The Effects of an Educational Program on Beliefs and Relaxation Behaviors of Patients with Chronic Low Back Pain Referred to Pain Clinics: An Experimental Study

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Abstract

Background: False beliefs and fear of movement are common among patients with chronic low back pain (CLBP).

Objectives: The current study aimed at changing the relaxation behaviors (RB) of patients with chronic low back pain based on educational programs through the Theory of Reasoned Action.

Methods: The current experimental study was conducted from May to Nov 2016 on patients with chronic low back pain referred to pain clinics in Yazd, Iran. Through random blocking of every two participants, two groups were formed; the intervention (N = 43) group received educational programs based on the theory of reasoned action plus physician visits, and the control group (N = 45) received just physician visits.

Results: The mean age of intervention and control groups was 40.14 ± 6.8 and 38.33 ± 5.46 years, respectively. The mean score of RB in the intervention group improved from 4.58 ± 1.73 at baseline to 4.51 ± 1.69 and 3.02 ± 1.64 at three- and six-month follow-up times, while in the control group the changes were from 2.84 ± 1.62 at baseline to 3.49 ± 1.16 and 3.20 ± 1.42 at the same follow-up times; the changes were significant (P = 0.04).

Conclusions: The educational programs of the current study could be recommended to change the beliefs of patients with chronic low back pain about the relaxation behaviors.

Keywords: Behavior, Belief, Chronic, Education, Low Back Pain, Program, Reasoned Action, Relaxation, Theory

1. Background

Low back pain (LBP) is a common health problem experienced by most people in a point of life (1, 2). The disability due to chronic low back pain (CLBP) may be deteriorated by psychosocial factors (1). Work absenteeism, poor social activities, lack of mental and general health, depression and anxiety happen due to CLBP disability (3). However, depression could lead to CLBP and disability (4), and spiritual practices could manage pain (5). Pincus et al. revealed that both depression and somatization were positively associated with CLBP (4). The association between somatization, depression, and CLBP was verified (6).

Negative beliefs such as disabling thoughts and fear of movement are strong predictors of pain and depression among patients with CLBP that could lead to disability, reduced mental health, and depression (7). Furthermore, pain catastrophizing, pain-related fear avoidance, and mindfulness could significantly predict the pain severity and anxiety (8).

Relaxation behavior (RB) is one of the approaches that could encounter negative beliefs in patients with CLBP (9, 10). New therapeutic interventions focus on coping strategies such as distraction, relaxation, and acceptance (11). Evidence recommends that education programs should focus on improving the beliefs of the CLBP patients (12). Patient education provides the information to change patients' cognition about the chronic state through the reduction of fear of movements (13). However, many healthcare providers are unaware of the negative beliefs of patients with CLBP (14). Patients with CLBP are more likely to do RB, while they observe the other patients do such behaviors (15).

The theory of reasoned action (TRA) illustrates the predictors of behavioral intention and also behaviors (16, 17). Key concepts of the TRA are shown in Figure 1. According to this theory, the beliefs of the patients and beliefs of the referent people play essential roles in doing healthy behaviors. The current study aimed at assessing the effectiveness

of an educational program based on TRA on changing beliefs and relaxation behaviors of patients with CLBP.

2. Methods

2.1. Subjects Sampling

The current experimental study was conducted from May to Nov 2016, on patients with CLBP referred to two private pain clinics in Yazd, Iran. These clinics are referral centers, geographically located near the city center, and the people living in all areas of the city with different sociodemographic characteristics refer there. For sample selection, first, the referred patients with CLBP were recruited based on inclusion/exclusion criteria. Inclusion criteria were mechanical CLBP, age $\geq$ 25 years, female gender, the ability to read/ write/ understand Farsi language, and willingness to participate in the study. Exclusion criteria were vertebral fracture/surgery on the spine, inflammatory back pain, tumor or congenital abnormalities in the spine, severe mental disorder, substance abuse, pregnancy, age $\geq$ 65 years, and any health conditions that prevent participation in educational programs. All the recruited patients were visited by the same orthopedics to confirm the diagnosis and were divided into the control or intervention group through random blocking of every two participants. The orthopedist and the person responsible for randomization were blinded to the allocation sequence. The procedure and objectives of the study were explained to the participants, and the name and characteristics of the patients were kept confidential. Informed consent was obtained from each patient. The participants in both groups were evaluated every two months by the physician that made the initial assessment, but the patients could also see the physician earlier on request. Throughout the study, medications such as analgesics, nonsteroidal anti-inflammatory drugs (NSAIDs), and antidepressant drugs were prescribed for participants in the two groups if necessary.

