Correct body posture in nurses: an application ofmotivational interviewing

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Abstract

According to the importance of correct posture as one of the preventive strategies of low back pain and given the importance of approaches such as motivational interviewing for encouraging people to adopt healthy behaviors; this study was performed to determine the effect of motivational interviewing based on Transtheoretical Model (TTM) to adopting correct body posture in operating room nurses. In this quasi-experimental study, 82 nurses who were in the contemplation and preparation stages for adopting correct body posture were selected and randomly assigned into intervention and control groups. Instruments for gathering data were a questionnaire based on the TTM and a checklist for assessing adopting correct body posture. Two groups were completed questionnaires before the intervention. Five sessions of group motivational interviewing was conducted to the intervention group. Two groups were followed-up one-month after intervention. The results showed that 45.2% of nurses in the intervention group were in contemplation stage and 54.8% were in preparation stage before the intervention. One month after the intervention, more percentage of participants in the intervention group moved into the action stagecompared to the control group. Following the intervention, perceived benefits, all cognitive and behavioral processes, self-efficacy and also adopting correct body posture were significantly higher in the intervention group compared to the control group. There was a significant reduction in perceived barriers in the intervention group compared to the control group after the intervention. It can be concluded that implementing motivational interviewing based on TTM is an effective method for encouraging nurses to adopt correct body posture.

Keywords: Motivational interviewing, Nurse, Body posture, Transtheoretical Model

Introduction

Work Related Musculoskeletal Disorders are an important variable in occupational injuries and disabilities [1]. Literature showed that 37% of low back pains are related to work [2]. Nursing is a job with high risk of low back pain [3, 4].
The prevalence of low back pain among nurses in Shiraz and Najaf Abad was 54.9% and 68.4%, respectively [5,6]. Low back pain of nurses is associated with multiple risk factorssuch as Physical and psycho-social factors and

work-related posture [7,8].Among Iranian nurses,awkward posture was found to be the main factor associated with musculoskeletal disorders, especially low back pain [5,6]. It is considering that among nurses, operating room nurses are mostly exposed to low back pain. The results of a study showed that prevalence of low back pain was 84% among operating room nurses in the United States [9]. In the other study, Choobineh*et al* found that prevalence of low back pain was 60.6% among operating room nurses in Shiraz

[10]. Operating room nurses are exposed to prolonged standing with awkward posture during operations [11].

Static pressure on the operating room nurses caused by long-term standings during the operations and staying in that position for a long time depends on the kind of operation and its time duration, incorrect posture during the operation and doing the repetitive and monotonous tasks for a long time and with a high rate. Posed dynamic pressures are also due to activities which require pushing, pulling or lifting heavy instruments such as parts of the operation bed and sets which are contributing factors for causing back pain [12].

The position of head, trunk, and limbs at work is called body position or posture [13]. Adopting correct body posture is an effective strategy in enhancing health, reducing stress at work. It is also an important factor in terms of work efficiency and performance [14].

One way to preventing chronic low back pain is training the principles of correct body mechanics, principles of ergonomics, and correct body posture. The results of a study showed that five years after ergonomic education, the rate of injuries on the upper and lower back and shoulders, as well as the lost work days and the workdays with limitation considerably reduced in nurses [15].

Transtheoretical Model (TTM) was presented by Procheska and Diclemente for quitting smoking in 1983 [16]. According to this model, individuals performing a new behavior go through five stages of readiness to change: including pre-contemplation, contemplation, preparation, action, and maintenance [17].

At the pre-contemplation stage, the individual has not thought of a change in his/her behavior at least for the following 6 months.At the contemplation stage, the individual seriously thinks of changing the behavior and is decided to make a change in the near future (usually the next month). Action is the stage in which the individual begins with changing the specific behavior (within the last six months). Finally, in maintenance stage, the individual maintains the changed behavior through a longer period of time (for more than 6 months) [18].

The next construct in this model is experiential (cognitive) and environmental (behavioral) processes of change. Cognitive processes are including consciousness raising, dramatic relief, environmental reevaluation, social liberation, and self-reevaluation. Also, behavioral processes are including counterconditioning, stimulus control, helping relationships, reinforcement management, and self-liberation. Decisional balance is the third construct in this model. This variable indicates balance between perceived pros and cons of changed behavior [19]. The fourth construct is perceived self-efficacy, which represents the degree an individual is confident about his/her ability in performing a specific behavior [20].

