CIÊNCIAS DA SAÚDE / HEALTH SCIENCES

Applying the Theory of Reasoned Action on the promotion of behaviors related to physical activity in chronic back pain patients

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ABSTRACT. Patient's health with cLBP have a unique place in health policy. This study aimed to evaluate the effect of an educational program based on the TRA on promoting PA - related behavior. The (Reasoned Action theory-based back care) RAT-BAC was a Health Service Center-based RCT comparing the effectiveness of TRA construct. A total of 80 patients who referred to the SBUMS in Tehran, Iran were randomized to a TRA-based intervention group (n=40) and control group (n=40). cLBP completed a self-reported questionnaire at follow-ups; a check list was also used to evaluate the Range of motion of the lumbar spine test skills (LSTS) with modified Schober. The effects investigated the usage of repeated measure analysis Test and analyzed using SPSS 21. There was a significant interaction among the factors "group" and "test time" ($p < 0.001$), totally, 77 cLBP patients with mean age of (41.04 ± 4.23) in intervention (n=40) and control n=37 an age of (39.03 ± 3.48) in the control group were assessed. At baseline, both groups were identified concerning the TRA constructs ($p > 0.05$). Following the intervention, there was a significant difference in the course of 3, 6- month follow up ($p<0.001$). The mean score of PA behavior (8.38 ± 1.05) was significantly better than the control group (3.23 ± 1.04) ($p<0.001$). The pain severity (3.75 ± 2.24) was significantly less than the control group (4.28 ± 3.02) ($p<0.001$). The LSTS reduced within the intervention group ($p <0.05$). It demonstrated promise in improving PA-related behavior in Patients with cLBP, using a range of specific change educational strategies.

Keywords: health behavior; low back pain; health services; physical activity; educational intervention; theory of reasoned action.

Introduction

What do we already know about this topic?

Chronic pain is one of the most common reasons that adults are seeking out medical care. Low back pain is the leading cause of years lived with disability globally. On the other hand, having lower physical activity levels increases LBP-related disability.

How does your research contribute to the field?

This program targets physical activity-related behavior with elevated improving intention, attitude, subjective norms, normative beliefs, and Evaluation outcome behavior among cLBP patients, therefore to cognitive, behavioral, and psychological factors that can contribute to the experience of pain in patients with cLBP.

What are your research's implications towards theory, practice, or policy?

The evaluation regarding PA and normative beliefs behavior could affect the intention to engage in PA has been shown to be effective. Patients who had a positive belief in the consequences of PA behavior in terms of attitudes and Subjective norms, respectively, were more likely to do PA behavior so. Thus, the use of TRA theory-based interventions should be implemented nationwide.

Pain is a major cause of disability in the world's population. Disability is a central issue in Low Back Pain (LBP), affecting physical performance and consequently work productivity(Antunes et al., 2013). According

to the World Health Organization (WHO), Chronic Low Back Pain (cLBP) is one of the major 7 musculoskeletal problems seen(Demirel, Oz, & Ulger, 2019).

cLBP is determined through a complicated interaction among pain, behavior and biopsychosocial factors(Delshad, Hidarnia, & Pourhaji, 2022).The chronic non-specific low back is the most commonplace musculoskeletal criticism that significantly affects the overall population (Waseem, Karimi, Gilani, & Hassan, 2019). LBP is described as pain, muscle tension, or stiffness localized underneath the costal margin and above the inferior gluteal folds, without or with leg pain (sciatica), and is described as chronic when it persists for 12 weeks or more (Chou, 2010).incidence of cLBP global is expected at 19.6% in the ones aged between 20 and 59 years(Meucci, Fassa, & Faria, 2015).

Studying the distribution and determinants of cLBP pain permits us to apprehend and control the problem at the person and populace levels(Mills, Nicolson, & Smith, 2019).focused and suitable prevention educational strategies need to don't forget the biological, psychological, socio-demographic, and lifestyle determinants and results of pain (Mills et al., 2019). There are several treatment procedures to improve cLBP programs to be more effective than others support to change behavior(Gardner et al., 2019). Physical activities are encouraged as the principal part of treatment for cLBP pain(Waseem et al., 2019).Educational interventions are   useful for lowering Musculoskeletal Disorders (MSDs) costs thru promoting education(Delshad, Tavafian, & Kazemnejad, 2019a).