The study protocol was in accordance with the ethical guidelines of the 1975 Declaration of Helsinki. The current study was also approved by the Ethics Committee of Tarbiat Modares University prior to conduction (TMUEC96/03/25).

2.2. Sample Size

Totally, 215 patients were visited by the physician, of which 90 eligible patients were selected and divided into two groups of intervention (N = 45) and control (N = 45). Figure 2 shows participants' assignment and follow-ups using CONSORT guidelines (18). The sample size calculation was based on the following formula in which $\bar{X}_1$ = 43.6, S_1 = 18.5, $\bar{X}_2$ = 26.2, S_2 = 21.9, (1-B = 80%) and (1-a = 99%) were considered.

$$n = \frac{\left(S_1{}^2 + S_2{}^2\right)\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2}{\left(\bar{X}_1 - \bar{X}_2\right)^2}$$

$$n = \frac{\left(18.5^2 + 21.9^2\right)\left(2.326 + 0.86\right)^2}{\left(43.6 - 26.2\right)^2} = 27.55$$

The sample size (n = 28) with 20% dropout was 33 individuals. To increase the power of the study, 45 patients with CLBP were considered in each group.

2.3. Intervention

Before conducting the current study, through a cross-sectional study, the predictors of RB were determined by linear regression analysis (19). According to this study (19), the constructs of TRA such as behavioral belief, normative belief, and motivation to comply were determined as predictors of RB. Therefore, the intervention program was designed based on these predictors as follows:

In the first 45-minute session, doing RB was educated and practiced; relaxing all parts of the body, removing confused thinking, and reviewing relaxation ways were focused here.

In the second 45-minute session, the negative thoughts and beliefs of the participants about RB were considered. Here, the participants tried to reduce their pain through positive beliefs about RB.

In the third 45-minute session, the researcher tried to improve the participants' beliefs about certain people and showed them the films in which the physicians, health care providers, and other patients with CLBP recommended RB.

In the forth 45-minute session, the participants were motivated to comply with the referral of individuals such as physicians and health care providers. At the end of the sessions, all participants were provided with a CD and a small pamphlet including all items discussed in the sessions.

2.4. Questionnaire

A demographic questionnaire and a 14-item questionnaire based on TRA were used. An expert panel consisting of five experts in health education, two pain specialists, two general practitioners, and one health psychologist evaluated the questionnaire.

