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# A Theory of Reasoned Action-Based Study Predicting Factors of Chronic back pain sufferers' Physical Activity Behavior to Exercise

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Keywords: reasoned action; behavior; models; self-care



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Article

# A Theory of Reasoned Action-Based Study Predicting Factors of Chronic back pain sufferers' Physical Activity Behavior to Exercise

Short Running: Physical Activity Behavior Low Back Pain

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**Abstract: Objective:** Low PA in cLBP is effective in the area of QoL and is associated with various biological and psychosocial factors. The current study aimed to investigate predictors of PA behavior in cLBP patients. **Method:** Three hundred eligible patients with cLBP were randomly selected to comprehensive health service centers in SBUMS. To identify predictors of PA behavior of reasoned action (TRA) through OR. Finally, 280 cLBP patients with a mean age of 57.07±13.09 years participated in the study. **Results:** Motivation to comply in cLBP patients was a significant predictor for subjective norm OR (95CI): 2.095 (0.116-2.792), p-value<0.001, a significant predictor of intention to perform PA behavior OR (95CI): 1.431 (0.138-1.538), p-value <0.001). Behavioral beliefs can also be predictive for attitude OR (%95CI): 1.276 (0.106-1.355), p-value = 0.002. Attitude, normative beliefs, subjective norm and evaluation outcome behavior can predict cLBP patients for intention to perform PA behavior (OR (95CI): 1.188 (0.032-1.312), p-value<0.001). : 1.158 (0.076-2.208), p-value=0.003., OR (%95CI): 1.104(0.076-1.128), p-value<0.001., OR (%95CI): 0.814(0.301-1.4) value = 0.007). **Conclusion:** cLBP patients' normative beliefs and evaluations about PA behavior can influence the intention to do more PA through the constructs of attitude and subjective norm.

**Keywords:** reasoned action; behavior; models; self-care

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## Introduction

A lot of the population suffers from chronic low back pain (cLBP). cLBP is a high-cost and prevalent disease such that could want to physical disabilities, social and mental health engagement[1], cLBP is determined through a complicated interaction among pain, behavior and biopsychosocial factors[2].

Although, there are several treatment procedures to improve cLBP, cLBP control and management programs to be more effective than others support to change behavior[2]. Physical Activity (PA) is observed as an effective intervention in the management of cLBP patients[3]. Although PA education have been shown to benefit cLBP patients[4].

## Background

The theory of reasoned action (TRA) is one of the theories that claims that people consider the consequences of their actions before making decisions to engage or disengage in any given behavior[5]. Individuals who have positive beliefs and positive outcome evaluations about PA behavior are more likely to engage in healthier behavior[6]. However this theory check that healthy behaviors will be predicted by the subjective norm[7]. evidence showed that patients' perceptions of the social cognition and social environment effected on PA[8].

Social cognitive concept (SCT) proposed that patients' behavior occurred even as each individual-level cognitive factors interacted with the environmental factors[9]. In this regard, our study was conducted with the aim of determining predictors of physical activity behavior among

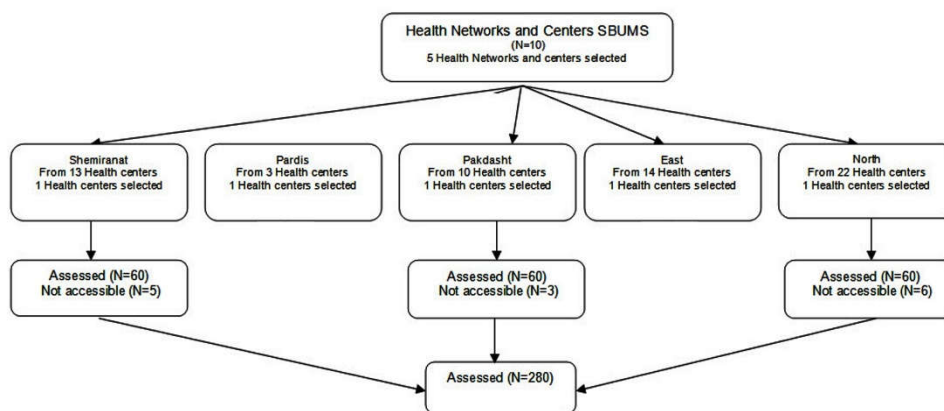
cLBP patients With reference to the comprehensive health service centers of Shahid Beheshti University of Medical Sciences (SBUMS), Tehran, Iran.

