Identification of the factors predicting the Stretching Exercise Behavior among office employees with reinforcing and developing the performance of the Health Promotion Model

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ABSTRACT

Musculoskeletal Diseases (MSDs) is the most common occupational health problem and affect workplace employees which MSDs are increasing in Iran. This study aimed to identification of the factors predicting the Stretching Exercise (SE) behavior among Office employees with reinforcing and developing the performance of the Health Promotion Model (DHPM) in Shahid Beheshti University of Medical Sciences (SBUMS) of Iran. This cross-sectional study, data were collected a questionnaire-based on HPM for SE behaviors and Self-Regulation, Counter-conditioning, and Stimulus control questionnaire (DHPM) From eligible 385 office employees working in comprehensive service centers for urban-rural health affiliated to SBUMS, selected by Multistage cluster sampling from May to Sep 2017. All structures were examined as predicting factors to decide whether or not they affect the likelihood of the prevalence of SE behavior. The data were analyzed using Confirmatory Factor Analysis the method by Amos software 22 and regression analysis with SPSS 19 software. Totally 385 office employees with mean age of 39.4±7.76 years old took part. The effects of the validity of two versions of HPM (RMSEA= 0.067, x2/df=2.98, GFI&CFI=0.90) and DHPM in confirmatory factor analysis confirmed that fitness Indexes of the DHPM (RMSEA= 0.059, x2/df=2.38, GFI&CFI=0.97) were better. Regression analysis reflected that the coverage ratio of SE behavior variance of the DHPM is more than the HPM. This study showed that perceived barriers to action could prevent the studied participants from engaging in stretching exercise. Perceived self-efficacy, Commitment to a plan of action, interpersonal influences, and Stimulus control were significant predictors for SE behavior.

Key Words: health promotion, exercises, musculoskeletal, sedentary lifestyle, occupational health

Introduction

Musculoskeletal disorders (MSDs) are conditions that can affect person's muscles, bones, and joints. MSDs are widely known as chronic pain (Brooks et al., 2017). In most studies, office employees were confronted with this problem faced by at the workplace (Ghasemi et al., 2018). according to the guidelines of Therapeutic exercise, Stretching Exercised (SES) and biopsychosocial rehabilitation may reduce muscle-skeletal pain and increase their functional ability (Pain, 2013; Tavafian et al., 2014). Studies findings suggested that if SES is long-lasting especially, they are effective in improving MSDs in office employers with chronic pain (Asih et al.,

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2018; López-de-Uralde-Villanueva et al., 2016; Searle et al., 2015). Insufficient Physical Activity (PA) is one of the most important causes of Work-Related Musculoskeletal Disorders (WMSDs) worldwide, especially in Iran (Organization 2015). WMSDs are defined as a group of painful disorders in various parts of the body, such as muscles, tendons, and nerves by work (Saedpanah et al., 2018). SE involves stretching of the muscle or tendons to achieve better muscle tone, improve muscle control, flexibility and better performance (Kisner et al., 2017, Caban-Martinez et al., 2014).

The office employers usually sit on their desk for a long time (Mohammed & Naji, 2017). Despite the benefits of using SES for office employees (Mohammed & Naji, 2017) office employees do not fully understand their benefits without the support of their peers in the form of psychological factors support (Brooks et al., 2017).

Therefore, Identification of the factors predicting the SE Behavior among office employees with reinforcing and developing the performance of the Health Promotion Model (DHPM), it is serious to many researchers who are engaged with designing proper educational interventions to advance this healthy behavior among office employers (Ivarsson et al., 2017).

Health Promotion Model (HPM) there is a model that predicts behavioral health factors and may help the office employees to develop healthy behaviors (Pender, Murdaugh, & Parsons, 2015).

On the other hand, the structures of developed of HPM by using the effects of substitution process modification, Counter conditioning, Self-Regulation, and stimulus control are on regulated to avoid Immediate competing demands and preference, can predict doing of stretching exercise behavior.

In studies, the effects of substitution process modification, Counter conditioning, Self-Regulation, and stimulus control have been investigated on immediate competing demands and preferences as well as on exercising behavior (Bach & Dayan, 2017; Foxall, 2017). Counter conditioning is a technique that focuses on changing our responses to stimuli. Counter conditioning that tries to replace bad or unpleasant emotional responses to a stimulus with more enjoyable, adaptive responses. Self-regulation includes the ability to set goals, monitor individual behaviors to ensure that they are consistent with goals, and having the willpower to persist until

goals are reached and it was the reference to our capacity to direct our conduct. Resistance to the person Against Immediate competing demands and preference depends on the ability to be self-regulation and Stimulus control (Buckley et al., 2014; Niven & Hu, 2018; Pender et al., 2002). Cardinal and colleagues' studies showed that the process of Counter conditioning and Stimulus control was the most frequent Between action and maintenance process (Cardinal & Kosma, 2004).

