation. The third part covered basic information on transplantation and post-transplantation care. The questionnaire was scored on a two-point scale: 0 (false) and 1 (true). In this study, scores of 22 and 0 were considered the highest and lowest scores, respectively.

Face-to-face education consisted of three 40-minute sessions a week before transplantation. The first session included training on stem cells, how to prepare stem cells, the type of transplant, and how to access arteries. The second session included training on the types of pre-transplantation treatments (chemotherapy, radiotherapy, or both), intra-chemotherapy and radiotherapy care, and how to perform the transplantation. The third session focused on post-transplantation care and transplantation complications. The training was conducted by a researcher in the bone marrow transplantation unit, in a quiet room, individually. An educational pamphlet on the subject was given to the patients at each session. The researcher’s contact numbers were also provided so that the patients could reach out with any questions. Patients’ knowledge levels in the face-to-face education group were assessed again on the day of admission before entering the department.

In the video training method, the video was made available to the patient one week before admission. In this VCD, a patient who had recently undergone bone marrow transplantation discussed how to receive transplants and shared experiences of the process for 30 minutes. Moreover, various aspects of the transplantation process were presented to the patient. Patients’ knowledge levels in the video training group were assessed again on the day of admission before entering the department.

After approving the project and receiving the clinical trial code (IRCT20180615040108N1) and the code of ethics from the Kerman University of Medical Sciences Ethics Committee (IR.KMU.REC1397.160), the aims of the project were explained to the patients, and the confidentiality of their information was emphasized. Moreover, the patients’ informed consent was obtained, and their knowledge was assessed in the two groups two days before the training.

Statistical analysis

SPSS 26 software was used for the statistical analysis of

the assumptions of this research, and GraphPad Prism 8 software was used for drawing graphs. A significance level of 5% was considered the threshold for rejecting the null hypothesis. In this analysis, repeated measures ANOVA, independent sample t-test, chi-square test, and Fisher’s exact test were used.

Results

In this study, the knowledge of 68 patients requesting bone marrow transplantation (34 in face-to-face education and 34 in video training) was evaluated. The mean age of patients in the face-to-face education group was 51.70 ± 14.32 years. The majority of patients in this group were men (58.82%). Among these patients, 85.30% were married. The economic status of most patients in this group was average (64.70%), and most were unemployed (32.35%). The literacy rate in this group was 23.50%. The mean age of patients in the video training group was 52.47 ± 15.15 years. The majority of patients in this group were men (55.89%). In this group, 82.36% of patients were married, and most had average economic status (58.82%). About half of the individuals in this group were unemployed. The education level of 26.50% of patients in this group was above high school diploma. There was no significant difference between the two groups regarding these underlying variables (Table 1).

In both groups, 64.70% of patients had multiple myeloma, 23.50% had Hodgkin or non-Hodgkin lymphoma, 5.90% had acute myeloid leukemia, 2.90% had Ewing sarcoma, and 2.90% had germ cell tumors. The source of stem cells in both groups was peripheral blood stem cell transplantation, and the transplants were autologous. None of the patients had previous transplantation experience. There was no significant difference between the two groups in terms of clinical variables.

Since there were no significant demographic differences, a one-way repeated measures ANOVA test was used to check the level of knowledge before and after the intervention in both groups. The result of this test is given in Table 2. The result showed that with an alpha error of 5% (95% confidence interval):

- 1) Regardless of whether the type of intervention was video or face-to-face, the patients’ knowledge levels increased significantly after the intervention ($P < 0.0001$).
- 2) The increase in knowledge levels was the same in both groups ($P = 0.450$).
- 3) The level of knowledge in the face-to-face group increased to the same extent as in the video group ($P = 0.700$).

The mean knowledge score in the face-to-face education group was 106.85 ± 10.23 before the intervention and 112.23 ± 8.47 after the intervention. In other words, the knowledge scores of this group increased by 5.38 points after the intervention. The mean score of patients’