## Materials and Methods

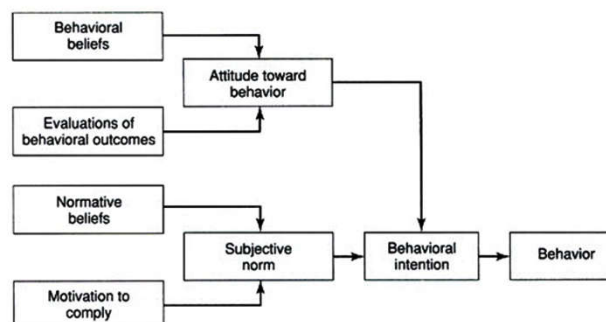
### Participants

This study was conducted among patients referred to five comprehensive health service centers. Health networks and centers of North, East, Shemiranat, Pardis and Pakdasht area of Tehran and were affiliated to SBUMS, from 13 January - 27 August 2019). This article is part of postdoctoral research. After describing the aims and methods, all patients were satisfied to be studied and knowingly and voluntarily signed the written consent forms. This study was approved by the research ethics committee of (**without university name**) on January 2019 with ID: IR.MODARES.REC.1398.163 and Trial Identification Number in Clinical Trials Registry was TCTR20190728001.

300 eligible cLBP patients referred to comprehensive health service centers in SBUMS Tehran, Iran from 13 January to 27 August 2019 were random selected A total of 280 cLBP patients with an average age of  $57.07 \pm 13.09$  years participated in this study. Figure 1 shows the procedure of patients sampling, according to Inclusion & Excluding criteria [10] to identification Predictors of PA behavior (Figure 2), All theory of reasoned action (TRA) constructs were examined for risk factors to see if they influence the probability of PA behavior. SPSS version 19 was used for data analysis. The odds ratio was used to determine whether particular exposures like TRA constructs could be risk factors for occurrence of the outcome like PA[11]. Based on the existed reference the sample size based on estimate five people per item[12]. So for one 60 sample size item questionnaire were calculated 60 times  $5 = 300$ .



**Figure 1.** Flow diagram of participation sampling among the Patients Referring to Comprehensive Health Service Centers of Tehran, Iran.



**Figure 2.** Schematic representation of the theory of reasoned action (Ajen, 2015). The TRA framework is based on the theory of reasoned action (TRA), which has been shown to be a predictor of health behavior.

### Study Design

In this cross-sectional study, questionnaire TRA regarding PA behaviors and demographic questionnaire, were used. TRA constructs questionnaire consist of 8 subscales according to TRA constructs (Figure 2). The PA behavior questionnaire was discerned using a 14-item questionnaire.

Qualitative and quantitative approaches were applied by 15 patients with cLBP to assess facial validity of TRA constructs questionnaire. To confirm the content validity of the questionnaire, the expert panel including 12 experts 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  $\geq 0.79$  was observed acceptable for each item. The reliability of the questionnaire was determined with the help of Cranach's alpha coefficient that was in acceptable range of 0.70 to 0.88 in 8 subscales according to TRA constructs. Cranach's alpha was obtained as 0.78. The study was questionnaire questions with 7-point scale except behavioral intention structure that was questions with 4-point scale.

### Data Collection and Analysis

To determine the relationship between different TRA constructs with each other and with PA behavior, R Spearman was apply because K-S test displayed the data were non parametric. To predict the factors influencing PA behaviors logistic regression analysis was applied. Lower odds of PA ( $P < 0.05$ ) was statistically significant.

### Results

Totally 300 patients with cLBP recruited of which 280 persons who were visited by the physician and they had inclusion criteria of the study. The means age of the patients was 57.7 years ( $SD=13.09$ ) and most of them were between 40 and 49 years old. (39.6%). Overall, 31.4% of the patients with cLBP ( $N=88$ ) were housewives. Table 1 show all socio demographic data as well as the Mean ( $SD$ ) of all studied variables based on TRA.