Stimulus control is a phenomenon that occurs when an organism behaves in one way in the presence of a given stimulus and another way in its absence. According to the HPM model's requirements to expand its predictive factors in modulating the immediate competing demands and preference structure and considering the potential impact of the three above mentioned structures on the enhancement and development of this model as a facilitator and increasing the perception of the office employees about the response to stimuli, the replacement of the response with pleasant emotions and the strengthening of the monitor individual behaviors, the relationship between these three structures by performing stretching exercise ; It seems that the development of the performance of this model is helpful in predicting stretching exercise.

In this regard, the present study aimed to identification of the factors predicting the SE Behavior among Office employees with reinforcing and developing the performance of the Health Promotion Model (DHPM) in Shahid Beheshti University of Medical Sciences (SBUMS) of Iran.

Materials and methods

Participants

This cross-sectional study was done among office employees of Shahid Beheshti University of Medical Sciences (SBUMS) located in Tehran, Iran from May to September 2017. All ethical issues were considered in this research. All studies methods for office employers were explained completely. All office employers voluntarily signed the written consent form to be studied. The ethics committee of Tarbiat Modares University (IR.TMU.REC.1395.329) approved. 385 office employees who were working in three health networks of North, East and Shemiranat Health Centers and health network affiliated to SBUMS and were satisfied to be studied were recruited. The population, from which the study

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sample was selected, received their health services from urban health centers covered by the above health networks. Multistage cluster sampling was applied to select the potential participants. In the first stage, the Health Networks SBUMS was selected randomly from the ten Health Networks. Then, three health networks were selected randomly from the eight Health centers in the Health Networks. The sample size turned into estimated on the basis of 5 office employers for any item (Munro, 2005). Therefore, for a 77-item questionnaire a sample size of (77 × 5) 385 for confirmatory factor analysis (CFA) in Amos were calculated and allotted, out of which 362 were finished.

Study Design

In this cross-sectional study, the demographic characteristics questionnaire, self-administered questionnaires based on HPM and a questionnaire regarding stretching exercise behaviors were used. According to the questionnaire of stretching exercise behaviors, participants were asked one question about performing due exercises like if they performed enough stretching exercise for a specific muscle such as neck stretching, shoulder stretching, and back extension exercises.

The questionnaire regarding DHPM constructs was made by the researchers based on the context of DHPM constructs, existed literature regarding stretching exercise and interview with key persons (Delshad et al., 2019).

Inclusion criteria were as: working in the SBUMS as the office employee, working with the computer for more than four hours a day as his / her job. And being satisfied to be studied. Excluding criteria were as suffering from any disability or illness that prevents them from doing stretching exercises, is not allowed to do SE because of their physicians' recommendation.

Enough stretching means stretched position for each muscle up to 10 to 30 seconds to be repeated 3 or 4 time, five days/week once every 20 minutes (Gasibat, Simbak, Aziz, Petridis, & Tróznai, 2017). The answer for this question was a 2-option scale of Yes or No. The Continue questions Stretching Exercise behaviors were assessed using a 10-item questionnaire. Answers for these questions were evaluated by a 3- option scale with a range of 1 to 3. Therefore, the total score was from 10 to 30 that the lower score was worse behavior.

The facial validity of the questionnaire was done through qualitative and quantities' approaches. For qualitative approach, from 15 office employees assessed each item for "ambiguity" relevancy", and "difficulty by which three items needed to be corrected. 77 items remained. The reliability was determined by measuring Cranach's alpha coefficient. The Cranach's alpha domain for the HPM constructs was from 0.7 to 0.88 which approved the constructs reliability.

The HPM questionnaire included following sections based on HPM constructs (Delshad et al., 2019). One- Self Regulation of stretching exercise was assessed through a seven-item questionnaire. One of the questions was as "When I consider a particular goal for stretching, my motivation rises for doing it. Answers to the questions of this construct were evaluated in a 5-option scale from never to always. The rate for each statement was in a range of 1 to 5. Therefore, the total score for this questionnaire is from 7 to 35 points and the higher score shows better status.