Theory of Reasoned Action (TRA) is one model via which health behavior predicting factors like intentions and others (Delshad, Tavafian, & Kazemnejad, 2019b). Ajzen et al (1980) believed that individuals consider the implications of their movements before deciding to engage or disengage in any given behavior (Al-Suqri & Al-Kharusi, 2015). This Theory checks that healthy behaviors will be predicted by the subjective norm (Al-Suqri & Al-Kharusi, 2015). Research has substantiated that TRA is an attitudinal model for understanding the main determinants of health behaviors(Chang, 1998).

Consequently, this study aimed to investigate the consequences of a designed interventional program based on TRA on promoting Physical Activity (PA) behavior amongst cLBP patients referred to comprehensive health service centers. The hypothesis was that the system could be effective to increase stretching exercise through improving TRA - based predictors and decrease MSDs amongst cLBP patients.

Material and methods

Trial design

This was a parallel randomized controlled trial (RCT) that was finished in Tehran, Iran.

Participants

This RCT study was performed on 80 cLBP patients referred to comprehensive health service centers in the Shargh and Shemiranat districts of Tehran and affiliated to Shahid Beheshti University of Medical Sciences (SBUMS) in Tehran, Iran. August 2019 - Feb 2020. These centers are, geographically located inside the town, and the humans dwelling in all areas of the metropolis with distinctive sociodemographic characteristics refer there; universal to participate in the observation voluntarily, and were able to attend education sessions. Inclusion criteria were as have at least reading/writing capability in Persian language /Patients with chronic low back pain for at least 12 weeks/ having mental health. Excluding criteria were as Patients who are mentally retarded/ patients with a history of surgery, patients with acute or proprioceptive low back pain/ fracture and inflammation in their spine/ patients suffering from congenital tumors or congenital anomalies, rheumatoid diseases and constriction history in the spine/ Psychological Problems/ Pregnancy/ Infection/ Depression. Figure 1 shows the complete procedure of sampling. Figure 2 shows Flowchart of Chronic Low Back Pain of the Patients recruitment, randomization and follow-up.

$$n = \frac{\left(s_1^2 + s_2^2\right)\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2}{\left(\overline{x}_1 - \overline{x}_2\right)^2}$$

