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Using Theoretical Domains Framework for Exploring Appropriate Sitting Posture Determinants Among Office Workers: A Content Analysis Study

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Abstract

Background: Sedentary occupations frequently expose employees to prolonged periods with poor posture, which has been considered as the cause of musculoskeletal disorder.
Objectives: The study set out to identify the related factors of a taking healthy sitting posture in office workers.
Methods: This qualitative study aimed to use the theoretical domains framework (TDF) to investigate perceived determinants to taking a proper sitting posture in office workers. Semi-structured interviews with 25 office workers according to purposive sampling was conducted with a convenience sample of university office workers in Iran. Recorded interviews were transcribed into MAXQDA version 10. Directed content analysis and framework analysis were used for drawing the 12 domains of the TDF.
Results: Explored themes were mapped onto the TDF domains, including skills, knowledge, behavioral regulation, goals, environmental context and resources, social influences, beliefs about capability, intentions, emotion, beliefs about consequences, memory, and attention and reinforcement.
Conclusions: This study is a theoretical starting point in making structured interventions to change improper sitting posture among office workers. Also, the identified factors provide organizational managers with a wide list of factors by which they can encourage their employees to use proper postures in the workplace, leading to a significant reduction in job absenteeism and insurance fees associated with health problems. In addition, this study enriches the literature by providing additional empirical evidence for the TDF theory.

Keywords: Sitting Posture, Theoretical Domain Framework, Office Worker

1. Background

Studies revealed that employees sit more than 8 hours per day in their working place (1). The long sitting time may cause health-related problems for the employees (2, 3). This situation can be further detrimental when employees do not use a healthy posture for sitting during the long working time (4). Up to now, several studies have investigated the diseases associated with extended sitting posture (1). Sitting in an awkward posture in prolonged sitting time may cause spinal or musculoskeletal disorders (1, 5-8). Musculoskeletal disorders (MSDs) have been recognized as the most common deriders associated with sitting for long periods (9). MSDs have been defined as muscular pain or injuries to the human support system (10). MSDs are among the leading causes of occupational health problems, imposing burdens for workers, employers, and society (11, 12). Particularly, 25% - 51% of office workers who sit for a long time suffer from low back pain (LBP) (1, 13), and neck (41.6%), and shoulders (40.6%) (13) symptoms, which are the most common symptoms of MSD. Hence, among all work-related complications, MSDs may be considered as a prevalent disease in the worksite (14). The MSDs are not limited to western countries, and our investigation shows that they are also common among office workers in Iran (12, 15, 16). According to a systematic review conducted among Iranian workers, LBP is highly observed in middle-aged patients (17), which is the most productive period of working life for a worker (17, 18). Employees are among occupational groups who have internationally been found

with relatively high rates of MSDs (19). A recent study on workers with MSDs revealed a decrease in the quality of life score by 31% among them (20).

The mechanisms causing work-related musculoskeletal pain are multi-factorial (21). This complaint can be attributed to numerous risk factors, including a workstation, repetitive movements, long sitting hours, psychological factors, and posture. In the meantime, improper posture acts as a key factor leading to the incidence of MSD (22-25). Poor sitting posture in the workplace (e.g., leaning forward causes upper limb and neck pain) not only influences the personal life and productivity of a worker but also causes significant burdens on the health system (26). On the contrary, studies have shown that correct sitting posture has positive effects on the musculoskeletal system, leading to a reduction in occupational accidents in the workplace (27, 28). Nonetheless, working with prolonged fixed and awkward postures is an inherent part of some jobs (29).

Although some research has been carried out on improper posture (30-32), there is no study on determinants of this behavior among employees. For investigating the determinants of poor sitting posture, both physical and psychosocial factors should be considered to identify perceived determinants of behavior and barriers to a proper sitting posture in office workers before developing effective interventions (23). Most studies have tended to focus on diseases rather than finding factors related to behavior. Thus, the question is that why some employees take a healthy sitting posture and other do not. Preliminarily, Michie et al. (33) expanded a framework taken from 33 commonly used behavioral theories and 128 psychological constructs named the theoretical domain framework (TDF) for identifying the determinants of behavior and barriers to behavior change. The current available theoretical foundations show that still little is known about the underlying mechanism, which can explain the extent to which improper sitting posture can result in various negative outcomes (34-38). Besides, recent studies have used the TDF to develop behavior change interventions in various contexts (38-40), but his behavior has not yet been applied in relation to improper sitting posture among employees.

2. Objectives

Therefore, this study used this comprehensive framework to identify enablers and barriers for taking a healthy posture in the offices from the employees' point of view.

3. Methods

3.1. Design

This study was done using qualitative semi-structured interviews with office workers between May and June 2019. Purposively selected participants from health care systems, and universities were recruited to participate in an interview. Inclusion criteria were at least working for 2 years in one of the hospitals, health care systems, or university office and willingness to share views.

One of the reasech team members (PH) contacted each of the participants to clarify objectives and study questions, and after obtaining the agreement of the participant, the interview was carried out. A topic guide with reference to a TDF framework was developed by team members with extensive experience in health services that directed semi-structured interviews. Interventions through interviews using TDF-based guides conducted at the workplace are highly successful if they address multiple influences on behavior, including individual, interpersonal, and organizational factors. The researcher conducted interviews at times most convenient for the participants in their workplace for piloting, and two interviews were done with two office workers at Shahid Beheshti University of Medical Sciences. Interviews lasted 18 - 30 minutes. Open-ended questions facilitated exploration of workers; views regarding proper sitting posture which was salient to the interviewees. Interviews were continued until data saturation. When no new code was produced in the last three interviews, data collection was stopped. Key questions were asked from all participants related to taking a healthy posture in their workplace; for example, regarding the working environment, it was asked that how does your work environment influences your sitting posture? After transcribing the interviews, an email or letter was sent to the participants, and they were asked to confirm the interview text and sign it.

3.2. Ethics

This study is part of a PhD thesis in health education and promotion, which was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences (code: IR.SBMU.PHNS.REC.1397.038). Before interviews, the interviewer tried to make a good relationship with the participants by clarifying the purpose of the study. Participants were confident not only about the confidentiality of their names but also about the reasons for being selected.

3.3. Data Analysis

All interviews were transcribed verbatim, coded, and then analyzed using the method suggested by Hsieh and

Shannon (2005), in which the textual data are read, and those parts of the text that on the first impression appear to be related to the predetermined codes are highlighted and are coded using the predetermined codes.

According to directed content analysis, phrases and sentences that referred to determinants of the sitting posture in the workplace were identified and mapped to the TDF domains.

To ensure the credibility of the finding, sufficient time was allocated to collect data; also, we collected data from different people involved with the topic. For external checking, two colleagues who were experienced in qualitative research investigated data and based on their feedback, domains were reviewed (41). To ensure the transformability of findings, a description of the characteristics of participants and the methods and stages of data collection and analysis, along with the examples of participations' statements, were prepared.