Two- Stimulus control towards engaging in stretching exercise was evaluated through a five-item questionnaire. One of the questions here was a: "I spend my rest time doing stretching exercises at workplace ". Answers for this questionnaire were evaluated in a 5-option scale from never to always. The rate for each statement was in a range of 1 to five. Therefore, the total score criterion was from 5 to 25 points and the higher score showed the worse position.

Three- Counter conditioning was assessed using a five-item questionnaire. One of the items was as "Instead of sitting at the computer desk and waiting for a tea, I prefer to go and make tea myself." Answers for this questionnaire were evaluated in a 3-option scale from never to always. Therefore, the rate for each statement was in a range of 1 to 3 and the total score criterion was from 5 to 15 points, and the higher score showed better status (Delshad et al., 2019).

Statistical analyses

Data were entered into the SPSS software version 19, Confirmatory Factor Analysis the method by Amos software 22, and analyzed through Regression analysis. $P < 0.05$ was thought-out statistically substantial.

Construct Validity

In the current study confirmatory factor analysis (CFA: with maximum likelihood estimation) was

applied. Good fit indices in EFA; and REMSEA < 0.05, GFI > 0.9, AGFI > 0.9, P value > 0.05 were considered as good fit indices in EFA.

Results

Totally 385 office employees recruited of which 362 office employees took part and filled the question are completely (response rate 97.2%). The means age of the participants was 39.4 years (SD= 7.74) and most of them were between 30 and 34 years old (32.3%).

The highest rate of body mass index or BMI (kg/m2) was Male 25.6 ± 3.8 against Female 21.2 ± 7.8. 39.2% of employees had no children and 42% had one child and 18.8% More than one child. CVI and CVR of each question were > 0.79.

Fig. 1 shows the procedure female Schematic representation of the DHPM model Path Using Confirmatory Factor Analysis (CFA).
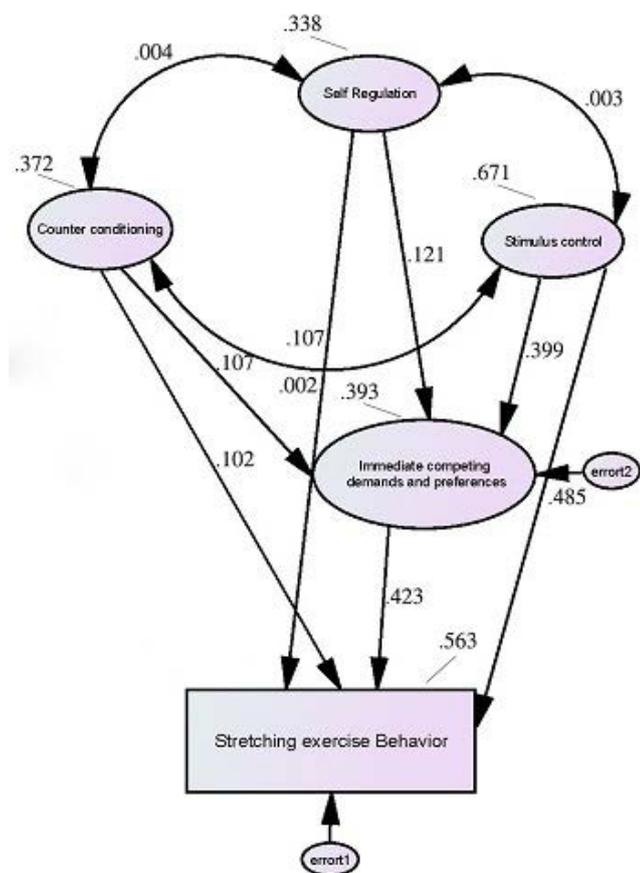

Figure 1. Schematic representation of the DHPM model Path Using Confirmatory Factor Analysis (CFA)

Table 1 shows descriptive statistics all studied variables based on developed of HPM. Table 2 shows the comparison of Health indexes of confirmatory factor analysis in both HPM and DHPM versions. The results of this table show that in terms of obtaining

Table 1. Descriptive statistics for the Developed of HPM and of Stretching exercise

Description Scale	Mean±SD	Range Observed
Perceived benefits	17.90±5.05	8-24
Perceived barriers	20.31±6.03	9-36
Perceived Self efficacy	17.15±3.71	7-28
Activity-Related affect	16.27±2.45	7-21
Interpersonal influences	11.55±4.64	5-25
Commitment to plan	16.82±4.28	8-32
Immediate competing demands and preferences	11.70±2.80	7-16
Situational influences	14.21±4.59	9-36
Stretching Exercise (SE)	17.64±2.48	10-30
Self-Regulation	19.71±4.98	7-35
Counter conditioning	12.41±2.53	5-15
Stimulus control	11.99±2.80	5-25