Logistic correlation test was used to examine the relationship between TRA constructs and PA behavior .Table 2 shows these correlations. As this table shows, there were a direct a significant correlation between behavior beliefs and attitude with intention. So that the patients who normative beliefs were more likely to the predictor for subjective norms significantly ( $p$ -value  $< 0.001$ ).

This study stated that motivation to comply in cLBP patients for norm subjective OR (95% CI): 2.095 (0.116-2.792),  $p$ -value $<0.001$ , a significant predictor of intention to perform the behavior was PA (Table 3). (95% CI). 1.431 (1.538-0.138),  $p$ -value  $<0.001$ , behavioral beliefs can be predictive for attitude OR (%95CI): 1.276 (1.355-0.106),  $p$ -value = 0.002). Attitude, normative beliefs, subjective norm, and evaluation outcome behavior can predict cLBP patients for intention to perform PA behavior (OR (95CI): 1.188 (0.032-1.312),  $p$ -value $<0.001$ ). : 1.158 (0.076-2.208),  $p$ -value=0.003., OR (%95CI): 1.104(0.076-1.128),  $p$ -value $<0.001$ ., OR (%95CI): 0.814(0.301),  $p$ -value 0.007).

**Table 1.** Socio-demographic characteristics of the studied the Patients.

Studied variables and Constructs	Sufficient	N (%)	Mean (SD)
Age	30-39	20(7.2)	57.07 $\pm$ 13.09
	40-49	111(39.6)	
	50-59	92(32.8)	
	60-69	39(13.9)	
	70-79	18(6.5)	

<b>Years of education</b>	12years	34(12.4)	12.08±10.87
	14 years	76(27.1)	
	16years(Bachelor)	80(28.6)	
	18 years(Master)	90(32.1)	
<b>Marital status</b>	Single	53(18.9)	-
	Married	178(63.6)	
	Widow	24(8.6)	
	Divorced	25(8.9)	
<b>Occupation</b>	Housewife`	88(31.4)	-
	Manager	12(4.3)	
	Employed	57(20.4)	
	Non-employed	43(15.4)	
	Farmer	14(5)	
	Worker	34(12.1)	
	Retired	32(11.4)	
<b>Intention</b>			4.80±1.18
<b>Attitude</b>			40.62±10.22
<b>Behavior beliefs</b>			6.38±2.42
<b>Evaluation outcome behavior</b>			7.26±2.46
<b>Normative beliefs</b>			6.39±2.87
<b>Motivation to comply</b>			8.34±12.84
<b>Subjective norms</b>			48.02±8.12

Mean (SD): Mean (Standard Deviation).

**Table 2.** Correlation matrix of the constructs of Theory of Reasoned Action in Physical Activity in the Patients Referring.

<b>Variables</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>1.Intention</b>	1						
<b>2.Attitude</b>	R=0.728**	1					
<b>3.Behavior beliefs</b>	0.413*	R=0.696**	1				
<b>4.Evaluation outcome behavior</b>	0.486**	0.635**	R=0.057	1			
<b>5.Subjective norms</b>	0.718**	0.024**	0.013**	R=0.112*	1		
<b>6.Normative beliefs</b>	0.566**	0.021	0.082	0.053	R=0.514**	1	
<b>7.Motivation to comply</b>	0.212*	0.011	0.133*	0.062	0.714**	R=0.554	7

Spearman's\*\* correlation is significant at the 0.01 level (two-sided). \* Correlation is meaningful at the 0.05 level (2-sided).

**Table 3.** Predictors of Physical Activity behavior based on Theory of Reasoned Action through logistic regression analysis.

<b>Independent Variable</b>	<b>Variables predictors</b>	<b>B</b>	<b>S.E</b>	<b>P</b>	<b>OR(%95CI)</b>
<b>Intention</b>	<b>behavior</b>	0.358	0.044	<0.001	1.431(0.138-1.538)
<b>Attitude</b>	<b>Intention</b>	0.173	0.072	<0.001	1.188(0.032-1.312)
<b>Behavior beliefs</b>	<b>Attitude</b>	0.244	0.058	0.002	1.276(0.106-1.355)
<b>Motivation to comply</b>	<b>Subjective norms</b>	0.74	0.044	<0.001	2.095(0.116-2.792)
<b>Normative beliefs</b>	<b>Intention</b>	0.099	0.078	0.003	1.158(0.076-2.208)
<b>Evaluation outcome behavior</b>	<b>Intention</b>	-0.206	0.076	0.007	0.814(0.301-1.440)
<b>Subjective norms</b>	<b>Intention</b>	0.146	0.046	<0.001	1.104(0.076-1.128)

## Discussion

Only some results of this study are in the line of results protected from previous study[13]. As well as the role of subjective norm and attitude were determined as influencing factors for PA behavior via Intention. The findings of the present study are fully in line with the theoretical assumptions of the theory of reasoned action[14]. On the other hand, Attitude means a general feeling of liking or disliking towards any given PA behavior[11].