$$n = \frac{\left(1.69^2 + 1.42^2\right)\left(1.96 + 0.85\right)^2}{\left(4.51 - 3.43\right)^2}$$
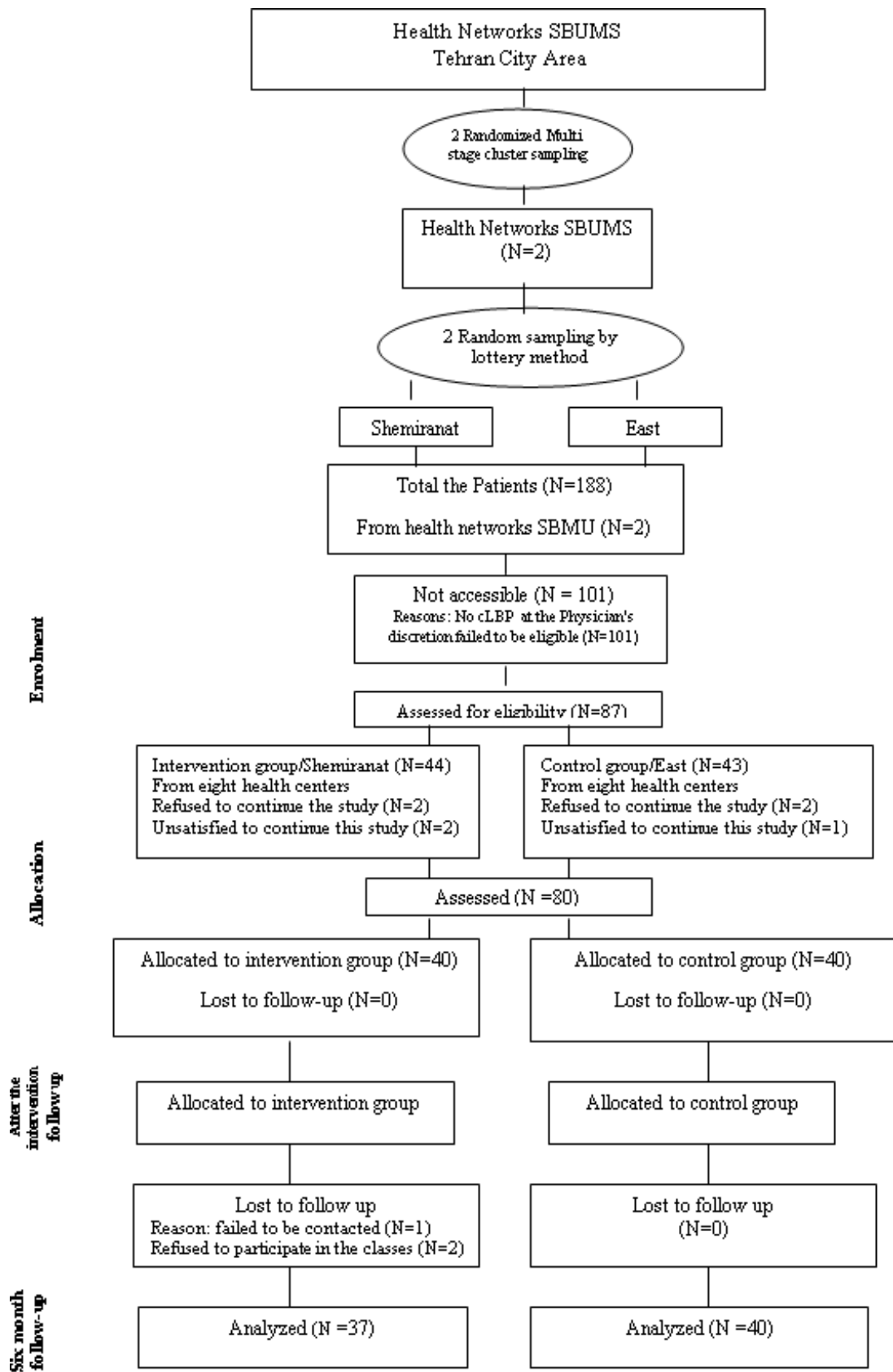
Figure 1. Sample size formula.

Figure 2. The TRA -BAC intervention the flow diagram of patients referring to comprehensive health service centers of Tehran in Iran.

The RAT-BAC intervention

Firstly the interventional program was designed based on the primarily studies (Heidari & Tavafian, 2017; O'Neill, O'Sullivan, O'Sullivan, Purtill, & O'Keeffe, 2020). This interventional program was completed in four periods of sessions at 1-week intervals and was performed by using two trained and professional physical and

health educators. The first session took 40 minutes. The educational program was designed based totally on the primary constructs of Reasoned Action (TRA) theory (Didarloo et al., 2011; Sharma, 2016; Stenner, Swinkels, Mitchell, & Palmer, 2016). The content of the intervention was evolved using eight instructions that applied in previous studies. In this session, the cLBP patients were familiar with how to do back exercises to modify musculoskeletal pain were discussed. In this session, the educational content was presented supplied through lectures, slide indicates, and role-playing. The second and third sessions took 40 minutes and divided into 20-minute sections. Inside section, the cLBP patients mentioned the factors influencing doing PA like the approaches to decrease to change misconceptions and improve positive and normative mental beliefs and motivation to comply to do PA. In the fourth section with 40 minutes section, the cLBP patients discussed the skill training for low back pain exercises.

Furthermore, in this section, the methods to improving motivation to comply with doing PA and improving subjective norms to try this behavior were mentioned. In the second 20-minute section, the competencies of doing PA behaviors for special muscles were practiced with cLBP patients. In all sessions six to eight cLBP patients took part. At the end of the 4 end sessions, the cLBP patients were furnished with a CD included the complete educational program.

The intervention group was recommended to perform back, the shoulder, Leg and Knee Exercises about 40 minutes per day, four sessions consistent. The individuals in the control group received the RAT-BAC program 6-months after the study completion.