The anxiety and depression were assessed through the hospital with the anxiety and depression scale (HADS). This 14-item scale has seven items for anxiety and seven items for depression. The total score of HADS is 21 but in this study just the depression and anxiety questions were applied. The content validity ratio (CVR) and the content validity index (CVI) and reliability of HADS for Iranian population were confirmed previously (19-21).
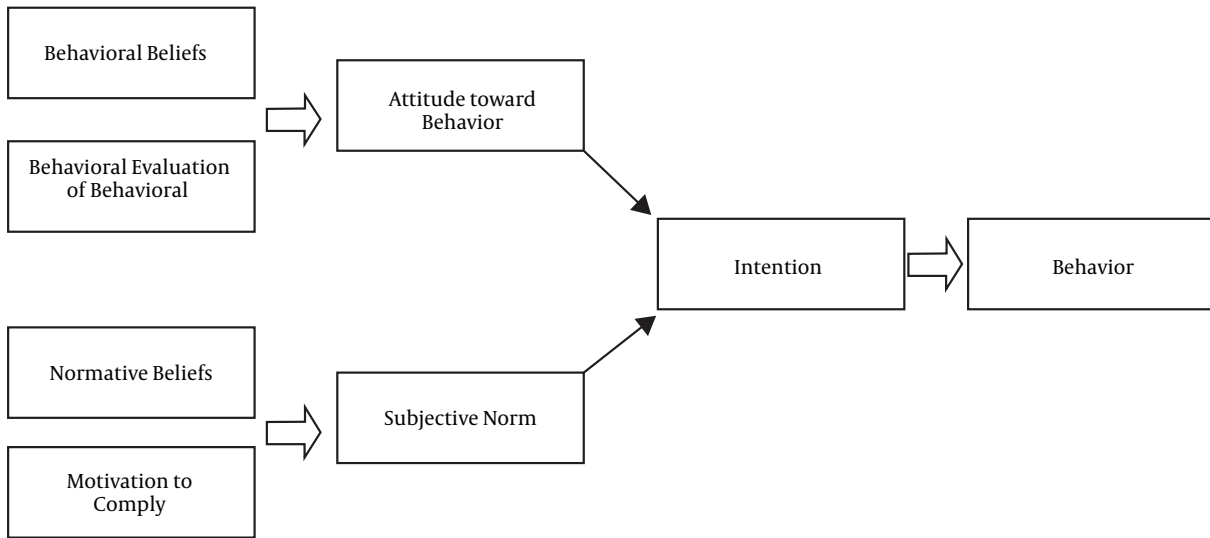
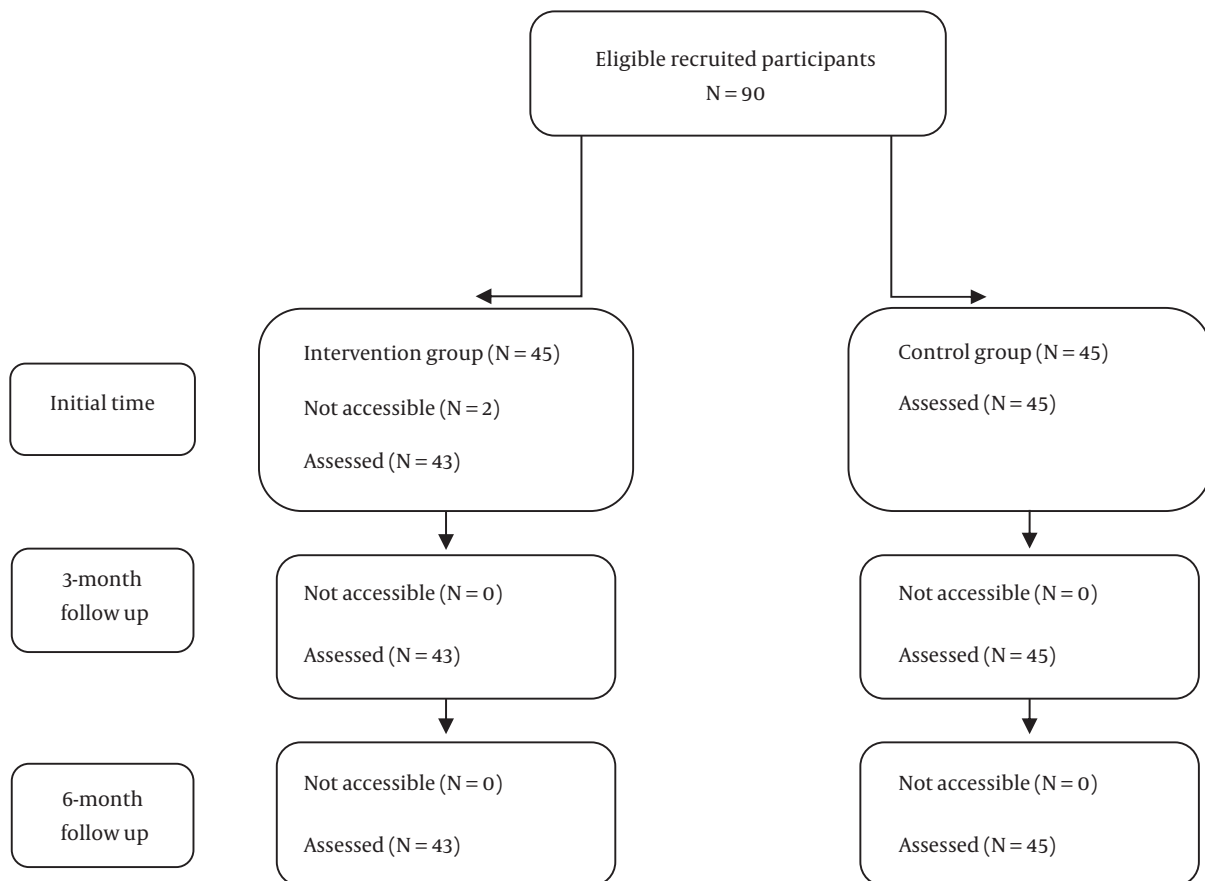**Figure 1.** Theory of reasoned action

Figure 2. The flowchart of patients' recruitment and allocation

2.5. Statistical Analysis

IBM SPSS Statistics Software for Windows, version 21.0 (IBM Corp., Armonk, N.Y., USA) was used to analyze data. The Shapiro-Wilk test showed the normal distribution of all data; therefore, parametric tests were used. To compare scores between groups over time, *t*-test and repeated measures ANOVA were performed. There were no considerable attrition and missing data. Therefore, there was no need to test intention-to-treat analysis.

