



# Psychometric Evaluation of the Short Form of Commitment to a Plan of Action Scale for Stretching Exercise among the Office Employees Based on HPM

## ARTICLE INFO

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## ABSTRACT

**Aims** Commitment to a plan of action key factors is critical for stretching exercise predicting. However, commitment to a plan of action in stretching exercise across the throughout working conditions is far difficult in Iran; there is no measurement to evaluate commitment to a plan of action among workplace office employees. This study aimed at investigating the short form of confirmatory factor analysis commitment to a plan of action scale for stretching exercise predicting among based on health promotion model (HPM).

**Materials & Methods** Using multistage cluster sampling, 385 office employees from Shahid Beheshti University of Medical Sciences of Iran were selected through on a short form of commitment to a plan of action Scale. Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA) and Cronbach's alpha were also used.

**Findings** The mean age of the office employees was 39.4±7.76 years. CVI and CVR of each question were >0.7. The result of EFA confirmed one factor or component with the main component technique (commitment to a plan of action) with 71.8% cumulative variance and KMO was 87.2% (p<0.001). This was the good fit index in CFA. The reliability was also explanatory. In the area of CFA, the result showed REMSEA=0.046, GFI=0.907, AGFI=0.814, confirmed with Cronbach's alpha ( $\alpha$ =85.8%) and [ICC =0.74; 95% CI (0.62, 0.74)].

**Conclusion** This study approved the short form of commitment to a plan of action scale for stretching exercise. However, more advice is provided to ensure a reliable and valid tool for realizing stretching exercise behaviors.

**Keywords** Reliability and Validity; Exercise; Muscle; Skeletal; Public Health; Health Promotion

## CITATION LINKS

- [1] Workplace exercise and educational program for improving fitness outcomes related to health in workers: A randomized controlled trial
- [2] Acute effects of interrupting sitting on discomfort and alertness of office workers
- [3] Influence of muscle quality on the differences in strength from slow to fast velocities in career firefighters
- [4] Implication for office environment ergonomic intervention: a study of local government offices in Katsina state of Nigeria
- [5] Acute effects of stretching exercise on the soleus muscle of female aged rats
- [6] Association of self-reported aerobic physical activity, muscle-strengthening physical activity, and stretching behavior with presenteeism
- [7] Health promotion in nursing practice
- [8] Ten measurement commandments that often should be broken
- [9] Factors predicting the stretching exercise behaviors of the office employees working in the Shahid Beheshti University of Medical Sciences in Tehran, Iran
- [10] Designing and psychometric evaluation of Stretching Exercise Predicting Scale (SEPS)
- [11] The SCI Exercise Self-Efficacy Scale (ESES): Development and psychometric properties
- [12] Comparison of the original and revised structures of the Health Promotion Model in predicting construction workers' use of hearing protection
- [13] Physical activity levels in obese and non-obese women and their relationship with body mass index, perceived self-efficacy, perceived benefits and barriers of exercise, and commitment to a plan of action
- [14] Psychometric evaluation of the exercise self-efficacy scale among Korean adults with chronic diseases
- [15] Exercise combined with Acceptance and Commitment Therapy (ExACT) compared to a supervised exercise programme for adults with chronic pain: Study protocol for a randomised controlled trial
- [16] Clinical trial of tailored activity and eating newsletters with older rural women

## Introduction

Sedentary lifestyle is associated with major disorders in human health. Therefore, a healthy lifestyle, which includes regular stretching exercise in workplace, can significantly improve health [1].

Studies have validated that prolonged sitting will increase pain and stretching physical reduce soreness in workplace office workers sitting [2]. The improvement in muscular strength, endurance, and flexibility can diminish the risk of musculoskeletal issues and accelerate muscular endurance extremely [3]. Work safety and health care troubles each International and neighbourhood difficulty as work-related musculoskeletal disorders [4].

Studies have shown that stretching physical can improve the range of motion, flexibility, torque, balance, fitness or well-being, and independence [5].