In Carvalho's study, people who did not have a good attitude toward physical activity prevented their physical activity[12]. Moreover, in accordance with the present study, numerous studies have revealed that subjective norm has been as the best predictor variable for actual PA[14,15]. Therefore, strategies for raising subjective norm, such as strengthening subjective norm through Role Playing and focus groups discussion could lead to better and more effective health promotion programs Iranian cLBP patients and should be considered in future intervention[16]. Motivation to comply was as the predictor variable for subjective norm.

These programs could propose that highly individuals has normative beliefs and evaluation outcome behavior Make more effort to overcome and master PA behaviors through intention and persist longer in the face of obstacles that stand in the way of such intention to engage in PA behavior. Sweeney in their study showed that normative beliefs are predictors of persistence of physical activity[17]. Thus, studies have shown that positive social life is a good predictor of PA[17].

This study was verified that the patients' behavior beliefs could be a predictor of patients' towards PA via Attitude likes Kirks study[18]. Ajzen noted that behavior beliefs Increase the chance of PA involvement[19]. These results are confirmed by a large number of previous researches and show that the people who have the most beliefs of the patients about PA and they're self- evaluation regarding the outcome of PA to the performance of PA are more likely to do this behavior[20,21].

Outcome evaluation emphasizes that; encouraging patients with cLBP to do preventive behaviors of Back pain is chronic, so better to highlight the benefits and positive outcomes of doing

preventive PA behaviors to improve chronic low back pain. Previous evidence verified that preventive behaviors of chronic low back pain behavior could influence CLBP improvement [22].

## Conclusions

This study showed that all patients had positive beliefs and evaluated the consequences of PA behavior, respectively via attitude and subjective norms were more like to perform this behavior. Therefore, Cognitive, behavioral, and psychological factors can contribute to the experience of pain among patients with cLBP [23]. There is a need for cognitive-behavioral educational intervention based on the theory of reasoned action on changing the preventive behaviors and beliefs of chronic back pain. But behavioral intentions are interpreted as a key predictor of action in many health behaviors theories[24]. Consistent this study prediction, the Carroll study showed a significant and positive correlated between the health behavioral intentions of cLBP patients with low back pain prevention behaviors[24].

## Relevance for Clinical Practice

After obtaining the predictive constructs of the present study, an intervention program will be conducted in four training sessions at one-week intervals by two trained physical education and professional health instructors. The educational program will be designed and used completely based on the basic constructs of the theory of reasoned action

## Limitations

First, the data used were collected through self-report that might interfere this study results. The cLBP patients were randomly selected from one university. However a number of key factors like large sample size were considered to ensure the representation of the population under study.

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**Author contribution:** M H D conducted whole study and had full access to all data for analysis. AH, supervised study and also contributed to the drafting of the article. FP verified the data analysis. All authors confirmed the final version of the manuscript.

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**key points:** The (Theory of Reasoned Action )TRA constructs questionnaire could be a validated and reliable instrument to determine the factors that influence Physical Activity Behavior among 280 cLBP patients who Referring to Comprehensive Health Service Centers in the Shahid Beheshti University of Medical Sciences in Tehran, Iran. it is also suggested that the TRA constructs questionnaire should be justified to other languages and cultures so that it could be applied in other countries. Given that our study has found effective factors for physical activity in patients with low back pain, it is possible to focus on these factors for more effective training to make training more effective and cost-effective. Appropriate interventions based on these predictors should be designed to motivate patients with low back pain to engage in physical activity. The use of TRA constructs is more efficient than models. However, to do more research to ensure that these results are recommended.

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**Conflict of interest:** The authors acclaimed that they have no rivaling interests.

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