Table 1. Demographic characteristics of patients

Characteristics	Group	N	Mean	SD	Median	IQR	P value
Age	Video	34	52.47	15.15	54.00	20.75	0.800
	Face to face	34	51.70	14.32	54.00	24	
Characteristics	Group		χ^2	P value			
	Film No. (%)	Face to face No. (%)					
Gender	Male	19 (55.89)	20 (58.82)	0.06	0.800**		
	Female	15 (44.11)	14 (41.18)				
Marital status	Single	3 (8.82)	4 (11.76)	2.16	0.54**		
	Married	28 (82.36)	29 (85.30)				
	Dead wife or husband	2 (5.88)	0 (0)				
	Divorced	1 (2.94)	1 (2.94)				
Economic conditions	Weak	14 (41.18)	12 (35.30)	0.24	0.610**		
	Moderate	20 (58.82)	22 (64.70)				
Job	Unemployed	17 (50.00)	11 (32.35)	5.558	0.351*		
	Employed	2 (5.89)	2 (5.88)				
	Farmer	3 (8.83)	8 (23.52)				
	Retired	6 (17.64)	3 (8.83)				
	Free job	6 (17.64)	10 (29.42)				
Education	Illiterate	7 (20.58)	7 (20.58)	3.170	0.673*		
	Low literacy	9 (26.47)	8 (23.52)				
	Guidance school and high school	4 (11.76)	5 (14.70)				
	Diploma	5 (14.70)	7 (20.58)				
	Associate degree	3 (8.82)	2 (5.88)				
	Bachelor	4 (11.76)	1 (2.94)				
	Masters and Ph.D	2 (5.88)	4 (11.76)				

The symbols * and ** indicate Fisher's exact test and chi-square test, respectively.

Table 2. Comparison of the mean knowledge score of patients in two groups before and after educational intervention

Descriptive statistics					Analytical statistics		
Time	Group	Mean	SD	N	Time (F)	Group (F)	Interaction (F)
Knowledge (Before)	Film	3.70	0.03	34	<0.010 (22480.18)	0.990 (24.46)	0.120 (0.63)
	Face to face	3.52	0.04	34			
Knowledge (After)	Film	9.38	0.04	34			
	Face to face	9.14	0.65	34			

knowledge in the video training group was 105.76 ± 10.36 before the intervention and 106.30 ± 10.23 after the intervention. Thus, the knowledge scores of this group increased by 0.54 points after the intervention. The mean knowledge score in both groups was significantly increased after the intervention ($P < 0.05$) (Table 2). The mean difference in knowledge scores was higher in the face-to-face education group than in the video training group, although it was not significant ($P = 0.970$) (Table 3).

The result in Table 2 shows that the average knowledge in the face-to-face and video groups increased by the same amount ($P = 0.990$). Considering that the effect of time alone was significant, it can be concluded that both face-to-face and video interventions raise patients' awareness to the same extent.

Table 3. Comparison of mean difference of patients' knowledge scores in two groups before and after educational intervention

Group	Mean	SD	P value
Face to face education	10.56	4.7	0.97
Video training	10.41	4.73	

Discussion

In this study, the knowledge of 68 patients requesting bone marrow transplantation (34 in face-to-face education and 34 in video training) was evaluated. The mean knowledge score in the face-to-face and video groups significantly increased after the intervention. However, there was no significant difference between the two groups. Increasing awareness among patients requesting bone

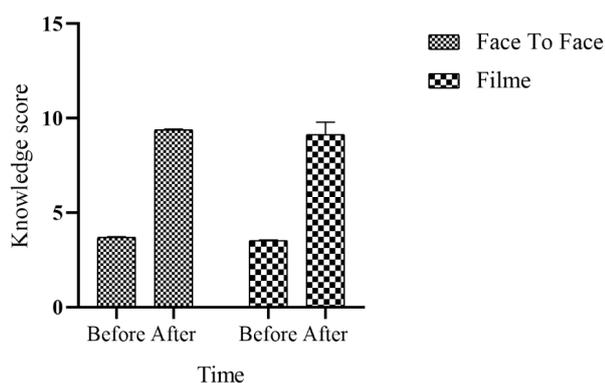


Figure 1. The mean and standard deviation of knowledge scores in face-to-face and video groups before and after intervention

marrow transplantation about preoperative conditions and postoperative care is crucial for reducing their stress and anxiety. Proper training can positively impact the training process. Although face-to-face education is often a priority for healthcare providers and patients, the findings of this study indicate that face-to-face education and video training were equally effective in increasing the knowledge of patients requesting bone marrow transplantation. Rajabi Naeeni et al showed that multimedia software and face-to-face education had an equal effect on increasing pregnant women's awareness of prenatal and postnatal risk factors and common causes of death (15). In another study, although positive effects of face-to-face education were observed, the attitude of hemodialysis patients toward face-to-face education was not significantly different from their attitude toward video training (24). Noorian et al found that preoperative patient education through face-to-face and pamphlet methods was equally effective in increasing patient knowledge (25). While the increase in the patient's level of awareness from 3 to 9 may seem small, it significantly affects feelings of relaxation and reduces anxiety. This increase has a notable impact on the treatment process for both doctors and nurses. Although its effect may not be high, its clinical and behavioral effects are substantial.