Commitment to a plan of action key factors is critical for stretching exercise predicting. Promoting muscle-strengthening physical activity (PA) and stretching behavior among office employees is a key health behavior for focused on associated work. The poor health of office employees influences the cost of medical care and lost productivity. Those behaviors are prompted to the state of private health, commitment to the action a plan, interpersonal effects, and barriers [6].

Muscle-strengthening's PA model indicates that engagement in the regular workout is dependent on the interactions of office employees and a commitment to a plan of action. To results of stretching behavior offered the office employees, who take part in 1-2 days of stretching, had lower odds for any work restrictions. Previous studies have reported that odds for services are 1.4 to 2.3 times higher for inactive participants than stretching exercises participants [7].

Therefore, workplace interventions that provide physical exercise during work hours with colleagues reduce the problem of lack of time, lack of commitment to a plan of action and may reach employee's beings with much less motivation for physical workout. Providing relaxation and muscular strength and enhancing knowledge about physical exercises and the impact of lifestyle sitting under health must be part of the goals of study at the workplace [1].

Commitment to a plan of action is defined as cognitions concerning the behaviors, beliefs, or attitudes of others [7]. Also, commitment to a plan of action to promote health is one of the important constructs of the health promotion model (HPM). The HPM proposes that commitment to a plan of action has an effect on health-promoting behavior directly to commit to a plan of action [7].

However, committing to a practical stretching exercise program in the workplace is very difficult. There is no measure in Iran to evaluate the commitment to an action plan among workplace

employees.

Efforts have been made to enhance the knowledge of main and primary factors of commitment to a plan of action in educational interventions to increase stretching exercise workout. However, there has not been a commitment to a plan of action to increase stretching exercise among office employees.

The Persian version of the instrument had no bias in comparison with the English version to approve the short form of commitment to a plan of action scale for stretching exercise.

The aim of this study was to analyse the psychometricity of the short form commitment to a plan of action sports stretch for predicting HPM improvements.

## Materials and Methods

The current cross-sectional study was conducted from June 2017 to August 2018. This study is a part of a Ph.D. thesis and the Ethics Committee of Tarbiat Modares University has approved it. All the office employees gave informed written consents with Ethics Committee code (IR.TMU.REC.1395.329).

**Sampling method and sample size:** 385 office employees of 10 health networks were recruited within the Shahid Beheshti University of Medical Sciences of Iran (SBUMS), using a multistage cluster sampling. A sample of 385 office employees turned into anticipated for exploratory aspect analysis (EFA) on the rule of 5 individuals for each object ( $77 \times 5$ ) [8]. As a result, 385 questionnaires were completed, 362 of which were finished.

**Inclusion/Exclusion Criteria:** Inclusion criteria were working in the SBUMS as an office employee, working with computer as their task, and excluding criteria were unconventional criteria suffer from any disability or illness that prevents stretching exercises.

**The Questionnaire:** In the current study, two questionnaires were applied. The first was about demographic characteristics of the studied participants (Table 1) and the second one was a 5-Likert scale, HPM-based questionnaire for exercise developed by Pender *et al* [7]. The short form scale includes only 8 items. In the current study, the short form was applied. One of these questions was "For engaging in stretching exercise, I reward myself". These questions were answered through 4-Likert scale from "never" to "always" in a range of 1 to 4. Therefore, the total score was from 8 to 32 points, and the higher score showed better status.

**Data Collection:** Within the present study, the data were gathered with the aid of office employees at their health networks. The present study evaluates the validity of previous dedication studies to a subscale measure [9].

**Content Validity:** To assess content validity, a collection of experts, which including 6 health education and health promotion specialists and 2

psychologists, a psychometric, a physiotherapist and a nursing manager or instructor on pain management, a neurological pain director, an orthopaedist, and a physical medicine expert evaluated the questionnaire for wording style. The significance of items and scaling were checked. Thus, some minor modifications were made.

**Face Validity:** The face validity of this instrument was reviewed by 30 office employees to make sure that they understood the questions and it was easy to respond to them. This sample was changed into eliminated from the original study.