According to TTM, behavior change interventions should be identifying people's stage of readiness to change and providing suitable interventions for progressive movement of them from stage to next stage [21]. Motivational interviewing (MI) is an effective method for moving individuals through five stages of change [22]. MI is a client-centered counseling style. It is enhancing individual responsibility and internal attributions of change. This method explores and resolves ambivalence of participants [23]. First, MI was first introduced by Miller in 1983 [24] and was later developed by Miller and Rollnick [25]. The basis of MI is collaboration of participants, evoke intrinsic motivation and respect to individual's autonomy. In addition, it emphasizes on principles such as explore and resolve ambivalence, express empathy, enhance intrinsic motivation, support self-efficacy, avoid argumentation and develop discrepancy. It utilizes counseling techniques such as asking open-ended questions, reflective listening, and affirmations, summarize and elicit self motivating statements. The important focus of MI is facilitating behavior change by helping participants to explore and resolve their ambivalence related to behavior change [25,29]. According to the importance of correct body posture as a preventive strategy of low back pain, and also given that client-centered counseling approaches have shown better results than traditional approaches [30], this study was conducted with the aim to assess the effect of MI based on TTM in adopting correct body

posture in operating room nurses in Hamedan in 2011.

Method

This quasi-experimental study was conducted on 82 operating room nurses in Hamedan. First, four hospitals were randomly selected among hospitals of Hamedan. Then, TTM algorithm for assessing stages of readiness to adopting correct body posturewas completed for all operating room nurses. According to estimated sample size, 84 nurses who were in the contemplation and preparation stages and met inclusion criteria were selected. The selection criteria in this study were like this: no history of low back surgery, no pregnancy, working experience in the operatingroom more than 6 months and no chronic low back pain. They randomly assigned into intervention and control groups. Two participants in the control group did not fully complete the questionnaires. Finally, 82 questionnaires were analyzed. Before the study, the aims of the study were explained to participants and a written consent was obtained of them. The present study has been approved by the ethics committee of Tehran University of Medical Sciences.

Demographic characteristics and TTM items were measured by questionnaires. Correct body posture were assessed using an observational checklist. TTM items were developed based on literature review [9,10,31] and two focus group discussions with 20 operating room nurses (in the pilot study). To developing checklist, an ergonomic expert observed nurses' movements and postures during one month. Finally, sixteen types of movements were identified. Validity of TTM items and designed checklist were assessed by content validity (qualitative method). For this purpose, twenty experts in health education, nursing and ergonomics reviewed the items of scale. Reliability of TTM items were measured through Cronbach'sα and the test-retest correlation coefficients with 20 nurses (with a 2-week interval between the tests). Also, inter-rater reliability was calculated for designed checklist, at the same time, by the two ergonomics.The estimate of $\alpha \geq .70$, correlation coefficient $\geq .61$ and Kappa values $\geq .60$ were considered to be satisfactory.The completion of the questionnaires lasted 30 to 35 minutes.

Designed algorithm by Keller *et al* was used to assess the stages of readiness to change for adopting correct body posture among nurses [21]. According to this 5-item algorithm, participants were categorized intoone of the five stages of change based on the answers to these items:

1) Do you adopt in behaviors correct body posture in the operating room?
A) No, and I do not intend to do it within the next 6 months (pre-contemplation stage); B) No, but I intend to do it within the next 6 months (contemplation stage); C) No, but I intend to do it in the next 30 days (preparation stage); D) Yes, I have done it, but for 6 months or less (action stage) and; E) Yes, I have done it for more than 6 months (maintenance stage). Nurses should select only one item. The test–retest correlation coefficient for this scale was .81 ($P < .05$).