3. Results

Totally, 88 patients with CLBP including 43 patients with the mean age of 40.14 ± 6.8 years in the intervention and 45 patients with the mean age of 38.33 ± 5.46 years in the control group were assessed. The basic and demographic characteristics such as occupational status, marital status, age, anxiety, depression, behavioral beliefs, behavioral evaluation, normative beliefs, motivation to comply, attitude and intention towards RB were compared between the two groups at the beginning of the study. Table 1 shows the results in these regards. Table 2 shows the distribution of the variables based on TRA constructs at three- time- points. Accordingly, in terms of all TRA constructs, there were significant differences between the two groups over time (P < 0.001). Furthermore, both groups were at different time points after intervention in terms of TRA variables (P < 0.001). There was no significant difference between the two groups over time in terms of anxiety (P = 0.18) and depression (P = 0.89). However, both groups were different significantly at three and six-month follow-ups in terms of anxiety and depression variables.

4. Discussion

In the current study, the researchers tried to change the beliefs of the participants about RB. There is evidence pointing to the positive effects of proper interventions on improving RB in order to reduce anxiety, and depression among patients with CLBP (21, 22). Although, the high incidence of anxiety in patients with CLBP is confirmed in different studies (23, 24), the current study verified that RB could reduce anxiety among such patients. The result was in line with those of previous studies (21-23). An Iranian study on cognitive, emotional, and behavioral dimensions of CLBP revealed that cognitive behavioral intervention could improve the negative beliefs of such patients (22). However, the evidence showed that cognitive behaviors were effective in pain reduction just for a short while (25).

Table 1. Demographic Characteristics of Both Groups at Baseline

Characteristics / Group	N	Mean	Std. Deviation	P Value
Marital status				0.47
Married				
Intervention	38			
Control	41			
Single				
Intervention	5			
Control	4			
Widow/Divorced				
Intervention	0			
Control	0			
Occupational status				0.42
Employed				
Intervention	20			
Control	19			
Housewife				
Intervention	23			
Control	26			
Age, y				0.17
Intervention	43	40.14	6.83	
Control	45	38.33	5.46	
Anxiety				0.95
Intervention	43	10.1628	2.83	
Control	45	10.0222	2.87	
Depression				0.84
Intervention	43	10.0698	2.56	
Control	45	10.2444	2.51	
Behavioral beliefs				0.63
Intervention	43	11.0233	2.54	
Control	45	10.2222	2.34	
Behavioral evaluation				0.98
Intervention	43	11.1395	1.71	
Control	45	10.1333	1.74	
Normative beliefs				0.64
Intervention	43	11.1163	1.69	
Control	45	10.4889	1.60	
Motivation to comply				0.10
Intervention	43	11.1163	1.62	
Control	45	10.6667	1.21	
Subjective norms				0.06
Intervention	43	62.4651	15.77	
Control	45	56.1556	11.54	
Attitude				0.22
Intervention	43	62.6279	20.61	
Control	45	51.9778	15.87	
Intention				0.52
Intervention	43	4.6512	1.31	
Control	45	4.5556	1.32	
Behavior				0.74
Intervention	43	6.1860	3.15	
Control	45	5.6444	2.99	

In the current study, the researchers tried to change the negative normative beliefs about RB. The previous studies claimed that when a person is faced with a health prob-