Table 2. Comparison of fitness indices of confirmatory factor analysis in two versions of HPM

Index	HPM	DHPM
Chi-square	1.06	1.88
Degrees of freedom	2	3
P-value (Chi-square)	<0.001	<0.001
Chi-square / Degrees of freedom	2.98	2.38
Comparative Fit Index (CFI)	0.90	0.98
Normed Fit Index (NFI)	0.89	0.92
Incremental Fit Index (IFI)	0.90	0. 95
Non-Normed Fit Index (NNFI)	0.91	0. 97
Root Mean Square Error of Approximation: RMSEA	0.067	0.059
Standardized Root Mean Square Residual: SRMR	0.09	0.07
Goodness of Fit Index (GFI)	0.90	0.97

better values for NNFI, x2 / df, RMSEA and SRMR indices, the DHPM model was somewhat better in terms of health. Therefore, it can be concluded that the three constructs mentioned have a positive and effective role in increasing the fit of health of Pender Health Promotion Model.

The effects of the validity of two versions of HPM (RMSEA= 0.067, x2/df=2.98, GFI&CFI=0.90) and DHPM in confirmatory factor analysis confirmed that fitness indexes of the DHPM (RMSEA= 0.059, x2/df=2.38, GFI&CFI=0.97) were better.

As regression analysis shows in Table 3,4, in DHPM perceived barriers to action is a negative predictor for engaging in stretching exercise with (B = -0.106, P<0.001), perceived self-efficacy is a positive predictor with (B = 0.172, P<0.001), Furthermore, interpersonal influences with (B = 0.099, P=0.003), Commitment to a plan of action with (B = 0.173, P=0.016), and Stimulus control(B = 0.193, P=0.007),were positive predictors for the stretching exercise behavior.

Table 3. Regression analysis of predictive structures for adopting stretching exercise behavior in the of the Health Promotion Model

Independent variable	B	β	P-value	R Square	Dependent Variable
Perceived benefits of action	- 0.032	- 0.003	0.441		
Perceived barriers to action	- 0.104	0.346	<0.001**		
Perceived self-efficacy	0.170	0.339	<0.001**		
Activity-Related affect	- 0.104	- 0.086	0.149	.445	Stretching Exercise (SE)
Interpersonal influences	0.096	0.162	0.033		
Commitment to plan of action	0.176	0.168	0.010		
Immediate competing demands and preferences	0.030	- 0.004	0.554		
Situational influences	- 0.005	- 0.084	0.177		

Note: Model R2 = 0.297, * P < 0.05, ** P < 0.01.
B = unstandardised beta co-effcient, β = standardised beta coeffcient.

Table 4. Regression analysis of predictive structures for adopting stretching exercise behavior in the extended version of the Health Promotion Model

Independent variable	B	β	P-value	R Square	Dependent Variable
Perceived benefits of action	- 0.031	- 0.002	0.471		
Perceived barriers to action	- 0.106	0.322	<0.001**		
Perceived self-efficacy	0.172	0.327	<0.001**	.782	Stretching Exercise (SE)
Activity-Related affect	- 0.116	- 0.078	0.112		
Interpersonal influences	0.099	0.150	0.003**		

Note: Model R2 = 0.560, * P < 0.05, ** P < 0.01.
B = unstandardised beta co-effcient, β = standardised beta coeffcient.

Discussion

The aim of the present study was to Identification of the factors predicting the Stretching Exercise (SE) Behavior among Office employees with reinforcing and developing the performance of the Health Promotion Model (DHPM) in Shahid Beheshti University of Medical Sciences (SBUMS) of Iran. The results of the confirmatory factor analysis (CFA) indicate that the DHPM was fairly desirable and confirms the validity of the related instrument structure. Although the analysis HPM was also adequate, due to the achievement of better values in the indicators RMSEA, x2/df, NNFI and SRMR the DHPM somewhat in terms of fitting (and therefore of the construct validity) in the situation was better. These results are consistent with the results of the Öncü study (Öncü, Feltz, Lirgg, & Gürbüz, 2018). It should be noted that in the case of index x2/df there is no general agreement in determining the fitness of the model (Kenny, 2014). It also affects from the sample size (Sharma, Mukherjee, Kumar, & Dillon, 2005).