Eight items were used to evaluate the perceived benefits and 8 items the perceived barriers. Items of these scales were measured on a Likert scale ranging from 1 (completely disagree) to 5 (completely agree). Cronbach's α for the perceived benefits scale was .85 and was .86 for the perceived barriers. Self-efficacy scale with 6 items was measured. Items of this scale were measured on a Likert scale ranging from 1 (completely unconfident) to 5 (completely confident). Cronbach's α for this scale was .78

Cognitive and behavioral processes of change were measured with 18 items. Eleven items of cognitive processes of change were including: consciousness (3 items), environmental reevaluation (2 items), self-reevaluation (3 items) and social liberation (3 items). Cronbach's α for these scales were 0.88, 0.85, 0.84 and 0.80, respectively. Seven items of behavioral processes change were including: reinforcement management (2 items), counter conditioning (3 items) and self-liberation (2 items).Cronbach's α for these scales were 0.99, 0.78 and 0.80, respectively. All items of cognitive and behavioral processes of change were measured on a Likert scale ranging from 1 (never) to 5 (very often). Adopting correct body posture in the operating room was measured

using a 16-item checklist. This checklist was completed by agronomist observers before and after the intervention for both groups. This checklist included components such as: movements (Yes/No/Not Observed).Stability of this scale as a whole was satisfactory (The kappa value= 0.80).

MI intervention was designed according to pre-test results. Five motivational interviewing sessions over four weeks was conducted for the intervention group. During sessions, nurses were divided into small groups (10 persons). In these sessions was used practices such as readiness cycle for change (using prepared scenarios), the weighting between the pros (advantages) and cons (disadvantages) of behavior change, increasing conflict between overt values and incorrect posture (definition of value, recognize and articulate his or her internal values and goals and discussion about barriers variables for adopting correct body posture in the operating room and it control (comparing value and behavior). Then, one month after intervention were completed scales and also observational checklist for both groups.

Data were analyzed by SPSS statistical software package (English version). Differences in TTM variables, correct body posture and demographic variables between the groups were also tested using χ^2 andindependent- samples t test. Mann-Whitney test was used to assess the difference in stages of change between both groups. Differences in TTM variables (exception of stages of change) and correct body posture between the groups were also tested using independent- samples t test. Student's paired samples t-testwas used to identify significant differences in TTM variables (exception of stages of change) and correct body posture in each group before and after the intervention. The data were expressed as Mean±SD. P≤.05 was considered significant.

Results

The results showed that the mean age of nurses was 31.04 (±5.8) years in intervention group and was 32.65 (±6.7) years in the control group. There were no significant differences between the two groups for any of the demographic characteristics (Table 1). The results showed that more percentage of nurses in the intervention group moved into the action stage compared to the control group after intervention (61.9% against 0%). Table 2 presents the stage of change of nurses in the two groups before and 1 month after intervention. The results showed that perceived benefits, self-efficacy, all processes of cognitive and behavioral and adopting correct body posture were significantly higher in the intervention group compared to the control group after intervention (P<0.05). Also the mean of perceived barriers was significantly low in the intervention group compared to the control group after intervention (P<0.05) (Table 3).

Table 1*The demographic characteristics of nurses in the control and intervention groups*

	Intervention		Control	
	Mean(±SD)	N(%)	Mean(±SD)	N(%)
Age	31.04(±5.84)		32.65(±6.78)[†]	
Work history	9.94(±7.06)		9.25(±6.67)[†]	
Gender		33(78.6)*		25(62.5)
Female		9(21.4)		15(37.5)
Male				

Result of Chi-square; P*< 0.05between the two groups
Result of Independent- sample *t* test; P[†]< 0.05 between the two groups

Table 2 *Stages of change in nurses of both groups before and one month after intervention*

	Before intervention N (%)		After intervention N (%)	
	Intervention	Control	Intervention	Control
Pre-contemplation	0 (0%)	0 (0%)	0(0%)	1 (2.5)
Contemplation	19 (45.2)	21(52.5)	1 (2.4)	24 (60)
Preparation	23(54.8)	19 (47.5)	15 (35.7)	15 (37.5)
Action	0(0%)	0(0%)	26 (61.9)[†]	0(0%)
Maintenance	0(0%)	0(0%)	0(0%)	0(0%)

Result of Mann-Whitney test; P †< 0.05 compared to the control group

Table 3 *TTM variables in the control and intervention groups before and 1 month after intervention*