4. Results

4.1. Characteristic of Participants

Among 30 office workers invited to the interview, 25 cases accepted, and 5 workers rejected participation in the study. The age range of workers was 30 - 45 years (mean, 39.8 $\pm$ 9.7 years). Ten out of the 25 participants were university employees, while the remaining were from the healthcare system. The work experience of the participants ranged from 5 to 28 years.

4.1.1. Core Theme-Determinants of Taking a Healthy Sitting Posture in the Workplace (TDF Constructs)

The explored themes were mapped to 11 constructs of TDF (skills, knowledge, beliefs about outcomes, environmental context and resources, memory and attention, beliefs about capability, goals, social influences, emotion, reinforcement, intentions, and behavioral regulation). Some of the TDF constructs, which were not relevant to the context of healthy posture among employees were optimism, social/professional role, and identity. The identified determinants according to TDF domains are displayed in Figure 1.

4.2. Key Domains

4.2.1. Skill

In terms of the construct of "having skill about taking proper posture" cases participated in the interview stated that skill is the key factor in doing a behavior. An employee declared that "Certainly, such behavior (proper posture)should be practiced much enough so that, it would be possible for a person to put it in the treasure of his behavior" (interview no.: 3)."The employee should learn skill of any behavior" (interview no.: 4).

Furthermore, an employee, who had a problem in having proper posture, described his situation in the office as follows: "the problem with this behavior is that I really have never received practical education for doing that so, I think I have not enough skill for taking proper posture" (interview no.: 19).

4.2.2. Lack of Knowledge

Lack of knowledge was another barrier among employees. "To be honest, I'm not alerted about what principle a clerk should do because nobody has told us about the kind of things that we should perform" (interview no.: 1).

Furthermore, workers emphasized the importance of awareness in doing a behavior. "In this context, there is also a need for awareness of the knowledge and the knowledge possessed by a person about his or her own health, how to get better, or how to deal with it badly" (interview no.: 7).

4.3. Beliefs About Consequences

In terms of "beliefs about consequences", participants commented on many positive and negative consequences as a result of taking a proper posture.

Positive outcomes of a proper posture mostly reported by the workers included reducing fatigue and stress, preventing MSDs, improving the quality of life in worksite, increasing self-esteem, and job performance. Some participants stated:

"Sitting in right position gives me confidence". Another one who has a good sitting posture feels that "With proper posture, minimum advantage is having less fatigue in the work environment" (interview no.: 11). "The most important consequence is that, we can prevent musculoskeletal disorder in long time" (interview no.: 25).

4.4. Environmental Context and Resources

According to this construct, every situation, or environment that can be an obstacle or encouraging for developing skills, independence, social competence, and behavior is described as environmental context and resources.

Several statements were related to this domain; participants not only complained about ergonomic furniture in their workplace but also discussed an organizational atmosphere and obstacles in the organization. "Our manager believes that, he is responsible about existence of healthy atmosphere in the office thus, in this regard, among organizational courses, he also has designed health-based courses for us in the office" (interview no.:

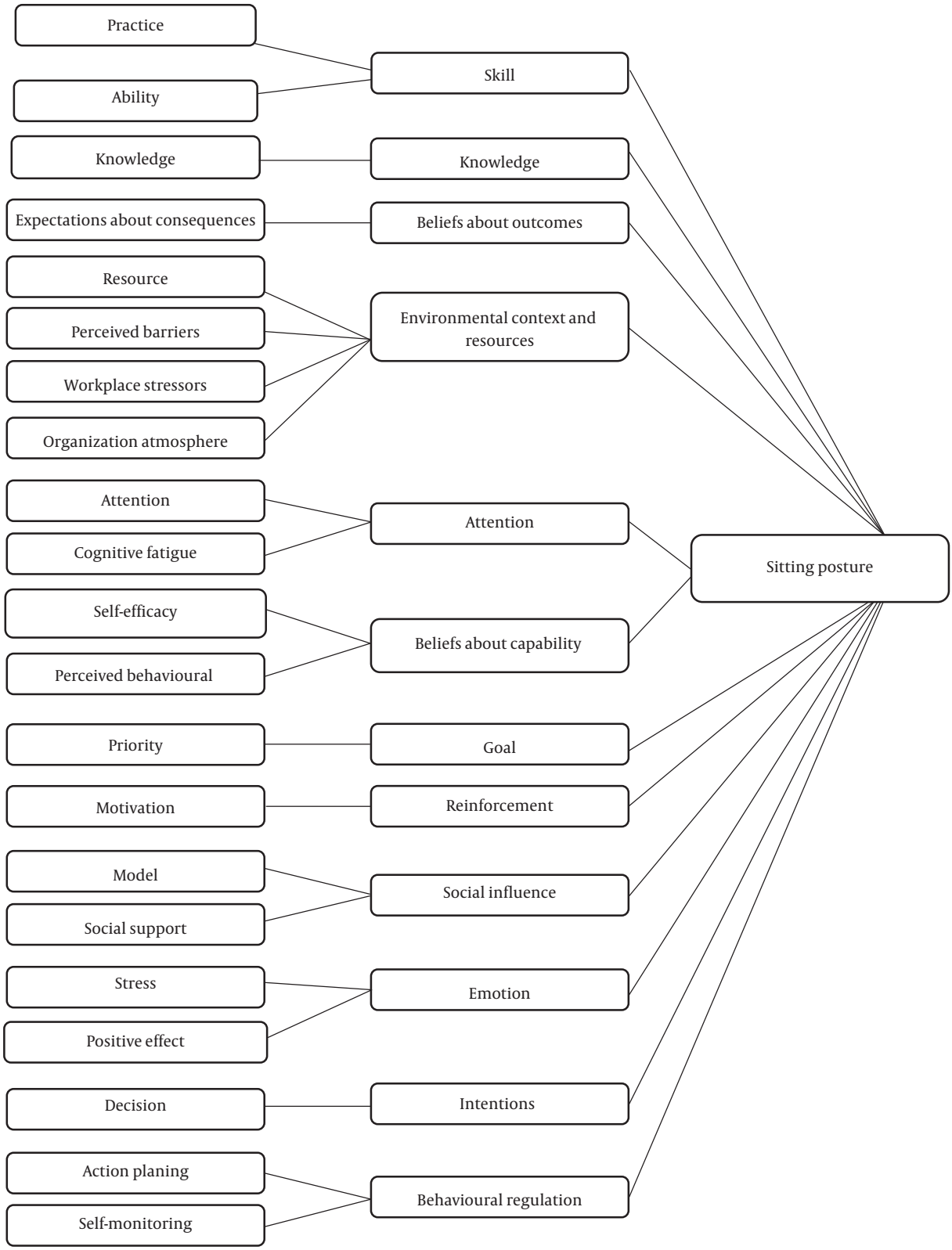

Figure 1. Identified determinants according to the theoretical domains framework (TDF) Constructs

16)."To be honest, we have good furniture available for us in the workplace" (interview no.: 13)"The manager considers us as a vulnerable resource so, we easily ask for everything that we need (interview no.: 17)".