Outcomes

The primary result was to improve Physical Activity-related behavior. The secondary consequences were enhancement in back care intention, attitude, normative beliefs, subjective norm, and evaluation outcome results conduct.

Outcome measures

The number one and secondary results were assessed the use of the following instruments that previously were employed by other investigator(Heidari & Tavafian, 2017).

The first author amassed the statistics through three questionnaires along with; the demographic questionnaire, questionnaires based on TRA regarding PA behaviors and Visual Analogue Scale (VAS) were used.

Qualitative and quantitative approaches were applied by 15 patients with cLBP to assess facial validity of TRA constructs questionnaire through which all their recommendations were inserted into the questionnaire. To confirm the content validity of the questionnaire, the expert panel including 12 professionals in different fields of health education, health psychologist, psychometric, physical medicine, and pain experts checked all the survey items by which The CVI value of ≥0.79 was observed acceptable for each item. The reliability was determined through Cranach's alpha coefficient that was in acceptable range of 0.80 to 0.95 in 8 subscales according to TRA constructs. Cranach's alpha was obtained as 0. 89. The study questionnaire questions with 7-point scale.

All of the questionnaires were completed by the participants of each group at the identical time lower back care-related behavior evaluation questionnaire based on the TRA (BAC-BAQ) was completed at the initial of the study, at 3, 6-month follow-ups. BAC-BAQ scale and VAS were completed at the initial of the study and 6-month follow-up; a practical checklist was also used to evaluate the Range of motion of the lumbar spine test skills with modified Schober.

The demographic questionnaire included 10 questions regarding resident status, marriage status, age, occupation, educational level, gender and another variable that were shown in Table1.

The second questionnaire was about the sub scales of BAC-BAQ (Heidari & Tavafian, 2017).TRA constructs questionnaire consist of 8 subscales according to TRA constructs (Figure 3). The BAC-BAQ questionnaire was discerned using a 10-item questionnaire. That questionnaire with four-option, Likert system from never to always scored 1 to four and the excessive scores indicated better situation anticipate. The BAC-BAQ scale was validated in previous study(Heidari & Tavafian, 2017). The content validity of the questionnaire changed into showed with the aid of the experts' panel. Those experts were 15 specialists, so, by studying books and similar articles and summing up the themes of interviews with health education and health promotion specialists and pain medicine experts, a questionnaire was set up and provided to professors, experts and experts in health promotion and education of Sports Medicine.

Table 1.Demographic characteristics of the studied cLBP patients of both groups at the initial of the study.

Group variable number	Intervention(N=37)	Control(N=40)	P-value [a]
	N (%)	N (%)	
Age(Yrs)			
30-39	6(16.2)	7(17.5)	
40-49	10(27.1)	11(27.5)	
50-59	9(24.3)	9(22.5)	0.65
60-69	6(16.2)	7(16.2)	
70-79	6(16.2)	6(16.2)	
Mean (SD)	41.04±4.23	39.03±3.48	
Marriage status			
Single	2(5.4)	3(7.5)	
Married	33(89.2)	36(90)	0.56
Widow	-	-	
Divorced	2(5.4)	1(2.5)	
Occupation Status			
Housewife`	16(43.2)	17(42.5)	0.22
Employed	21(56.8)	23(57.5)	
Duration of the disease			
in months (MOS)	37	40	0.63
Mean (SD)	12.38±8.67	12.32±7.2	
Duration of treatment			
in months (MOS)	37	40	0.22
Mean (SD)	14.05±11.07	17.09±11.01	
The degree of back pain			
at rest	37	40	0.06
Mean (SD)	3.07±3.17	4.05±2.24	
The degree of back pain			
while moving	37	40	0.43
Mean (SD)	4.78±2.26	5.26±1.64	

