Original Article

The Effect of Web-Based Training on Anxiety and Depression Levels in Myocardial Infarction Patients

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Abstract

Background: This study was designed as a randomized experimental study to determine the effect of web-based training on anxiety and depression levels in patients who previously underwent myocardial infarction (MI).
Methodology: The study was carried out between January and December 2016 with individuals who applied to two hospitals affiliated to the Ministry of Health because of MI. 65 individuals were randomly assigned to the experimental group and the control group separately. Data were collected with Patient Information Form and Hospital Anxiety Depression Scale and Patient Follow-up Form. While patients in the control group received routine patient notification, a web-based distance education program was applied to the experimental group. Both groups were reevaluated after 3 months.
Results: The attitude of the individuals included in the study to exhibit health behaviors, and thus their compliance to treatment, was significantly higher in the experimental group compared to the control group ($P < 0.001$). The mean anxiety and depression scores of the experimental group were 6.74 ± 3.36 and 6.26 ± 3.16, whereas the mean scores of the control group were 9.66 ± 3.85 and 9.28 ± 3.49, respectively. A significant difference was found between the groups ($P < 0.001$). Similarly, 20% and 52.3% of the experimental group and 49.2% and 81.5% of the control group had anxiety and depression scores above the threshold, respectively.
Conclusion: Web-based remote training is effective in decreasing the anxiety and depression levels in individuals who previously underwent MI. Web-based remote training can be recommended as an effective training method in dealing with life-threatening situations.

Keywords: Myocardial infarction, patient training, web-based remote training, compliance to treatment, health behavior.

Introduction

Myocardial infarction (MI) has the highest incidence and mortality rate among cardio vascular diseases. Mortality is mostly seen within the first 3 months after discharge and it decreases with the reduction of risk factors as a result of appropriate health behaviors and success of compliance to the disease and treatment (Sol et al., 2011; Uysal, 2011; Steg et al., 2012). The only way to ensure change in behavior and compliance to treatment is to raise awareness and educate the individual (Brink, 2009; Uysal, 2011; Sol et al., 2011; Steg et al., 2012; Cayir, 2013).

After MI, Individuals are faced with experienced pain, fatigue symptoms, fear of relapse and death, anxiety, depression, and the stress of not being able to manage treatment and care after discharge. Stress, anxiety, and depression are among the changeable risk factors of MI, but they may adversely affect the individual's

compliance to disease and treatment after discharge. Therefore, studies have shown that two-thirds of discharged patients suffer from post-traumatic stress syndrome for 2 years (Uysal, 2011; ESC, 2013; Tully, 2016).

In the literature, it is emphasized that with the help of post-MI training and counseling, the awareness of the individual is increased, healing is accelerated, and re-hospitalization and stress levels are reduced (Munro et al., 2013; Fontaine et al., 2016; Dressler and Lewin, 2013).

Although face to face interviews individually or in groups, demonstration and written materials are the most frequently used methods in patient education, the developments in information and communication technologies in recent years have also changed the expectations in education (Devi, 2015; Senyuva and Tasocak, 2007). Interactive web-based training, which provides the opportunity to reach many people at the same time independent of time and place, where different education methods are used together, emerges as a new training method in patient education today (Devi et al., 2014; Dogu et al., 2015; Yenal, 2006).

In this context, the aim of this study was to determine the effect of web-based remote training on anxiety and depression levels in patients who underwent myocardial infarction.

Methodology

Design and sample

This study was designed as a randomized experimental research. Study population consisted of individuals who applied to two hospitals affiliated to the Ministry of Health due to MI between January and December 2016. Power analysis was made to determine sample size, and group size for the experimental and control groups were calculated as 65 individuals with a Type I error (α) of 0.05 and a Type II error (β) of 0.20. A total of 130 individuals were included in the study. Patients included in the study were randomly assigned to the experimental and control groups.

Data Collection Tools:

Data were collected by Patient Information Form and Hospital Anxiety Depression (HAD) Scale.