4.5. Memory and Attention

It was a common view among the participants (clerks) that "they do not pay attention to their sitting in proper posture if someone doesn't say that you have not proper posture" (interview no.: 15). Another common thought repeated by participants was that "task overload can cause forgetting of proper posture during worktimes" (Interview no.: 26). Another participant said that "Forget to take proper posture because of being focused on work-task".

4.6. Beliefs About Capability

Some participants described that "it is difficult for us to have a proper sitting posture, so we aren't capable to do it". In this type of beliefs, self-efficacy, perceived behavioral control, and self-esteem are more important notions mostly reported by the interviewer.

"I'm sure not only in normal situation but also in the presence of stress; I'm able to take proper posture in worksite" (Interview no.: 13)"I should say that, taking proper posture during working isn't easy for me, but it is under my control, if I want, I can do it" (interview no.: 30).

4.7. Goals

Several participants believed that sometimes, this behavior is "less important for them across other health problems".

Most of the participants neglected this behavior in difficult situations indicating that this crucial factor in preventing MSD has not been highlighted enough among workers.

4.8. Reinforcement

The participants emphasized the importance of reinforcement in doing and also improving sitting posture. One of occupational health office workers said that "which organization has this policy that whoever has a healthy behaviour among other employees, needs to be appreciated by the organization? Organizations can reinforce this behaviour easily" (Interview no.: 20).

A clerk said that "I receive others' appreciate when I take a proper sitting posture while I'm doing my tasks" (Interview no.: 22).

4.9. Social Influences

This domain refers to the interactive behavior between individuals so that they can change each other's behavior, thinking, and emotion. For example, one participant explained her observation, "my husband believes that I should observe proper posture while working so as to remain healthy" (interview no.: 17).

Another interviewee stated that "existence of a good model who observed proper posture motivated me to have a proper posture".

4.10. Emotion

The participants reported that emotions can lead to a proper sitting posture. For example, one interviewee said that "you can't imagine how my emotion can influence my behavior during working; I have a good mental emotion while I'm sitting in proper position" (Interview no.: 14).

Also, one of the participants declared that "when I imagine myself with straight body position in next years, I become motivated to maintain my straight position" (Interview no.: 19).

4.11. Intention

Intention was mentioned by most clerks during the interview. For instance, one employee said: "I know taking proper sitting posture is good for me, but I postponed performing it, because I little knew about its importance" (Interview no.: 20)."Actually, I'm a little lazy regarding following a healthy behavior, whenever I decided to do a healthy behavior, although I had it in my mind, unfortunately, I called it off after a time" (Interview no.: 22).

4.12. Behavioral Regulation

Behavioral regulation was a common theme repeatedly mentioned. Breaking habitual behavior is not easy enough to overcome. In this case, planning and self-regulation for changing behavior were crucial factors as declared by everyone.

One employee said that "I get used to sit with improper sitting posture, but henceforth, I try to improve this behavior" (Interview no.: 15).

Another participant who had not a good posture declared that "I intended to have planning for healthy behavior exactly for proper posture that influenced my body" (Interview no.: 16).

These results provide important insights into taking healthy posture among university employees.

5. Discussion

Office workers are known to be at high risk of MSDs (42). Being in a sitting posture for long hours can develop musculoskeletal symptoms of the waist, neck, shoulders, hands, and fingers (20, 43, 44).

Hence, the present study was conducted to identify the factors influencing sitting healthy posture among office employees. As mentioned earlier, we undertook this study according to the TDF framework, which is used primarily in healthcare settings to investigate the factors influencing clinical behavior in order to design interventions to improve public and occupational health (45).

Identified domains were supported by at least three individual quotations. According to TDF framework, knowledge was the first domain that was questioned. It is important to note that knowledge was mentioned several times by the workers. It is the basis of an intention and whether an intention is translated into action (46).

According to previous studies, although knowledge is necessary for taking suitable posture (14, 47-50), it is not sufficient for doing a behavior; thus, we discussed other determinants, like skill. As stated by Mohammadi Zeydi et al. (50, 51), we found the importance of knowledge and skill in adapting ergonomic principles in the worksite.

Furthermore, behavior change can be influenced by the expected consequences of the target behavior. According to the health behavior goal model and social cognitive theory, perceived health costs and benefits and also perceived emotional costs and benefits are core parts of outcome expectancy. Cognitive, emotional, and behavioral outcomes related to the future are classified into this domain.

Participants frequently referred to the health benefits of healthy sitting posture. Also, they mentioned that an upright sitting posture increases their self-esteem (52). For changing behavior, a person must consider that his current behavior will have a negative effect on his health, and changing it has health benefits (33), which is consistent with previous findings (53).

Current health problems and treatment intensity may also be related to psychosocial factors (54). Attitudinal influences arise from the provision of information by the schools, mass media, religion, and other people. People obtain information on health and health-related behavior, shaping their health-related knowledge, and health-related values, which along with expectations about the consequences of health-related behavior and evaluations of consequences shape attitudes towards health-related behavior contribute to making decisions about engaging in health-related behavior (33). Also, according to the theory of social change and the theory of triadic influence, social influences are effective in changing behavior.

The emotion was another factor mentioned by the workers. In this study, positive and negative effects and also anxiety were highlighted frequently. Previous studies have revealed that job burnout and emotional fatigue, and safe climate at the workplace were the most important determinants in the incidence of work -related MSDs (55-57). Also, studies have confirmed that an upright sitting posture compared with a slumped posture may result in less negative and more positive emotions (52), maintaining self-esteem, and reducing negative and increasing positive mood (52). Negative emotional states are associated with a stooped body posture (41, 58-60). Prior studies have suggested significant associations between MSD complaints and physical (61-) and psychosocial (64-67) factors of the work environment. Materials and resources were other barriers that frequently were mentioned in the interviews. This factor was widely discussed in the TDF framework; thus, we discuss it in detail. Workplace stressors named psychosocial factors are among the most important components affecting the health and safety of a workplace (68). Perceived barriers as one of core constructs of the transtheoretical model (TTM) in the resource category include the lack of ergonomic furniture, organizational atmosphere, environmental stressors, and environmental barriers. In some studies, using proper furniture along with education has been found to decrease the intensity of MSDs (48, 69).