Mean (SD): Mean (Standard Deviation); Months (MOS).
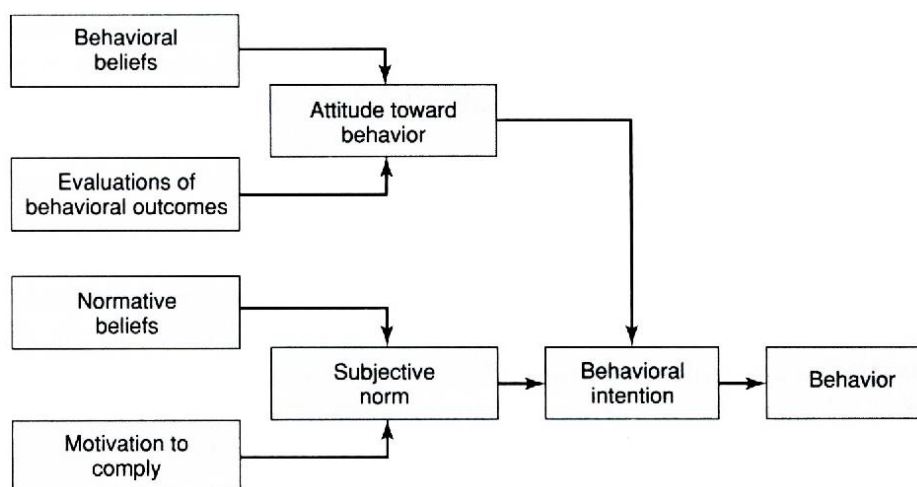
Figure 3. Schematic representation of Theory of Reasoned Action (Ajzen, 2015).

The TRA framework is based on the Theory of Reasoned Action (TRA) by which health behavior predicting factors have been shown.

The professional's panel reviewed all the items and supplied their consultants with a questionnaire and evaluated the questionnaire. The Content Validity Index (CVI) of the BAC-BAQ scale was 0.89 it is also necessary to compute (Content Validity Ratio (CVR) as a necessary criterion for terms "is useful, but not necessary, and does not require a statement". To determine the internal consistency of the questionnaire, a preliminary study was carried out on 30 cLBP patients with similar criteria to the research sample. The alpha range for BAC-BAQ scale was 0.87, indicating the internal consistency of the questionnaire.

A practical checklist also was used. the variety of motion of the lumbar spine was assessed skills with modified Schober (Williams, Binkley, Bloch, Goldsmith, & Minuk, 1993). This checklist was completed via by the members. This test had high validity and reliability (Williams et al., 1993).

The fourth tool was the Visual Analog Scale (VAS) for measuring musculoskeletal pain. VAS is a one-dimensional scale to measure pain intensity to measure pain severity through VAS, the cLBP patients were asked to choose various which showed their pain severity. On this scale, number 10 means severe pain and number zero means no pain. The Validity and reliability of instrument VAS are said in Breivik and et al evidences(Breivik et al., 2008).Translation of this scale into Persian language is to be and its validity/reliability is properly documented (Mousavi, Hadian, Abedi, & Montazeri, 2009; Naghdi et al., 2015).

Study Population

The sample size was calculated based on the following method (Figure1) in which – X1 = 4.51, S1 = 1.69, – X2 = 3.43, S2 = 1.42, (1-B = 80%) and (1-a = 95%) were considered with the parameter from previous document (Babazadeh, Banaye Jeddi, Shariat, Moradil, & Mokammel, 2017; Heidari & Tavafian, 2017) that has been performed in Iran, were used. Based totally on this formula, 33 subjects in every group were showed. However, with 10% dropout and considering sample attrition, and increasing the power of the study, 40 the cLBP patients were considered for each group.

Also, the minimal number of subjects in the sample changed into calculated usage G*Power software, version 3.1.9.7. SD α groups =0.5, A small effect size (f2=0.60) test power of 0.80, and an alpha of 0.05 were applied. We also considered an increase of about 10% to make up for viable losses and refusals, arriving at an approximate variety of 39.6 to 'almost equal 40' cLBP patients in each of both groups. In this context, the sample consisted of 40 intervention group & 40 control group for the interventional designed study analyses(Cohen, 1988).

Randomization

Tehran has East and Shemiranat districts. The observation was carried out in districts (north and East) where a population with a combined background are scattered across the districts. To choose the participants, multi-stage sampling was applied by which in the first stage10 health networks were decided on randomly and inside the next level; two health networks were selected randomly as intervention (Shemiranat center with 40 cLBP patients) or control (east center with 40 cLBP patients) group who were eligible and satisfied to enter into the study were selected randomly. All the recruited cLBP patients were visited by way of the same physician to affirm the diagnosis and were divided into the control or intervention group thru random blocking of every two participants. The physician and the person responsible for randomization were blinded to the allocation series.