The results of the regression test and its comparison showed that the coverage of variance of the stretching exercise behavior was more than that in comparison with HPM, this result suggests a relative superiority DHPM to HPM and this finding is partly due to the presence of stimulus control. It could be said that one of the stimulus control roles, the controlling of various stimuli which triggers

undesirable and unwanted behaviors and its roles the response to stimuli (Cardinal & Kosma, 2004). Therefore, it could be concluded that the actuator stimulus control has been able to increase the prediction of this model. The results of this study repeat the results of a previous study (McEachan, Conner, Taylor, & Lawton, 2011).

Self-efficacy was the most influential predictors of accomplishing stretching exercise behavior consistent with Luszczynska results (Luszczynska & Schwarzer, 2003), Also in other studies, Self-efficacy was decided as influencing factors (McEachan, et al., 2011). Numerous studies have revealed perceived self-efficacy because of the best predictor variable for exercise. (Laffrey, 2000; Shin, Hur, Pender, Jang, & Kim, 2006; Wu & Pender, 2002).

Consequently, strategies for reinforcing self-efficacy should result in extra powerful health promotion educational for workplace employees (Laffrey, 2000; Pender et al., 2002; Vahedian Shahroodi, 2013).

On this study, the variables of perceived barriers with a negative relationship were demonstrated to be positive predictors for stretching exercise among office employees. This finding is supported by many previous researches which determined that individuals who perceived more obstacles to the performance of exercise are less probably to try this behavior (Manaf, 2013; Shin et al., 2006).

Pender (2015) focused on a perceived barrier as a critical mediator of the motivational readiness of individuals to developing a healthy behavior (Pender et al., 2015). In the present study, in order to enhance stretching exercise, there was a need to solve the perceived barriers which were predictive. In other studies (Alaviani et al., 2015; Chenary et al., 2016). According to this finding, a problem-solving technique for overcoming boundaries to physical interest ought to be taken into consideration in exercise intervention programs.

The Commitment to a plan of action in SE was measured using an 8-item scale in which each item stated one Commitment. Pender et al. stated that the Perceived Barriers to Action affect health-promoting behavior directly by serving as blocks to action as well as indirectly through decreasing commitment to a plan of action, The findings of this study show the beneficial effects of Commitment to a plan of action on stretching exercise (Gerber eta ., 2011; Sniehotta et al., 2005).

In the current study, there was also a relationship between interpersonal influences and stretching exercise. This result is consistent with previous studies (Alaviani et al., 2015; Roux et al., 2008). Previous studies have shown that interpersonal influences are related to the studied behavior (Alaviani et al., 2015).

This study shows the application of DHPM for similarly studies should be consideration workplace employees exercising. In this regard, DHPM-based totally stretching workout intervention packages ought to awareness greater on office employees perceived self-efficacy, perceived barriers, and Commitment to a plan of action as well as interpersonal influences and stimulus control. It could be said that to design and implement an educational program to adopt the behavior of stretching, use the DHPM.

Limitations

There are several barriers. First, the data used and were accumulated through self-report that could intervene in the results of this study. Moreover, the workplace employees were randomly selected, however, all of them got here from one college.

However, regardless of the restrictions described above, this study has to practice DHPM as a theoretical framework to predict the stretching exercise in office employees in Iran.

Conclusions

The present study is the first study to examine the three constructs Counter conditioning, Self-Regulation, and stimulus control in the development of health promotion model, especially the performance of tool constructs, fit and its predictive value.

Findings to furnish this reality that perceived barrier by means of the office employees may prevent them from engaging in stretching workout while being perceived self-efficacy, commitment to a course of action, interpersonal impacts, and stimulus control cause engaging in the exercises. Therefore, it could be cautioned that the right intervention primarily based on those predictors be designed to motivate the office personnel to do the exercises. But, doing more studies to make certain those effects are recommended.

Research limitations/implications: the data used were accumulated through self-report. Moreover, the workplace employees were randomly selected, however, all of them got here from one college. This study suggests that interrupting or reducing prolonged sitting with finding effective factors in stretching exercise and applying them to training can decrease musculoskeletal pain /disorders in desk workers.

Practical implications: All the participants gave informed written consents and expressed their willingness to participate actively in creating health programs in their workplace.

Social implications: This study shows the role of employees in shaping the physical and social health of the individual, society and health and safety through work-life stretching programs.

Originality/value: To design and implement educational programs in order to adoption the increase of SE behavior among office employers, the use of DHPM is more effective than the HPM.

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