In some studies, psychological factors have been mentioned as risk factors for work-related musculoskeletal disorders (WRMDs) (70, 71); for example, work stress not only causes backward posture but also leads to WRMDs (72). In addition, the management of the organization, especially its workers with a high level of responsibilities, has an important role in leading workers toward having healthy behavior. The manager acts as a model in the worksite so that he/she can boost workers' healthy behavior. Health-promoting leadership can affect employees' health, which can also be achieved by changing working conditions. Thus, managers are responsible for the employee's health (73).

According to the theory of the triadic influence model and health action process approach model, self-efficacy has a crucial effect on doing a behavior. This term is the fourth component in TDF as beliefs about ability. Self-efficacy has been reported in many theories, such as self-efficacy theory, health belief model, health promotion model, I-change model. Several studies have shown that perceptions of a person's ability to do a targeted behavior is an important factor in doing that behavior (74, 75) and increasing self-efficacy, which leads to overcoming barriers for doing the behavior (76). It seems that perceived self-

efficacy can be helpful for designing educational programs aimed at improving proper posture among clerks. Some participants declared that taking a healthy posture is difficult for them to show perceived behavioral control among employees. According to the theory of planned behavior (TPB), individuals have different beliefs about behavior, ranging from easy to difficult. The employee's beliefs can affect the perception of the advantages of having proper posture and evaluation of the outcomes of improper posture along with perceived beliefs about effectual feasibility of the behavior regardless of existing environmental obstacles and having confidence about the ability for having suitable posture (23). Behavioral control is considered as being able to perform a specific type of behavior. Consistent with our study, perceived behavioral control in some previous studies has been mentioned as a strong predictor of behavior (77, 78). Also, there is a direct relationship between taking proper posture and perceived behavioral control (79). However, Abedi et al. (80), in a study, found no relationship between these two factors.

The goal was another category that was discussed by the participants. Interviewees said that in some cases, they do not consider a priority for this behavior against health problems. When the targeted change is compatible with a person's personal goal structure, the health behavior change is most probable to happen as mentioned in the health behavior goal model. Besides, the personal goal structure consists of higher-order goals. Higher-order goals include goals related to health (e.g. to stay healthy), wellbeing (e.g. to enjoy life to the fullest), personal growth (e.g. to develop talents), and social goals (e.g. to be a good father) (33). The effects of goal in behavior change in different fields have been mentioned (81-83).

As explained in the TDF definition, memory shapes other parts of this framework. In response to interview questions, most participants stated that cognitive fatigue and attention are remarkable elements in taking a healthy posture. For cognitive control, inhibition can be conceptualized as a procedure that blockes the extension of activation and maintenance of the focus on the task at hand (84). Among postures, various levels of autonomic activation provide differences in mental fatigue (85). Exhaustion of (bodily or mental) resources may cause fatigue while carrying out a task (86). In general, evidence suggests that individuals become more tired (87-89) and fall asleep earlier (90) when they are in a lying position compared with an upright posture.

TTM was developed to describe behavioral intention. As some participants declared that they think about changing this behavior, but they postpone it, we used this category for describing this statement. Furthermore, behavioral intention is the most important determinant of individual behavior, according to TPB (80). Abedi et al. (80) introduced behavioral intention as the only predictor of taking correct posture among the nurses. There was a significant link between the constructs of TPB and MSDs among the nurses so that when people with a history of MSD in each organ were compared with people who did not have this problem, they showed lower levels of subjective norm, attitude, perceived behavioral control, and behavioral intention for taking correct body positions at work (91).

The probability of carrying out an action is determined by three factors: (1) Strengthening of the good habits for carrying out the action (reflected by the time spent by a person who has previously performed that task); (2) strengthening of behavioral intention to carry out the action; and (3) the existence of conditions facilitating the performance of the action. The probability of carrying out an action is proportional to the strengthening of good habits and intention. Also, self-monitoring in this category is a process involving self-observation and self-control to maintain an appropriate behavior (33). Lenzen et al. (92) stated that nearly half of the studies (47%) have revealed a theoretical structure for action planning as a crucial factor in behavioral regulation. Behavior change theories are the most common frameworks for goal setting or action planning to change a person's behavior. Nearly 24% of studies reported self-efficacy -one of the constructs of the Social Cognitive theory (93), - as a key concept for setting goals (94) Using these theories can overcome the intention-behavior gap and barriers to behavior change. Self-Regulation theory, Proactive Coping theory, Health Action Process approach, Self-Determination theory, and TPB other behavioral change theories. These theories were reported to be used because of their focus on bridging the intention-behavior gap and barriers to behavior change. In the present study, 11 domains of the TDF were identified as determinants. In each study, depending on the type of behavior, different domains of the TDF have been selected. In line with our study, in a qualitative study on TDF aimed to investigate barriers and facilitators to breaking up and reducing sitting time, 11 domains related to this behavior were identified (95).

5.1. Conclusions

The results of the present study indicated that taking a healthy sitting posture in employees is a multi-level factor. Also, effective comprehensive interventions are needed to target determinants of doing a behavior at the individual, interpersonal, and organizational levels. Through adopting a theory-based approach, we identified 12 determinants to taking proper sitting posture among office workers. TDF was designed as a theoretical lens to observe the cognitive, emotional, environmental effects on behavior.

Its domains are derived from a large number of theories of behavior change. Behavior change requires an understanding of the effects of behavior on the context, in which behavior occurs.

5.2. Strengths and Limitations

The present study was a first attempt to understand determinants of proper sitting posture based on TDF. In this study, only Iranian office workers were included as the study sample. Factors discouraging proper posture may vary between other countries.

Footnotes

Authors' Contribution: Study concept and design: AR, PH, and MG. Analysis and interpretation of data: PH, AR, and MGH. Drafting of the manuscript: PH and ST. Critical revision of the manuscript for important intellectual content: AR and MGH.

Conflict of Interests: The authors declared that they have no competing interests.