The procedure and objectives of the study were explained to the participants, and the name and traits of the cLBP patients were saved exclusively. Informed consent was obtained from each cLBP patient. The participants in both groups were evaluated every two months by the physician that made the initial assessment, but the cLBP patients could also see the physician earlier on request. At some stage in the study, medications such as analgesics, no steroidal anti-inflammatory drugs (NSAIDs), and antidepressant drugs were prescribed for participants in the two groups if necessary. Finally, at 3, 6- month follow up 40 cLBP Patients in intervention and 37 cLBP Patients in the control group were assessed. Figure 1 shows the complete procedure of sampling. The RAT-BAC study was performed and reported following the CONSORT guidelines.

Those cLBP patients were randomly divided into an intervention group (N= 40) who complied w
ith the educational program based on TRA and a control group (N=37) who did not receive the program.

Statistical methods

The data were gathered thru a demographic questionnaire and a questionnaire based on TRA at three times of baseline, 3- and 6- month follow-ups and analyzed using SPSS version21. For quantitative data, an Independent Sample t-test was used in order to determine baseline group differences. A repeated measure multivariate analysis of variance was calculated with "test time" as a within-subjects factor (pre-test, 3-months, and 6-months follow-up), and "group" as a between-subjects factor (intervention vs. control group).

Ethics approval and consent to participate

All ethical subjects were considered. The study procedures were absolutely explained to the potential participants. To ensure confidentiality, the cLBP patients were requested not to provide their names in the questionnaires. All cLBP patients voluntarily signed the consent form to be studied. The ethics committee of Tarbiat Modares University (TMU) approved the observation via identity variety of the code IR.

MODARES.REC.1398.163. the Randomized Clinical trials registration at http://www.clinicaltrials.in.th web pages address approved the study through ID number of TCTR20190728001. This study was changed into performed in accordance with the declaration of Helsinki. The authors of the present observation do not intend to share individual de-identified participant statistics.

Results e discussion

A total of 80 eligible cLBP patients finished the study. The mean ages of control (N=40) and intervention group (N=37) were 39.03 ±3.48 and 41.04 ±4.23 respectively. Table 1 shows the contrast of socio-demographic characteristics of studied cLBP patients between both groups at the initial of the study. In line with this table, there were no significant differences between the two groups (P > 0.05).

The mean scores of predictive constructs based on Physical Activity-related behavior of the two studied groups at three-time points were shown in Table 2. As this Table showed the mean scores of the predictive constructs of both groups were the identical at initial of the study (p>0.05). However, the independent t-test showed these scores were improved in the intervention group after the educational intervention (P <0.001). The results from repeated measure analysis of variance at the baseline, 3, 6-month follow-up were shown in Table 2. According to this Table, there were significant differences in scores of predictive constructs within each group by time (P<0.001), within the time period, and between-group.

Differences in PA among the 2 groups were also tested thru this analysis. As a result, the mean differences between two groups at baseline, 3, 6-month follow-up were significant (P<0.001) (Table 2).

Table 2. The contrast of each group over time in terms of predictors of stretching exercising and the stretching exercising behavior at 3-time points of the study.