**Construct Validity:** Within the present study, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used. Cumulative variance (CV) > 0.4 and Kaiser-Meyer-Olkin (KMO) > 0.7 were considered as suitable fit indices in EFA; and REMSEA < 0.05, GFI > 0.9, AGFI > 0.9, P value > 0.05 were considered as suitable fit in EFA.

**Reliability:** Cronbach's alpha ( $\alpha$ ) > 0.79 was taken into consideration as suitable index for reliability. In other words, the Cronbach's alpha is: ( $\alpha$ =83.4%) and [ICC=0.79; 95% CI (0.58, 0.84)].

**Ethical Issues:** In this study, all ethical principles were considered. The Ethics Committee at Tarbiat Modares University authorized the observe protocol. Consent was taken from all office workers.

**Statistical Analysis:** All statistical facts were performed with SPSS16 and AMOS22. To evaluate this variable, with mean  $\pm$  standard deviation (SD) was used to assess this variable. The t-test was used to compare the two groups. Kolmogorov-Smirnov test was used to evaluate the normal distribution of variables.

**Table 1)** Demographic variables of the studied office employees

Variable	No. (%)
<b>Age</b>	
≤25	35 (9.7)
26-30	44 (12.2)
31-35	117 (32.3)
>35	166 (45.8)
<b>Marital status</b>	
Single	140 (38.7)
Married	222 (61.33)
<b>Educational level</b>	
Under<14	76 (21)
Bachelor=16	166 (45.8)
Upper Bachelor>18	120 (33.2)
<b>Work experience</b>	
≤5 years	120 ( 45.7)
5-10 years	42 (15.9)
11-15 years	49 (18.6)
16-20 years	43 (16.4)
≥20	9 (3.4)

## Findings

The mean age of the 362 office employees was 39.4 $\pm$ 7.76 years. The most of office employees age had a 31-35 years with 117 (32.3) and had work

experience  $\leq$  5 years with 120 (45.7). Content Validity Index (CVI) and Content Validity Ratio (CVR) of each question were >0.7. The result of EFA with principal component approach showed one factor (commitment to a plan of action) with 71.8% cumulative variance and KMO was 87.2% ( $p < 0.001$ ). This was the good fit index in CFA. The reliability was also explanatory. In the area of CFA, the result showed REMSEA=0.046, GFI=0.906, AGFI=0.814, confirmed with Cronbach's alpha ( $\alpha$ =85.8%) and [ICC=0.74; 95% CI (0.62, 0.74)] (Table 2 and Figure 1).

Eventually, predictive validity was used to validate the commitment to a plan of action as a predictor factor for stretching exercise, which showed a positive and significant relationship ( $p < 0.001$ ). Due to the significance of this variable, good predictive validity was considered. Those values, with appreciation to the CR index, were very reliable. Reliability was also confirmed by Cronbach's alpha.

**Table 2)** Regression weight extracted from EFA and CFA in addition to validity and reliability goodness of fit index

Question	Item Weight Based on EFA	Item Weight Based on CFA
I consider certain times in a weekly timetable for stretching (1.Never; 2.Sometimes; 3.Often; 4. Always)	<b>B</b>	<b>B (T Value)</b>
In a comfortable place, I do stretching exercises.	0.72	0.54(7.48)
I reward myself for doing stretching exercise.	0.69	0.56(7.34)
I sometimes change the stretching strategy to prevent tiredness and duplication.	0.62	0.67(7.67)
I try to gradually change the amount and intensity of stretching.	0.68	0.68(8.14)
I try to get acquainted with my acquaintances and friends about how I do tension strength.	0.72	0.64(7.56)
I enable the software to perform stretching on my computer, which reminds me to do stretching.	0.73	0.55(7.28)
I encourage my friends to do stretching.	0.68	0.69(8.34)
EFA Goodness of Fit Index: KMO=87.2%; % Cumulative of Variance=71.8%		
CFA Goodness of Fit Index: REMSEA=0.046; GFI=0.907, AGFI=0.814; $p < 0.001$		
Range of Cronbach's alpha=0.85.8 % ( 0.62, 0.74%)		
ICC =0.74 95% CI		