Table 2. Distribution of Variables in Both Groups Over Time

Variable/ Follow-Up	Intervention (N = 43)[a]	Control (N = 45)[a]	Time Dif. P Value	Group Dif. P Value	Time and Group Interaction P Value
Behavioral beliefs			0.001	0.008	0.001
At the beginning	11.02 ± 2.54	10.22 ± 2.34			
3-month, follow-up	12.19 ± 1.5	9.64 ± 1.42			
6-month follow-up	13.21 ± .94	11.07 ± 2.14			
Behavioral evaluation			0.001	0.001	0.013
At the beginning	11.14 ± 1.71	10.13 ± 1.74			
3-month follow-up	12.85 ± 1.44	10.40 ± 1.57			
6-month follow-up	12.93 ± 1.10	11.09 ± 1.82			
Normative beliefs			0.001	0.001	0.027
At the beginning	11.12 ± 1.69	10.49 ± 1.60			
3-month follow-up	12.70 ± 1.41	12.40 ± 1.53			
6-month follow-up	12.72 ± 1.12	11.95 ± 1.52			
Motivation to comply			0.001	0.001	0.005
At the beginning	11.12 ± 1.62	10.67 ± 1.21			
3-month follow-up	12.77 ± 1.60	10.00 ± 2.50			
6-month follow-up	13.09 ± 1.19	11.35 ± 1.52			
Subjective norms			0.001	0.001	0.004
At the beginning	62.46 ± 15.77	56.15 ± 11.54			
3-month follow-up	81.91 ± 17.20	60.91 ± 16.89			
6-month follow-up	83.54 ± 12.12	64.47 ± 15.36			
Attitude			0.001	0.033	0.037
At the beginning	62.63 ± 20.61	51.98 ± 15.87			
3-month follow-up	83.86 ± 15.73	71.62 ± 18.99			
6-month follow-up	85.67 ± 11.44	63.98 ± 17.85			
Intention			0.001	0.001	0.016
At the beginning	4.65 ± 1.31	4.55 ± 1.32			
3-month follow-up	6.30 ± .74	3.71 ± 1.21			
6-month follow-up	6.21 ± .63	5.20 ± 1.25			
Behavior			0.001	0.001	0.04
At the beginning	3.02 ± 1.64	2.84 ± 1.62			
3-month follow-up	4.58 ± 1.73	3.49 ± 1.16			
6-month follow-up	4.51 ± 1.69	3.20 ± 1.42			
Anxiety			0.001	0.033	0.18
At the beginning	10.16 ± 2.83	10.02 ± 2.87			
3-month follow-up	6.79 ± 2.32	8.00 ± 2.15			
6-month follow-up	8.02 ± 2.71	9.09 ± 3.24			
Depression			0.024	0.73	0.89
At the beginning	10.07 ± 2.56	10.24 ± 2.51			
3-month follow-up	9.00 ± 2.59	8.84 ± 2.44			
6-month follow-up	9.07 ± 2.68	9.35 ± 2.73			

[a] Data are expressed as mean ± SD.

lem such as CLBP, false beliefs such as disabling thoughts and fear of movement were formed (6). The other studies showed that among Iranian patients, the cognitive behavioral interventions, which tried to change the cognitions and beliefs of the patients were successful to control the stress and anxiety among the patients (23, 24).

Although the educational programs focusing on social and psychosocial causes of CLBP lead to improving beliefs and behaviors of patients with CLBP (12), many healthcare providers are unaware of negative beliefs of patients with CLBP (14).

In the current study, subjects in the intervention group were motivated to comply with the certain people who had positive beliefs about RB. The existing evidence showed that motivating the patients with CLBP to move were successful, while they observed that the certain people do that behavior (15).

In the current study, the RB of the patients in the intervention group changed due to improving the negative beliefs that was a kind of novelty of the current study. In line with this result, the existing evidence also verified that continuous interventions led to modifying behavioral beliefs followed by the healthy behavior (22). In the current study, the researchers tried to clarify the positive outcomes of RB and also made the participants evaluate the outcome by themselves. The benefits of the cognitive-behavioral intervention to reduce pain and disability among patients with CLBP were verified (26). The perspectives of Iranian patients with CLBP toward their beliefs due to pain were discussed somewhere else (27, 28). However, some studies recommended that further researches be conducted to investigate the long-term benefits and risks of such interventions on patients with CLBP (25).

There were some limitations that should be considered. The first limitation is the employment of self-report data gathering method that might cause bias in the results. However, despite this limitation, the findings of the current study were supported by other studies. Although the obtained significant differences between the two groups were in line with those of other studies, significant effects of the educational programs on anxiety and depression were not confirmed that might be due to small sample size. In the current study, the factors such as body mass index (BMI) and the history of some diseases that might affect RB were not assessed. Although in the exclusions criteria, the patients with these histories were excluded from the study, it is suggested that in the future studies these variables be assessed.

4.1. Conclusion

The educational programs of the current study could be implemented to change the beliefs of patients with chronic low back pain in order to promote relaxation behavior in them. However, further multicenter studies with larger samples can confirm the results.

Footnotes

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