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References

1. Kwon Y, Kim JW, Heo JH, Jeon HM, Choi EB, Eom GM. The effect of sitting posture on the loads at cervico-thoracic and lumbosacral joints. *Technol Health Care*. 2018;**26**(S1):409–18. doi: 10.3233/THC-174717. [PubMed: 29758964]. [PubMed Central: PMC6004963].
2. van Uffelen JG, Wong J, Chau JY, van der Ploeg HP, Riphagen I, Gilson ND, et al. Occupational sitting and health risks: a systematic review. *Am J Prev Med*. 2010;**39**(4):379–88. doi: 10.1016/j.amepre.2010.05.024. [PubMed: 20837291].
3. Patel AV, Bernstein L, Deka A, Feigelson HS, Campbell PT, Gapstur SM, et al. Leisure time spent sitting in relation to total mortality in a prospective cohort of US adults. *Am J Epidemiol*. 2010;**172**(4):419–29. doi: 10.1093/aje/kwq155. [PubMed: 20650954]. [PubMed Central: PMC3590043].
4. Arshad HS, Maqsood U, Aziz A. Awareness of Sitting Posture in Patients Having Chronic Low Back Pain. *Int J Sci Res*. 2015;**4**(4):481–4.
5. Bridger RS, Groom MR, Jones H, Pethybridge RJ, Pullinger N. Task and postural factors are related to back pain in helicopter pilots. *Aviat Space Environ Med*. 2002;**73**(8):805–11. [PubMed: 12182222].
6. Massaccesi M, Pagnotta A, Soccetti A, Masali M, Masiero C, Greco F. Investigation of work-related disorders in truck drivers using RULA method. *Appl Ergon*. 2003;**34**(4):303–7. doi: 10.1016/S0003-6870(03)00052-8. [PubMed: 12880740].
7. Pynt J, Higgs J, Mackey M. Historical perspective milestones in the evolution of lumbar spinal postural health in seating. *Spine (Phila Pa 1976)*. 2002;**27**(19):2180–9. doi: 10.1097/00007632-200210010-00020. [PubMed: 12394936].
8. Sondergaard KH, Olesen CG, Sondergaard EK, de Zee M, Madeleine P. The variability and complexity of sitting postural control are associated with discomfort. *J Biomech*. 2010;**43**(10):1997–2001. doi: 10.1016/j.jbiomech.2010.03.009. [PubMed: 20399433].
9. Daneshmandi H, Choobineh A, Ghaem H, Karimi M. Adverse Effects of Prolonged Sitting Behavior on the General Health of Office Workers. *J Lifestyle Med*. 2017;**7**(2):69–75. doi: 10.15280/jlm.2017.7.2.69. [PubMed: 29026727]. [PubMed Central: PMC5618737].
10. Ng A, Hayes MJ, Polster A. Musculoskeletal Disorders and Working Posture among Dental and Oral Health Students. *Healthcare (Basel)*. 2016;**4**(1). doi: 10.3390/healthcare4010013. [PubMed: 27417601]. [PubMed Central: PMC4934547].
11. Koytcheva V, Zhekov A, Lazarou GER. *Musculoskeletal Disorders, Promoting Health for Working Women*. 2008.
12. Loghmani A, Golshiri P, Zamani A, Kheirmand M, Jafari N. Musculoskeletal symptoms and job satisfaction among office-workers: a cross-sectional study from Iran. *Acta Med Acad*. 2013;**42**(1):46–54. doi: 10.5644/ama2006-124.70. [PubMed: 23735066].
13. Daneshmandi H, Choobineh AR, Ghaem H, Alhamd M, Fakherpour A. The effect of musculoskeletal problems on fatigue and productivity of office personnel: a cross-sectional study. *J Prev Med Hyg*. 2017;**58**(3):E252–8. [PubMed: 29123372]. [PubMed Central: PMC5668935].
14. Yasobant S, Rajkumar P. Work-related musculoskeletal disorders among health care professionals: A cross-sectional assessment of risk factors in a tertiary hospital, India. *Indian J Occup Environ Med*. 2014;**18**(2):75–81. doi: 10.4103/0019-5278.146896. [PubMed: 25568602]. [PubMed Central: PMC4280781].
15. Piranveyseh P, Motamedzade M, Osatuke K, Mohammadfam I, Moghimbeigi A, Soltanzadeh A, et al. Association between psychosocial, organizational and personal factors and prevalence of musculoskeletal disorders in office workers. *Int J Occup Saf Ergon*. 2016;**22**(2):267–73. doi: 10.1080/10803548.2015.1135568. [PubMed: 26757785].
16. Mozafari A, Vahedian M, Mohebi S, Najafi M. Work-related musculoskeletal disorders in truck drivers and official workers. *Acta Med Iran*. 2015;**53**(7):432–8. [PubMed: 26520631].
17. Mehrdad RM, Shams-Hosseini N, Aghdaei S, Yousefian M. Prevalence of Low Back Pain in Health Care Workers and Comparison with Other Occupational Categories in Iran: A Systematic Review. *Iran J Med Sci*. 2016;**41**(6):467–78. [PubMed: 27853326]. [PubMed Central: PMC5106561].
18. Hoy D, Bain C, Williams G, March L, Brooks P, Blyth F, et al. A systematic review of the global prevalence of low back pain. *Arthritis Rheum*. 2012;**64**(6):2028–37. doi: 10.1002/art.34347. [PubMed: 22231424].
19. Freimann T, Coggon D, Merisalu E, Animagi L, Paasuke M. Risk factors for musculoskeletal pain amongst nurses in Estonia: a cross-sectional study. *BMC Musculoskelet Disord*. 2013;**14**:334. doi: 10.1186/1471-2474-14-334. [PubMed: 24289649]. [PubMed Central: PMC4219579].
20. Spekle EM, Hoozemans MJ, Blatter BM, Heinrich J, van der Beek AJ, Knol DL, et al. Effectiveness of a questionnaire based intervention programme on the prevalence of arm, shoulder and neck symptoms, risk factors and sick leave in computer workers: a cluster randomised controlled trial in an occupational setting. *BMC Musculoskelet Disord*. 2010;**11**:99. doi: 10.1186/1471-2474-11-99. [PubMed: 20507548]. [PubMed Central: PMC2890602].
21. Rambabu T, Suneetha K. Prevalence of work related musculoskeletal disorders among physicians, surgeons and dentists: a comparative study. *Ann Med Health Sci Res*. 2014;**4**(4):578–82. doi: 10.4103/2141-9248.139327. [PubMed: 25221708]. [PubMed Central: PMC4160684].