CFA: confirmatory factor analysis; EFA: exploratory factor analysis; KMO: the Kaiser-Meyer-Olkin; EFA goodness of fit index: KMO=90%;  $\chi^2/df=1.5$ ;  $p > 0.03$ ; CFA goodness of fit index: REMSEA=0.08; GFI=0.9, AGFI=0.80;  $p < 0.05$

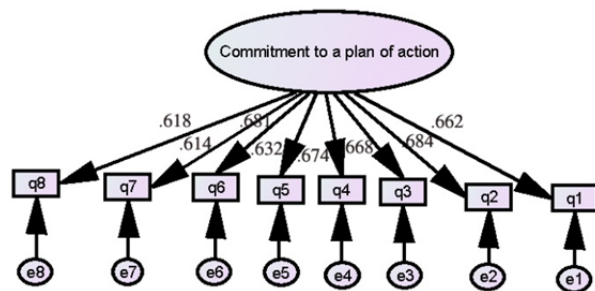


Figure 1) Model path using confirmatory factor analysis

## Discussion

The current study evaluated the reliability and validity of the commitment to a plan of action subscales among office employees. The results of the present study showed that the commitment to a plan of action subscale was a valid/reliable instrument, which could be used to measure commitment to a plan of action regarding stretching exercise among office employees.

Further, this measure can assess why office employees in formal workforce can do stretching exercise, while they actually intend to do this.

In other words, according to the HPM, based on CFA analysis, all 8 items of commitment to a plan of action scale were verified in the target group.

The psychometric assessment of the commitment to a plan of action on this study confirmed that this scale was a valid and reliable instrument for measuring commitment to a plan of action for stretching exercise among Iranian office employees; the result was consistent with other previous studies [10].

Moreover, the results of other studies such as that of Kroll *et al.* and Ronis *et al.* supported the results of the current study, so that they had a reliable instrument with high internal consistency and scale integrity [11-12]. But, the difference seen in the Kroll *et al.*'s study is limited. It is unclear doubtful whether the self-efficacy instrument correlates with measures exercise and physical activity. The commitment to a plan of action structure is a commitment to carry out a specific training or exercise plan at a given time and plan with particular individuals or alone, regardless of competing preferences and the identification of definitive strategies for eliciting, carrying out, and reinforcing the behavior of exercise [13].

In a study performed by Shin *et al.*, the commitment to physical activity structure with a Cronbach's alpha, difference of about 5% was confirmed [14]. It means that the procedures of psychometric evaluation in the current study were consistent with previous evidence, in which the authors tried to validate the commitment to physical activity scale [15]. The results of the current study confirmed high internal reliability that was consistent with previous studies of Walker [16].

Due to the decrease in question items and the increase of the point scale in this study, compared with Shin's *et al.* study [14] point scale, a better ranking has occurred with fewer questions.

Due to the methodological difference, compared to Shin *et al.*, [14] which relies on split-half methods to determine the instrument stability, reliable estimates have been criticized due to the multiple ways; the two halves can be formed based on the set of items. A future test-retest examination is, therefore, desirable. Therefore, the present study has used separate sampling.

The prediction of exercise strength behavior in the structure of commitment to a plan of exercise was better than the study conducted by Lange, which was 58%, and in the present study, it was 71% [13].

Therefore, the current study verified that the commitment to a plan of action scale was an effective measurement to distinguish the office employees for stretching exercise.

Despite the strong points of the present study, there were a few limitations; for example, for the first time, the data used in this study were collected through a report that might interfere the results of this study. Similarly, the employees of the workplace of this study were randomly selected, but they all came from a university and the findings could not be generalized to all Iranian office employees. EFA within the present study was not the main finding; consequently, it was reported just for comparison with CFA.

In spite of all of the limitations stated, the consequences of this study were supported by way of different evidences. Nonetheless, the findings of the present study suggest that this instrument may be used to measure behavioral changes for stretching exercise among office employees, who change their behavior. However, studies in the future with a larger sample size, which include different subgroups, are strongly recommended.

## Conclusion

The present study confirms the short form commitment to a plan of action scale for stretching exercise among office employees. But, similar studies are recommended to ensure a valid and reliable instrument to realize stretching exercise behaviors.