Patient Information Form was prepared by the researcher according to the literature and consisted of questions on demographic characteristics (4 questions, gender, etc.) and health behaviors (7 questions, diet, activity, etc.) of the individual.

Hospital Anxiety and Depression Scale (HAD) was developed by Zigmond and Snaith. Its Turkish validity and reliability study was conducted by Aydemir et al. The scale consists of 14 items, 7 of which are on depression (even numbers) and 7 on anxiety (odd numbers), and two sub-dimensions. The cutoff value for the anxiety sub-dimension is 10, and the cutoff value for the depression sub-dimension is 7. Mean scores are interpreted according to these cutoff values. Accordingly, patients with scores above these cutoff values are considered to be at risk (Aydemir and Guvenir 1997; Aydemir et al. 2015).

Data Collection

A web-based remote training program covering seven topics was prepared by the researchers in accordance with the current literature. In accordance with the life model, this program included information about the structure of the heart, myocardial infarction, risk factors, and information which may be needed by the individual during daily life activities such as nutrition, physical activity, etc. (AACVPR, 2013; ESC, 2013; Roper et al., 2000). Expert opinions were received for the program content.

After collecting all data before discharge, routine verbal information was given to the individuals in the control group, and the date for the 3rd month examination was scheduled so data of the second follow-up could be collected.

Individuals in the experimental group were informed about the web-based remote training program on the day they were discharged. http://www.kalp.sakarya.edu.tr/ IP address was placed on the web pages of the hospitals to facilitate access of individuals. In the experimental group, all the data of the first follow-up was collected similar to the control group, and the date for the 3rd month examination was scheduled. Three months after discharge, data were re-collected from the experimental and control groups via HAD during the outpatient clinic follow-up.

Research Ethics

Before starting the study, written approval was obtained from the relevant institutions and ethics committee (29.05.2015-6710). Individuals

included in the study were informed about the purpose and duration of the research and what was expected of them, and informed consent was obtained from participants based on the principles of willingness and volunteerism.

Data Analysis

The findings of the study were evaluated by IBM SPSS Statistics 22 program. Numerical variables were examined with Kolmogorow-Smirnov Normality Test and it was found that they were not normally distributed (P = 0.000). Number, percentage, mean, and standard deviation were used to express data. Mann Whitney U test was used to compare two independent groups, Cronbach's alpha was used for reliability, and the difference between two independent categorical variables was examined by Chi-square analysis. In addition, effect sizes were calculated using Cohen's formula (Cohen, 1988). P < 0.05 was considered statistically significant.

Study Limitations

Study population consisted of two hospitals in the city center of Sakarya. Therefore these study results cannot be generalized.

Results

The mean age of the control group was 54.78. 75.4% of the participants in the control group were male, 87.7% were married and 53.8% were primary school graduates. The mean age of the experimental group was 53.85. 83.1% of the participants in the control group were male, 96.9% were married and 38.5% were primary school graduates. According to the results of the comparative analysis, there was no statistically significant difference between the experimental and control groups and the groups were homogeneously distributed (P > 0.05) (Table 1).

According to the Patient Follow-up Form which was applied in the policlinic control after 3 months, 61.5% of the patients in the control group stated that they used their medicines regularly, 55.4% stated that they did not make any changes in their medications without consulting their physician, 53.8% stated that they exercised regularly for 30 min a day, 56.9% stated that they did not include fried food and pastries in their diet, 60.0% stated that they consumed at least 1.5-2 liters of liquid daily, and 58.5% stated that they partially reduced their salt intake.

95.4% of the patients in the experimental group stated that they used their medicines regularly, 64.6% stated that they did not make any changes in their medications without consulting their physician, 81.5% stated that they exercised regularly for 30 min a day, 41.5% stated that they did not include fried food and pastries in their diet, 41.5% stated that they partially included fried food and pastries in their diet, 89.2% stated that they consumed at least 1.5-2 liters of liquid daily, and 86.2% stated that they reduced their salt intake. Comparative analysis showed that the percentage of individuals with regular compliance to treatment was significantly higher in the experimental group compared to the control group (Table 2) (P < 0.05).