22. Ghanbary A, Habibi E. Evaluation of Musculoskeletal disorders among computer Users in Isfahan. *Iran J Health Safety Environ*. 2015;**2**(3):330–4.
23. Mohammadi Zeydi E, Heydarnia A, Niknami SH. Predicting factors of worker behavior for proper working posture based on planed behavior theory. *Armaghane Danesh*. 2008;**13**(3):111–22.
24. Falaki H, Akbari H, Mitra Hannani MMD, Motalebi M. Prevalence and postural risk factors associated with musculoskeletal disorders among medical laboratory personnel in Kashan in 2012. *Iran Occup Health*. 2015;**12**(6).
25. Habibi E, Soury S. The effect of three ergonomics interventions on body posture and musculoskeletal disorders among stuff of Isfahan Province Gas Company. *J Educ Health Promot*. 2015;**4**:65. doi: 10.4103/2277-9531.162386. [PubMed: 26430692]. [PubMed Central: PMC4579772].
26. Muppavram S, Patel N, Nadeem M. Posture Alert. *2018 IEEE Region Ten Symposium (Tensymp)*. 2018. p. 213–8.
27. Prins Y, Crous L, Louw QA. A systematic review of posture and psychosocial factors as contributors to upper quadrant musculoskeletal pain in children and adolescents. *Physiother Theory Pract*. 2008;**24**(4):221–42. doi: 10.1080/09593980701704089. [PubMed: 18574749].
28. Trask C, Mathiassen SE, Wahlstrom J, Heiden M, Rezagholi M. Data collection costs in industrial environments for three occupational posture exposure assessment methods. *BMC Med Res Methodol*. 2012;**12**:89. doi: 10.1186/1471-2288-12-89. [PubMed: 22738341]. [PubMed Central: PMC3439320].
29. Meijsen P, Knibbe HJ. Work-related musculoskeletal disorders of perioperative personnel in the Netherlands. *AORN J*. 2007;**86**(2):193–208. doi: 10.1016/j.aorn.2007.07.011. [PubMed: 17683718].
30. Eltayeb S, Staal JB, Hassan A, de Bie RA. Work related risk factors for neck, shoulder and arms complaints: a cohort study among Dutch computer office workers. *J Occup Rehabil*. 2009;**19**(4):315–22. doi: 10.1007/s10926-009-9196-x. [PubMed: 19685174]. [PubMed Central: PMC2775111].
31. Wahlstrom J. Ergonomics, musculoskeletal disorders and computer work. *Occup Med (Lond)*. 2005;**55**(3):168–76. doi: 10.1093/occmed/kqi083. [PubMed: 15857896].
32. Mohan V, Inbaraj LR, George CE, Norman G. Prevalence of complaints of arm, neck, and shoulders among computer professionals in Bangalore: A cross-sectional study. *J Family Med Prim Care*. 2019;**8**(1):171–7. doi: 10.4103/jfmpc.jfmpc_253_18. [PubMed: 30911501]. [PubMed Central: PMC6396627].
33. Michie S, West R, Campbell R, Brown J, Gainforth H. *ABC of Behaviour Change Theories*. Silverback Publishing; 2014.
34. McSherry LA, Dombrowski SU, Francis JJ, Murphy J, Martin CM, O'Leary JJ, et al. 'It's a can of worms': understanding primary care practitioners' behaviours in relation to HPV using the Theoretical Domains Framework. *Implement Sci*. 2012;**7**:73. doi: 10.1186/1748-5908-7-73. [PubMed: 22862968]. [PubMed Central: PMC3523072].
35. Rubinstein H, Marcu A, Yardley L, Michie S. Public preferences for vaccination and antiviral medicines under different pandemic flu outbreak scenarios. *BMC Public Health*. 2015;**15**:190. doi: 10.1186/s12889-015-1541-8. [PubMed: 25884522]. [PubMed Central: PMC4350649].
36. Hameed PS. Prevalence of work related low back pain among the information technology professionals in India a cross sectional study. *Int J Sci Technol Res*. 2013;**2**(7):80–5.
37. Cadogan SL, McHugh SM, Bradley CP, Browne JP, Cahill MR. General practitioner views on the determinants of test ordering: a theory-based qualitative approach to the development of an intervention to improve immunoglobulin requests in primary care. *Implement Sci*. 2016;**11**(1):102. doi: 10.1186/s13012-016-0465-8. [PubMed: 27435839]. [PubMed Central: PMC4952272].
38. Flannery C, McHugh S, Anaba AE, Clifford E, O'Riordan M, Kenny LC, et al. Enablers and barriers to physical activity in overweight and obese pregnant women: an analysis informed by the theoretical domains framework and COM-B model. *BMC Pregnancy Childbirth*. 2018;**18**(1):178. doi: 10.1186/s12884-018-1816-z. [PubMed: 29783933]. [PubMed Central: PMC5963099].
39. Alexander KE, Brijnath B, Mazza D. Barriers and enablers to delivery of the Healthy Kids Check: an analysis informed by the Theoretical Domains Framework and COM-B model. *Implement Sci*. 2014;**9**:60. doi: 10.1186/1748-5908-9-60. [PubMed: 24886520]. [PubMed Central: PMC4047437].
40. Handley MA, Harleman E, Gonzalez-Mendez E, Stotland NE, Althavale P, Fisher L, et al. Applying the COM-B model to creation of an IT-enabled health coaching and resource linkage program for low-income Latina moms with recent gestational diabetes: the STAR MAMA program. *Implement Sci*. 2016;**11**(1):73. doi: 10.1186/s13012-016-0426-2. [PubMed: 27193580]. [PubMed Central: PMC4870786].
41. Veenstra L, Schneider IK, Koole SL. Embodied mood regulation: the impact of body posture on mood recovery, negative thoughts, and mood-congruent recall. *Cogn Emot*. 2017;**31**(7):1361–76. doi: 10.1080/02699931.2016.1225003. [PubMed: 27626675].
42. Janwantanakul P, Pensri P, Jiamjarasrangsri V, Sinsongsook T. Prevalence of self-reported musculoskeletal symptoms among office workers. *Occup Med (Lond)*. 2008;**58**(6):436–8. doi: 10.1093/occmed/kqn072. [PubMed: 18544589].
43. Thomsen JF, Gerr F, Atroshi I. Carpal tunnel syndrome and the use of computer mouse and keyboard: a systematic review. *BMC Musculoskelet Disord*. 2008;**9**:134. doi: 10.1186/1471-2474-9-134. [PubMed: 18838001]. [PubMed Central: PMC2569035].
44. Tornqvist EW, Hagberg M, Hagman M, Risberg EH, Toomingas A. The influence of working conditions and individual factors on the incidence of neck and upper limb symptoms among professional computer users. *Int Arch Occup Environ Health*. 2009;**82**(6):689–702. doi: 10.1007/s00420-009-0396-7. [PubMed: 19205721].
45. Atkins L, Francis J, Islam R, O'Connor D, Patey A, Ivers N, et al. A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implement Sci*. 2017;**12**(1):77. doi: 10.1186/s13012-017-0605-9. [PubMed: 28637486]. [PubMed Central: PMC5480145].
46. McBain H, Begum S, Rahman S, Mulligan K. Barriers to and enablers of insulin self-titration in adults with Type 2 diabetes: a qualitative study. *Diabet Med*. 2017;**34**(2):253–61. doi: 10.1111/dme.13196. [PubMed: 27505306].
47. Ilbeigi S, Kabootari A, Afzalpour M, Farzaneh H. The Relationship between Sitting Posture and Musculoskeletal Pain in Boy Elementary School Students. *J Ergonom*. 2017;**5**(3):41–9. doi: 10.30699/jergon.5.3.41.
48. Robertson M, Amick B3, DeRango K, Rooney T, Bazzani L, Harrist R, et al. The effects of an office ergonomics training and chair intervention on worker knowledge, behavior and musculoskeletal risk. *Appl Ergon*. 2009;**40**(1):124–35. doi: 10.1016/j.apergo.2007.12.009. [PubMed: 18336791].
49. Zakerian SA, Monazzam MR, Dehghan SF, Mohraz MH, Safari H, Asghari M. Relationship between knowledge of ergonomics and workplace conditions with musculoskeletal disorders among nurses: A questionnaire survey. *World Appl Sci J*. 2013;**24**(2).
50. Solhi M, Khalili Z, Zakerian SA, Eshraghian MR. Prevalence of symptom of musculoskeletal disorders and predictors of proper posture among computer users based on stages of change model in computer users in central Headquarter, Tehran University of Medical Sciences. *Iran Occup Health*. 2014;**11**(5):43–52.
51. Mohammadi Zeydi E, Farmanbar RA, Morshedi H, Mohammadi Zeydi B, Karbord A. Effectiveness of an ergonomic education to modify of body posture, ergonomic risk factors and musculoskeletal pain severity in computer users. *J Guilan Univ Med Sci*. 2010;**74**(15-28).
52. Nair S, Sagar M, Sollers J3, Consedine N, Broadbent E. Do slumped and upright postures affect stress responses? A randomized trial. *Health Psychol*. 2015;**34**(6):632–41. doi: 10.1037/hea0000146. [PubMed: 25222091].