Variables	Before intervention Mean(±SD)	After intervention Mean(±SD)
Stages of change:		
InterventionControl	2.54(±0.50)	3.59(±0.54) *†
	2.48(±0.50)	2.35(±0.53)
Perceived benefits:		
InterventionControl	33.55(±7.27)	34.02(±3.19) *†
	32.25(±3.63)	31.73(±3.50)
Perceived barriers:		
Intervention	24.19(±3.93)	22.00(±3.97) *†
Control	23.32(±4.34)	23.75(±4.03)
Self-efficacy:		
Intervention	12.62(±4.51)	15.26(±4.13) *†
Control	11.88(±4.82)	11.80(±4.61)
Cognitive processes:		
Intervention	33.88(±5.16)	36.76(±4.80) *†
Control	33.97(±4.58)	34.78(±3.51)
*Behavioral processes:*InterventionControl	19.90±3.30	21.83(±3.10) *†
	18.95±3.61	18.70(±3.38)
*Adopting correct body posture:*Intervention	42.57(±3.81)	48.33(±4.00) *†
Control	42.20(±4.42)	41.45(±4.15)

Values are mean ± SD

Result of paired T-test for paired sample; P*< 0.05compared to pre-intervention values

Result of Independent- sample *t* test; P †< 0.05 compared to the control group

Discussion

This study showed that MI based on TTM had positive effect in adopting correct body posture among nurses in the operating room.

According to results, significantly more nurses in the intervention group moved from contemplation and preparation stages into the action stage one month after intervention. This finding may be associated with the effect of MI. MI is more effective in people with ambivalence and those who are the least ready for change [32].

The results also showed that MI had positive effect in the mean score of perceived benefits regarding correct body posture. Also, MI had inverse effects in perceived barriers (P<0.05). This finding is consistent with MohammadiZeidi*et al*. They showed that educational intervention can increase the advantages of correct body posture and reduce perceived barriers among the computer operators [33]. It is considering that one of used strategies in MI is encouraging people to conscious or unconscious weighing of pros and cons of change the pros and cons of behavior through detecting cognitive dissonances. In fact, MI helps people to review dissonances between current and desired behavior. This status creates motivation to behavior change. If people identify any discrepancy between their present behavior and important goals, they more encourage for change of it behavior in their life [30]. Therefore, in designing interventions for adopting correct body posture among nurses, more emphasis on the pros and cons of behavior change is essential.

In this study, there were significant difference in cognitive and behavioral processes of change in the intervention group compared to the control group (P<0.05). Processes of change are explicit and implicit activities that experienced by individuals in changing a behavior, cognition, affection and life style [34-35]. In fact, processes of change shows how people change in each stages of change. Findings of the present study are in line with Moini*et al*. They found that education based on TTM can increase the mean score of cognitive and behavioral processes for doing physical activity in the intervention group [36].

Self-efficacy for adopting the correct posture among the nurses in the intervention group had significant increase following the intervention (P<0.05). Based on Bandora's findings,

self-efficacy is the confidence a person about his/her ability to perform a behavior.

It variable is the strongest predictors of behavior.

By increasing self-efficacy, behavior change increased as well [37]. One of the principles of MI is reinforcing self-efficacy felling to change behavior. Belief of person to possibility of behavior change is an important motivational factor for change of it behavior. MI helps the person to confidence about his or her ability to doing recommended behavior [30]. Brodie*et al*. showed that MI had positive effect on self-efficacy of patients with chronic heart failure [38]. Liou investigated the relationship between self-efficacy and fatty diet behavior. He showed that self-efficacy was significantly correlated with fatty diet consumption [39].

Following the intervention, the mean score of adopting correct body posture significantly more in the intervention group than the control group ($P<0.05$). This finding is consistent with Navidian*et al* [40]. They showed that adding MI to usual healthy lifestyle training is an effective strategy in reducing blood pressure and reducing risk factors of cardiovascular diseases.

Choosing a tailored approach with needs, experiences and culture of individuals is one of the most important steps to planning behavior change and encouraging people to adopting healthy behavior.

In this study, it was observed that MI with emphasis on constructs of perceived benefits, self-efficacy, processes of change and also stages of change can be improve correct body posture among the operating room nurses. It is necessary to be more considerate to these variables in designing and implementing interventions regarding posture behavioral. Since, designing interventions based on TTM is stage-based [41], one of the limitations of the present study was not study nurses in the other stages of change such as pre-contemplation.There is need for designing tailored interventions for all stages of change among nurses.

Conclusion

The results indicated that implementing MI based on TTM constructs may be an effective intervention for increasing correct body posture among operating room nurses. Designing similar interventions in other nurses is essential.

Acknowledgements

Contributions
Study design: ZM
Data collection and analysis ZM, AS
Manuscript preparation ZM

Conflict of interest
"The authors declare that they have no competing interests."

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