Contrary to the results of the present study, which found no difference between the two teaching methods, some similar studies have indicated that multimedia teaching is more effective. For example, the results of the Campbell and colleagues' study showed that people trained with the help of CDs had higher self-efficacy and greater awareness of low-fat diet consumption compared to the control group (26). Keulers and colleagues' study on patients with carpal tunnel syndrome in the Netherlands found that those trained with computer software had higher levels of knowledge than those who received face-to-face education (21). In Mahler and Kulik's study, patients who watched video programs felt significantly better informed, gained more information, were better prepared for recovery, and had higher self-efficacy beliefs than those in the control group (27). According to Motevally et al, video training

alone is more effective in changing attitudes and learning than methods such as lectures, self-instruction, and group discussions, illustrating the effective role of video as a medium in learning and forging positive attitudes (28). In Heikkinen and colleagues' study, while face-to-face education increased patients' knowledge, online education had a greater impact on enhancing their knowledge levels (29). Abbaszadeh et al found in their study that video training was more effective because educational videos, by showing real images, are a valuable tool for illustrating the importance of the disease and its impact on health, thus promoting patients' awareness and understanding of the disease and care procedures. They suggested that face-to-face education might not fully convey or help people retain information, a disadvantage that video training can address to some extent (30). These results suggest that with the advent of computers and the development of information and communication technology, video training can enhance knowledge and attitudes across various fields and reduce the need for in-person instruction. Khademian et al demonstrated the positive effects of face-to-face education in their study, noting that this method allows for greater interaction between the educator and the learner. It also facilitates tailored education based on individual patient needs, responding patients' questions, solves their problems, and ensures effective communication (31). However, according to the results of the present and similar studies, neither teaching method can be preferred over the other.

In the present study, both face-to-face education and video training methods significantly increased the patients' knowledge, highlighting the importance of patient education. Rajabi Naeeni et al found that both face-to-face education and multimedia software training methods had a significant effect on promoting pregnant women's awareness (15). Abbaszadeh and colleagues' study showed that video training, within the framework of the health belief model, led to increased knowledge and improved attitudes among patients. Moreover, patients' knowledge was significantly enhanced after the educational intervention (30). The Australian study by Jimenez et al demonstrated that video training significantly increased the level of knowledge among breast cancer patients undergoing radiation therapy (32). Having sufficient knowledge about the disease and its risk factors can help correct and control some of the risk factors. Designing educational interventions using different educational methods, such as face-to-face education, can improve patients' beliefs and attitudes toward illness, treatment, and post-illness conditions.

Research Limitations

One limitation of the study was that individuals who had previously undergone a bone marrow transplant were already familiar with the disease, transplantation, and

treatment conditions. Another limitation was that no control group (without intervention) was included in this research due to the time constraints and the difficulty of accessing the sample. Future researchers are encouraged to include a control group to obtain more accurate results.

Conclusion

This study showed that the mean knowledge score in the face-to-face and video groups significantly increased after the intervention. However, no significant difference was observed between the two groups. It is recommended to conduct similar studies to compare the effectiveness of these two training methods over longer periods. The mean age of patients in both groups was over 50 years. Changes in cognition and multiple senses in older individuals can affect their learning. For example, impaired vision and hearing can lead to difficulties in reading and hearing. Therefore, it is important to consider the limitations of educational methods for this age group. In addition, providing opportunities for family members to attend training sessions may be beneficial. Awareness alone is a poor predictor of health measures; however, without sufficient awareness, society cannot be expected to make informed decisions about their health or modify health behaviors. Therefore, it is recommended to evaluate the effect of these educational methods on other outcomes related to patients, such as stress reduction, satisfaction with care, and treatment follow-up. Moreover, since patients often lack sufficient information about self-care, it is necessary to investigate the reasons for non-implementation of patient education and to focus more on nursing management.

Authors' Contribution

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Project administration: Farokh Abazari, Mansooreh Azizzadeh Forouzi, Mahlagha Dehghan and Sedigheh Sadat Mousavi.

Resources: Sedigheh Sadat Mousavi.

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Writing—original draft: Fatemeh Karami Robati.

Writing—review & editing: Sedigheh Sadat Mousavi.

Competing Interests

The authors of this study have no conflict of interest.

Ethical Approval

This study was approved by the ethics committee of Kerman University of Medical Sciences in Iran (ethical code: IR.KMU.REC.1397.160).

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