53. Shojaei S, Tavafian SS, Jamshidi AR, Wagner J. A Multidisciplinary Workplace Intervention for Chronic Low Back Pain among Nursing Assistants in Iran. *Asian Spine J*. 2017;**11**(3):419–26. doi: 10.4184/asj.2017.11.3.419. [PubMed: 28670410]. [PubMed Central: PMC5481597].
54. Kazak AE, Derosa BW, Schwartz LA, Hobbie W, Carlson C, Ittenbach RF, et al. Psychological outcomes and health beliefs in adolescent and young adult survivors of childhood cancer and controls. *J Clin Oncol*. 2010;**28**(12):2002–7. doi: 10.1200/JCO.2009.25.9564. [PubMed: 20231679]. [PubMed Central: PMC2860405].
55. Khandan M, Koohpaei A, Kohansal Aghchay M, Ebrahimi MH, Khammar A, Arsang Jang S, et al. Assessing the Factors Predicting Work-Related Musculoskeletal Disorders Among Iranian Port's Personnel Using Regression Model. *Iran Rehabil J*. 2017;**15**(4):309–16. doi: 10.29252/nrip.irj.15.4.309.
56. Yip Y. A study of work stress, patient handling activities and the risk of low back pain among nurses in Hong Kong. *J Adv Nurs*. 2001;**36**(6):794–804. doi: 10.1046/j.1365-2648.2001.02037.x. [PubMed: 11903709].
57. Langballe EM, Innstrand ST, Hagtvet KA, Falkum E, Gjerlow Aasland O. The relationship between burnout and musculoskeletal pain in seven Norwegian occupational groups. *Work*. 2009;**32**(2):179–88. doi: 10.3233/WOR-2009-0804. [PubMed: 19289871].
58. Michalak J, Troje NF, Fischer J, Vollmar P, Heidenreich T, Schulte D. Embodiment of sadness and depression–gait patterns associated with dysphoric mood. *Psychosom Med*. 2009;**71**(5):580–7. doi: 10.1097/PSY.0b013e3181a2515c. [PubMed: 19414617].
59. Oosterwijk S, Rotteveel M, Fischer AH, Hess U. Embodied emotion concepts: How generating words about pride and disappointment influences posture. *Eur J Soc Psychol*. 2009;**39**(3):457–66. doi: 10.1002/ejsp.584.
60. Riskind JH, Gotay CC. Physical posture: Could it have regulatory or feedback effects on motivation and emotion? *Motiv Emotion*. 1982;**6**(3):273–98. doi: 10.1007/bf00992249.
61. Ranasinghe P, Perera YS, Lamabadusuriya DA, Kulatunga S, Jayawardana N, Rajapakse S, et al. Work related complaints of neck, shoulder and arm among computer office workers: a cross-sectional evaluation of prevalence and risk factors in a developing country. *Environ Health*. 2011;**10**:70. doi: 10.1186/1476-069X-10-70. [PubMed: 21816073]. [PubMed Central: PMC3162880].
62. Marcus M, Gerr F, Monteilh C, Ortiz DJ, Gentry E, Cohen S, et al. A prospective study of computer users: II. Postural risk factors for musculoskeletal symptoms and disorders. *Am J Ind Med*. 2002;**41**(4):236–49. doi: 10.1002/ajim.10067. [PubMed: 11920967].
63. van den Heuvel SG, van der Beek AJ, Blatter BM, Bongers PM. Do work-related physical factors predict neck and upper limb symptoms in office workers? *Int Arch Occup Environ Health*. 2006;**79**(7):585–92. doi: 10.1007/s00420-006-0093-8. [PubMed: 16710709].
64. Griffiths KL, Mackey MG, Adamson BJ. Behavioral and psychophysiological responses to job demands and association with musculoskeletal symptoms in computer work. *J Occup Rehabil*. 2011;**21**(4):482–92. doi: 10.1007/s10926-010-9263-3. [PubMed: 21327727].
65. van den Heuvel SG, van der Beek AJ, Blatter BM, Hoogendoorn WE, Bongers PM. Psychosocial work characteristics in relation to neck and upper limb symptoms. *Pain*. 2005;**114**(1-2):47–53. doi: 10.1016/j.pain.2004.12.008. [PubMed: 15733630].
66. Torp S, Riise T, Moen BE. The impact of psychosocial work factors on musculoskeletal pain: a prospective study. *J Occup Environ Med*. 2001;**43**(2):120–6. doi: 10.1097/00043764-200102000-00010. [PubMed: 11227629].
67. Zakerian SA, Subramaniam ID. The relationship between psychosocial work factors, work stress and computer-related musculoskeletal discomforts among computer users in Malaysia. *Int J Occup Saf Ergon*. 2009;**15**(4):425–34. doi: 10.1080/10803548.2009.11076822. [PubMed: 20003776].
68. Abdul Rahman H, Abdul-Mumin K, Naing L. Psychosocial Work Stressors, Work Fatigue, and Musculoskeletal Disorders: Comparison between Emergency and Critical Care Nurses in Brunei Public Hospitals. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2017;**11**(1):13–8. doi: 10.1016/j.anr.2017.01.003. [PubMed: 28388975].
69. Bohr PC. Efficacy of office ergonomics education. *J Occup Rehabil*. 2000;**10**(4):243–55. doi: 10.1023/a:1009464315358.
70. Zakaria D, Robertson J, MacDermid J, Hartford K, Koval J. Work-related cumulative trauma disorders of the upper extremity: navigating the epidemiologic literature. *Am J Ind Med*. 2002;**42**(3):258–69. doi: 10.1002/ajim.10100. [PubMed: 12210694].
71. Celik S, Celik K, Dirimese E, Tasdemir N, Arik T, Buyukkara I. Determination of pain in musculoskeletal system reported by office workers and the pain risk factors. *Int J Occup Med Environ Health*. 2018;**31**(1):91–111. doi: 10.13075/ijomeh.1896.00901. [PubMed: 28972599].
72. Song H, Lee C. The Differences the Relationship According to Body Part between Occupational Stress and Self-reported Musculoskeletal Disorder Symptoms as Seen in Surveys of Public Office Workers Using VDT. *Korean J Occup Environ Med*. 2012;**24**(1). doi: 10.35371/kjoem.2012.24.1.20.
73. Jiménez P, Winkler B, Dunkl A. Creating a healthy working environment with leadership: the concept of health-promoting leadership. *Int J Hum Resour Manag*. 2016;**28**(17):2430–48. doi: 10.1080/09585192.2015.1137609.
74. Khalili Z, Tosanloo MP, Safari H, Khosravi B, Zakerian SA, Servatian N, et al. Effect of educational intervention on practicing correct body posture to decrease musculoskeletal disorders among computer users. *J Educ Health Promot*. 2018;**7**:166. doi: 10.4103/jehp.jehp_-121_18. [PubMed: 30693302]. [PubMed Central: PMC6332669].
75. Panter-Brick C, Clarke SE, Lomas H, Pinder M, Lindsay SW. Culturally compelling strategies for behaviour change: a social ecology model and case study in malaria prevention. *Soc Sci Med*. 2006;**62**(11):2810–25. doi: 10.1016/j.socscimed.2005.10.009. [PubMed: 16352385].
76. Moazzami Z, Dehdari T, Taghdisi MH, Soltanian AR. Readiness to adopting correct posture in operating-room nurses based on transtheoretical model (TTM) in Hamadan city in 2011. *Iran J Epidemiol*. 2013;**9**(1):66–74.
77. Lajunen T, Rasanen M. Can social psychological models be used to promote bicycle helmet use among teenagers? A comparison of the Health Belief Model, Theory of Planned Behavior and the Locus of Control. *J Safety Res*. 2004;**35**(1):115–23. doi: 10.1016/j.jsr.2003.09.020. [PubMed: 14992852].
78. Madden TJ, Ellen PS, Ajzen I. A Comparison of the Theory of Planned Behavior and the Theory of Reasoned Action. *Pers Soc Psychol Bull*. 2016;**18**(1):3–9. doi: 10.1177/0146167292181001.
79. Mohahammadi-Zeidi I, Khalaj M, Mohahammadi-Zeidi B. Assessing the readiness of assembly line workers to adopt the upright posture. *J Inflam Dis*. 2012;**15**(4):77–85.
80. Abedi B, Farmanbar R, Omidi S, Jahangir Blourchian M. Predicting Correct Body Posture based on Theory of Planned Behavior in Iranian Operating Room Nurses. *Int J Occup Hyg*. 2015;**7**(2):105–9.
81. Alexy B. Goal setting and health risk reduction. *Nurs Res*. 1985;**34**(5):283–8. [PubMed: 3850489].
82. Anshel MH, Weinberg R, Jackson A. The effect of goal difficulty and task complexity on intrinsic motivation and motor performance. *J Sport Behav*. 1992;**15**(2):159.
83. Bandura A, Schunk DH. Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *J Pers Soc Psychol*. 1981;**41**(3):586–98. doi: 10.1037/0022-3514.41.3.586.
84. Netz Y, Zeev A, Dunsky A. Postural control and posture-unrelated attention control in advanced age-An exploratory study. *Maturitas*. 2018;**116**:130–6. doi: 10.1016/j.maturitas.2018.08.003. [PubMed: 30244774].
85. Caldwell JA, Prazinko BF, Hall KK. The effects of body posture on resting electroencephalographic activity in sleep-deprived subjects. *Clin Neurophysiol*. 2000;**111**(3):464–70. doi: 10.1016/s1388-2457(99)00289-8.
86. Hockey GJ. A motivational control theory of cognitive fatigue. In: Ack-