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**Ethical Permissions:** IR.TMU.REC.1395.329.

**Conflict of Interests:** There is no conflict of interest.

**Authors' contribution:** M H D: Performed all study and had complete access to all the data for analysis. He confirmed the eligibility of the office employees for the study. He was involved in drafting the article.

SST and AK: Supervised the whole study and approved a final version of the manuscript.

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## References

- 1- Vilela BL, Benedito Silva AA, de Lira CA, Andrade Mdos S. Workplace exercise and educational program for improving fitness outcomes related to health in workers: A randomized controlled trial. *J Occup Environ Med.* 2015;57(3):235-40.
- 2- Benzo RM, Kruse NT, Hughes WE, Casey DP, Carr LJ. Acute effects of interrupting sitting on discomfort and alertness of office workers. *J Occup Environ Med.* 2018;60(9):804-9.
- 3- Gerstner GR, Giuliani HK, Mota JA, Ryan ED. Influence of muscle quality on the differences in strength from slow to fast velocities in career firefighters. *J Strength Cond Res.* 2018;32(10):2982-6.
- 4- Gambo A. Implication for office environment ergonomic intervention: A study of local government offices in Katsina state of Nigeria [Dissertation]. Parit Raja: Universiti Tun Hussein Onn Malaysia; 2017.
- 5- Zotz TG, Capriglione LG, Zotz R, Noronha L, Viola De Azevedo ML, Fiuza Martins HR, et al. Acute effects of stretching exercise on the soleus muscle of female aged rats. *Acta Histochem.* 2016;118(1):1-9
- 6- Walker TJ, Tullar JM, Diamond PM, Kohl HW, Amick BC. Association of self-reported aerobic physical activity, muscle-strengthening physical activity, and stretching behavior with presenteeism. *J Occup Environ Med.* 2017;59(5):474-9.
- 7- Pender NJ, Murdaugh CL, Parsons MA. Health promotion in nursing practice. 8<sup>th</sup> Edition. Pearson Prentice: Hall; 2019.

- 8- Knapp TR, Brown JK. Ten measurement commandments that often should be broken. *Res Nurs Health.* 1995;18(5):465-9.
- 9- Delshad M, Tavafian S, Kazemnejad A. Factors predicting the stretching exercise behaviors of the office employees working in the Shahid Beheshti University of Medical Sciences in Tehran, Iran. *Rev Inves Clin.* In press; 2019.
- 10- Delshad M, Tavafian S, Kazemnejad A. Designing and psychometric evaluation of Stretching Exercise Predicting Scale (SEPS). *J Korean Acad Nurs.* In press; 2019.
- 11- Kroll T, Kehn M, Ho PS, Groah S. The SCI Exercise Self-Efficacy Scale (ESES): Development and psychometric properties. *Int J Behav Nutr Phys Act.* 2007;4:34.
- 12- Ronis DL, Hong O, Lusk SL. Comparison of the original and revised structures of the Health Promotion Model in predicting construction workers' use of hearing protection. *Res Nurs Health.* 2006;29(1):3-17.
- 13- Lange R. Physical activity levels in obese and non-obese women and their relationship with body mass index, perceived self-efficacy, perceived benefits and barriers of exercise, and commitment to a plan of action [Dissertation]. Detroit MI: Wayne State University; 2010.
- 14- Shin Y, Jang H, Pender NJ. Psychometric evaluation of the exercise self-efficacy scale among Korean adults with chronic diseases. *Res Nurs Health.* 2001;24(1):68-76.
- 15- Casey MB, Smart K, Segurado R, Hearty C, Gopal H, Lowry D, et al. Exercise combined with Acceptance and Commitment Therapy (ExACT) compared to a supervised exercise programme for adults with chronic pain: Study protocol for a randomised controlled trial. *Trials.* 2018;19:194.
- 16- Walker SN, Pullen CH, Boeckner L, Hageman PA, Hertzog M, Oberdorfer MK, et al. Clinical trial of tailored activity and eating newsletters with older rural women. *Nurs Res.* 2009;58(2):74-85.