The mean anxiety and depression scores of the participants in the experimental and control groups are presented in Table 3. 20% of the participants in the experimental group had an anxiety score above the cutoff value, whereas this ratio was 49.2% in the control group. While 52.3% of the participants in the experimental group had a depression score above the cutoff value, this rate was found to be 81.5% in the control group. Mean anxiety and depression scores were significantly different between the experimental and control groups (Table 3) [MU = 1202,000, P <0.001, d = 0.86], [MU = 1082,000, P <0.001, d = 0.90].

In order to determine whether the difference was important, effect size was calculated based on Cohen's d value (standardized mean difference) for the difference between the mean values of two events or groups. According to this result (Cohen d = 0.86; d = 0.90), the difference between the two dimensions is important (large effect size), and the lower mean HAD scores in the experimental group are statistically significant (Cohen, 1988).

Table I: Socio-demographic characteristics of individuals

		Control Group (n=65)		Experimental Group (n=65)		Total (N=130)		χ^2	p
		n	%	N	%	N	%		
Age	24-39	6	9.2	3	4,6	9	6.9	3.443**	0.176
	40-55	26	40.0	36	55.4	62	47.7		
	56+	33	50.8	26	40.0	59	45.4		
	$\overline{X} \pm SD$ (Min-Max)	54.78±12.797 (24-80)		53.85±8.635 (35-80)		54.32±10.884 (24-80)		t=0.490* p=0.625	
Gender	Female	16	24.6	11	16.9	27	20.8	1.169**	0.280
	Male	49	75.4	54	83.1	103	79.2		
Marital Status	Married	57	87.7	62	96.9	119	92.2	4.153**	0.188
	Single	8	12.3	2	3.1	10	7.8		
Educational Status	Primary School	35	53.8	25	38.5	60	46.2	5.513**	0.138
	Middle School	8	12.3	18	27.7	26	20.0		
	High School	14	21.5	14	21.5	28	21.5		
	University	8	12.3	8	12.3	16	12.3		

p>0.05 *t= Independent Samples T test ** x^2= Chi-square

Table II. Comparison of Control and Experimental Group According to Patient Follow-up Form

	Control Group (n=65)		Experimental Group (n=65)		Total (N=130)		χ^2	p
	N	%	N	%	N	%		
Do you take your medicines regularly?								
Yes	40	61.5	62	95.4	102	78.5		
No	0	0.0	1	1.5	1	0.8	25.338	**0.000**
Partially	25	38.5	2	3.1	27	20.8		
Do you change your medication without consulting your physician?								
Yes	4	6.2	6	9.2	10	7.7		
No	36	55.4	42	64.6	78	60.0	2.385	0.303
Partially	25	38.5	17	26.2	42	32.3		
Do you exercise regularly for 30 minutes a day?								
Yes	27	41.5	53	81.5	80	61.5		
No	3	4.6	0	0.0	3	2.3	22.705	**0.000**
Partially	35	53.8	12	18.5	47	36.2		
Do you include fried food and pastries in your diet?								
Yes	5	7.7	11	16.9	16	12.3		
No	23	35.4	27	41.5	50	38.5	4.133	0.127
Partially	37	56.9	27	41.5	64	49.2		
Do you pay attention to eat boiled or oven-baked food?								
Yes	29	44.6	59	90.8	88	67.7		
No	2	3.1	0	0.0	2	1.5	31.827	**0.000**
Partially	34	52.3	6	9.2	40	30.8		
Do you consume at least 1.5-2 liters of fluid per day?								
Yes	24	36.9	58	89.2	82	63.1		
No	2	3.1	1	1.5	3	2.3	38.631	**0.000**
Partially	39	60.0	6	9.2	45	34.6		
Have you reduced your daily salt intake?								
Yes	27	41.5	56	86.2	83	63.8		
No	0	0.0	0	0.0	0	0.0	Fisher	**0.000**
Partially	38	58.5	9	13.8	47	36.2		