Variables	Time follow-up	Intervention (N=37) Mean±SD	Control (N=40) Mean±SD	P- value [a]		
				Time difference	Group difference	Time & group Interaction
Intention	Baseline	3.46±1.22	3.58±1.29	<0.001	0.001	0.004
	3- month Follow-up	9.32±1.35	4.38±2.08			
	6- month Follow-up	5.06±0.69	4.08±1.02			
P-value [b]		<0.001	0.465			
Attitude	Baseline	44.04±323.01	25.37±10.00	<0.001	0.002	0.002
	3- month Follow-up	62.06±31.11	48.65±12.16			
	6- month Follow-up	68.12±18.75	46.12±12.24			
P-value [b]		< 0.001	0.218			
Behavior beliefs	Baseline	14.52±3.02	8.03±2.46	<0.001	0.003	0.003
	3- month Follow-up	19.62±3.71	9.05±1.45			
	6- month Follow-up	16.37±2.77	9.36±3.09			
P-value [b]		<0.001	0.323			
Motivation to comply	Baseline	9.46±1.32	9.06±2.03	0.005	0.001	0.005
	3- month Follow-up	11.30±1.07	9.08±2.08			
	6- month Follow-up	12.02±1.20	10.08±1.09			
P-value [b]		<0.001	0.423			
Normative beliefs	Baseline	8.08±2.01	8.25±0.51	<0.001	0.002	0.002
	3- month Follow-up	11.35±2.08	8.21±0.51			
	6- month Follow-up	13.14±1.04	8.23±0.43			
P-value [b]		<0.001	0.425			
Evaluation outcome behavior	Baseline	8.12±3.11	8.16±1.48	<0.001	0.001	0.001
	3- month Follow-up	12.28±1.08	9.12±1.78			
	6- month Follow-up	11.34±1.06	9.15±2.46			

Variables	Time follow-up	Intervention Mean±SD	Control Mean±SD	Time difference	Group difference	Time & group Interaction
	P-value [b]	<0.001	0.407			
Subjective norms	Baseline	40.65±18.84	40.02±06.46	<0.001	0.001	0.001
	3- month Follow-up	68.14±15.86	53.01±10.33			
	6- month Follow-up	72.35±13.06	48.09±10.28			
	P-value [b]	<0.001	0.232			
PA behavior	Baseline	3.46±1.06	2.58±1.09	<0.001	0.001	0.001
	3- month Follow-up	4.23±1.08	3.38±1.03			
	6- month Follow-up	8.38±1.05	3.23±1.04			
	P-value [b]	<0.001	0.232			

Values are presented as Mean±SD, [a)] Repeated measure analysis Test, [b)] independent t-test

Moreover, each group was significantly different at different times (P<0.001) and the interaction between time and group was also different significant (P<o.001) (Table 2). The pain severity "the degree of back pain at rest/ while moving" also in intervention group (3.75±2.24) was significantly less than the control group (4.28±3.02) after 6-month follow up (p<0.001). The pain severity was measured through VAS (Table 3). But, the two groups were the identical at initial of the study in this regard. The range of motion of the lumbar spine differs from the modified Schubert test in each intervention and control group and reduced in the intervention group (p <0.05). (Table 4).

Table 3. Evaluation of pain severity among two at three-time points of the study.

Variables	Time follow-up	Intervention (N=37) Mean±SD	Control (N=40) Mean±SD	P-value [a]		
				Time difference	Group difference	Time & group Interaction
The degree of back pain at rest	Baseline	3.23±3.15	4.35±2.04	0.058	0.008	0.069
	3- month Follow-up	4.87±2.12	5.22±2.12			
	6- month Follow-up	3.75±2.24	4.28±3.02			
	P-value [b]	<0.001	0.387			
The degree of back pain while moving	Baseline	5.78±3.16	6.19±2.16	0.053	0.001	0.025
	3- month Follow-up	7.41±2.55	7.58±2.43			
	6- month Follow-up	5.68±3.27	6.46±2.44			
	P-value [b]	<0.001	0.294			

VAS, visual analogue scale.

Table 4. Comparison of the mean score of lumbar spine range of motion between two groups at three time points of the study.

Variables	Time follow-up	Intervention (N=37) Mean±SD	Control (N=40) Mean±SD	P- value [a]		
				Time difference	Group difference	Time & group Interaction
The range of motion of the lumbar spine	Baseline	8.65±11.34	8.98±11.27	<0.001	0.001	0.003
	3- month Follow-up	16.32±11.87	11.84±11.78			
	6- month Follow-up	13.56±17.05	10.23±18.45			
	P- value [b]	<0.001	0.344			

Schober, modified Schubert test.

The present study showed that the educational intervention based on the predictor constructs of TRA including intention, attitude, subjective norms, normative beliefs and Evaluation outcome behavior could significantly improve the PA behavior among cLBP patients at 3, 6-month post-intervention. The outcomes of the present study showed that the interventional program could significantly enhance predictive constructs inside the intervention group. Therefore, it might be argued that the PA behavior improvement in the intervention group has been due to improvement in these predictive constructs.