erman PL, editor. *Cognitive fatigue: Multidisciplinary perspectives on current research and future applications*. Washington, DC: American Psychological Association; 2011. p. 167–87. doi: 10.1037/12343-008.
87. Krauchi K, Cajochen C, Wirz-Justice A. A relationship between heat loss and sleepiness: effects of postural change and melatonin administration. *J Appl Physiol (1985)*. 1997;**83**(1):134–9. doi: 10.1152/jappl.1997.83.1.134. [PubMed: 9216955].
88. Sharafkhaneh A, Hirshkowitz M. Contextual factors and perceived self-reported sleepiness: a preliminary report. *Sleep Med*. 2003;**4**(4):327–31. doi: 10.1016/s1389-9457(03)00002-9. [PubMed: 14592305].
89. Romeijn N, Raymann RJ, Most E, Te Lindert B, Van Der Meijden WP, Fronczek R, et al. Sleep, vigilance, and thermosensitivity. *Pflugers Arch*. 2012;**463**(1):169–76. doi: 10.1007/s00424-011-1042-2. [PubMed: 22048563]. [PubMed Central: PMC3256315].
90. Cole RJ. Postural baroreflex stimuli may affect EEG arousal and sleep in humans. *J Appl Physiol (1985)*. 1989;**67**(6):2369–75. doi: 10.1152/jappl.1989.67.6.2369. [PubMed: 2606843].
91. Imanzad M, Gharlipour Z, Kohpaie A, Mohebi S, Gang SA, Sayyarpour M, et al. Behavioral factors related to musculoskeletal disorders in nurses based on theory of planned behavior. *Adv Nurs Midwifery*. 2013;**23**(81):1–12.
92. Lenzen SA, Daniels R, van Bokhoven MA, van der Weijden T, Beurskens A. Disentangling self-management goal setting and action planning: A scoping review. *PLoS One*. 2017;**12**(11). e0188822. doi: 10.1371/journal.pone.0188822. [PubMed: 29176800]. [PubMed Central: PMC5703565].
93. Bandura A. *Socialfoundations of thoughtandaction:A socialcognitivetheory*. EnglewoodCliffs; 1986.
94. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev*. 1977;**84**(2):191–215. doi: 10.1037//0033-295x.84.2.191. [PubMed: 847061].
95. Ojo SO, Bailey DP, Hewson DJ, Chater AM. Perceived Barriers and Facilitators to Breaking Up Sitting Time among Desk-Based Office Workers: A Qualitative Investigation Using the TDF and COM-B. *Int J Environ Res Public Health*. 2019;**16**(16). doi: 10.3390/ijerph16162903. [PubMed: 31416112]. [PubMed Central: PMC6720704].