p>0.05 x^2= Chi-square

Table III. Mean HAD Scores of the Experimental and Control Groups

	Total (n:130)	Control (n:65)	Experimental (n:65)	MU; p
HAD-A Score	8.30±3.92	9.86±3.85	6.74±3.36	*1202.000; ** **0.00**
Anxiety n/%	45/34.6	32/49.2	13/20.0	
HAD-D Score	7.76±3.64	9.28±3.49	6.26±3.16	1082.000; ****0.000**
Depression n/%	87/66.9	53/81.5	34/52.3	

HAD-A: Hospital Anxiety Depression Scales Anxiety score; HAD-D: Hospital Anxiety Depression Scales Depression score

* MU= Mann Whitney U test; **Cohen d: HAD-A 0.86; HAD-D0.90

Discussion

Web-based education has brought a new dimension to patient education. Recent studies have reported that its use in chronic patient management has increased gradually, it supports individuals to manage their own treatment after discharge, and it has positive effects on secondary prevention, recovery, and stress management (Nguyen et al., 2004; Yenal, 2006; Eysenbach, 2011; Devi, 2014; Dogu et al., 2015; Fontaine et al., 2016).

In our study, we tried to evaluate treatment management via patient education after discharge in terms of safe medication use, proper nutrition and physical activity. It was observed that the rate of performing the expected health behaviors was higher in the experimental group compared to the control group, and there was a significant difference between the groups (Table 2) ($P < 0.001$).

The positive impact of web-based training has been emphasized in many studies (Zutz et al., 2007; Vernooij et al, 2012; Munro et al., 2013; Devi, 2014; Antypas and Wangberg, 2014; Lear et al., 2014; Devi, 2015). Nguyen et al. (2004) showed that web-based patient education provided online had a positive effect on individuals managing their health, and emphasized its significant contributions in reaching individual patients and developing adequate health behaviors especially in health institutions providing healthcare services to an increasing number of patients and increasing chronic diseases. Similarly, Fontaine et al. (2016), emphasized that individuals discharged after MI can be preferred primarily for creating evidence-based behavioral changes and providing an interactive educational environment.

Changing life habits and treatment management can be the main stress factor in MI patients after discharge and stress, anxiety, and depression are among the changeable risk factors of MI. In order to evaluate the emotional status of the individuals in the experimental and control groups, mean HAD scores were examined. Control group had a mean HAD-A score of 9.86 ± 3.85, which was close to the cutoff value, and the experimental group had a mean HAD-A score of 6.74 ± 3.36, which was at a good level. Similarly, mean HAD-D score was 9.28 ± 3.49 in the control group and above the cutoff value, whereas it was 6.26 ± 3.16 in the experimental group and below the cutoff value. There was a

significant difference between mean HADS scores of the groups (Table 3) ($P < 0.001$).

In his study on MI patients, Çiftçi stated that training activities for stress management should be organized after MI to cope with stress in order to prevent recurrence of MI and contribute to treatment. In this respect, the impact of web-based training cannot be overlooked. Studies have reported that web-based education, which is a special training page where individuals can interact and enter with their unique password, has positive effects on achieving secondary prevention and recovery in patients, self-care management, and stress management (Eysenbach, 2011; Devi, 2014; Dogu et al., 2015; Fontaine et al., 2016).

Similar to our study, Younge et al. (2015) followed two groups of cardiac patients who were treated with training manuals and web-based training for 3 months, and stated that these could be used in addition to treatment at discharge.

Conclusion and Recommendations

It was determined that web-based remote training had a positive impact on emotional status and compliance to treatment which could be affected from treatment management and the stress experienced by MI patients. Web-based training can be recommended as an alternative to education, especially in chronic diseases.

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