The results of the present study confirmed that the educational program was able to enhance and increase PA behavior in the intervention group. The strength of the present study was the comprehensive acquaintance

with the importance of Subjective norms and normative beliefs for regular daily PA, which with this program, caused the patients in the intervention group to feel that their health is important for their family and friends (Laird, Fawkner, & Niven, 2018).

According to the findings of the Carvalho study, misbeliefs can be due to disability for patients with cLBP(Wertli, Rasmussen-Barr, Weiser, Bachmann, & Brunner, 2014).The present study determined standards for performing exercises, people accept or reject norm-based behavior. Thus, according to the Sonnet study, social support is a predictor of PA(Sweeney, Wilson, & Van Horn, 2017). Encouraging patients to engage in PA was considered in the educational program. The same thing happened in education to persuade patients because it increased PA in group discussions.

In study Chavo, like the present study, confronted patients with cLBPwith misbeliefs (Chou & Shekelle, 2010).In this study, the intervention group received a motivational educational program based on one of the constructs of Theory of Reasoned Action (TRA), which showed that this motivation has increased compared to the control group and became statistically significant (Rainville et al., 2011).The results of studies show that patients with cLBPare more motivated to engage in healthy behaviors when they visit health centers(Boogar & Tabatabaeian, 2012). Other studies have confirmed the conclusion that successive interventions have led to the correction of normative beliefs(Boogar & Tabatabaeian, 2012).

The results of research by Airaksinen et al. (2006). Showed that people who attended more sports classes were more aerobically prepared. Levels of daily activities in this group were significantly improved after the intervention. Therefore, similar to the present study, in addition to the existence of various studies that indicate the predictability of health behavior(Airaksinen et al., 2006). Findings of the present study, contrary to studies (Airaksinen et al., 2006)., showed that behavioral intentions were predictors of PA behavior (McKee et al., 2020).

Akbari's study showed that regular yoga exercises reduce pain and disability and increase back flexion in women with chronic lumbar disc herniation(Akbari & Rezaei, 2012). This increase was also visible between the two groups in the present study by evaluating the range of motion of the lumbar spine curvature with the help of the modified Schubert test, but more studies are needed to test the effectiveness of different exercises, so that their comparative benefits in terms of Make the type of educational and non-educational interventions clearer. Because in Akbari study, unlike the present study, no significant difference was found between the two methods used in terms of reducing pain, reducing the intensity of ability, reducing anxiety and also changing the range of motion of lumbar flexion. Along with the results of other studies in this field and according to the available evidence, it is recommended to conduct a comprehensive study with advanced tools.

The present study significantly improved performance in patients with the disease. The results of this study are consistent with the findings of Honesty et al., Who investigated the effect of strengthening the central stabilizing muscles of the spine in water on the severity of lumbar pain and lordoses (Sedaghati, Hematfar, & Behpour, 2013). It is also consistent with similar findings of the research of Farhpour and Rainville et al. And is not consistent with the findings of Moon & et al (Rainville et al., 2004; Farahpour & Esfahani, 2008; Moon et al., 2013;).

Findings of this study revealed that evaluation regarding PA and normative beliefs behavior could affect the intention to engage in greater PA than those with other constructs. Therefore, it is proposed latter studies should be done to confirm these findings and consequently, proper interventions based on these predictors be designed for the patients with cLBPto do more PA behavior. Attitude by the patients with cLBPmay promotion those from engaging in PA intention while being their behavior beliefs cause in the attitude of doing PA behavior.

Conclusion

This study revealed that improving intention, attitude, subjective norms, normative beliefs and Evaluation outcome behavior among cLBP patients could enhance PA behavior in this target group. However, doing extra researches to confirm the effects are assured.

The use of TRA theory-based interventions can be offered to increase physical activity. This study showed that patients who had a positive belief in the consequences of PA behavior in terms of attitudes and Subjective norms, respectively, were more likely to do so. Therefore, cognitive, behavioral and psychological factors can contribute to the experience of pain in patients with cLBP.

Acknowledgments

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