

MEDIATING EFFECTS OF SELF-EFFICACY ON FRUIT AND VEGETABLE CONSUMPTION AMONG NURSING AND MIDWIFERY STAFF IN ARDABIL- APPLICATION OF TRANSTHEORETICAL MODEL

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ABSTRACT

BACKGROUND

It is highly recommended to promptly assess motivation and readiness to change in individuals who wish to achieve significant lifestyle behaviour changes in order to improve their health. In particular, motivation should be assessed in those who face the difficulty in behavioural changes.

This study is aimed to investigate the mediating effects of self-efficacy on the relationships between predicting variables and outcome variable using the Transtheoretical Model.

MATERIALS AND METHODS

This cross-sectional study was conducted with the participation of 300 nursing and midwifery staffs employed in hospitals of Ardabil city, which were selected by systematic random sampling method. The data gathering tool was a Transtheoretical Model scale. Validity and reliability was confirmed in previous study. The data were analysed by SPSS 19 using the descriptive statistics, Spearman correlation test and Multiple Logistic Regression Analysis.

RESULTS

In total, 41.34% of the samples had normal BMI. The majority of subjects (77.3%) were in the early stages of change for fruit and vegetable consumption and only 22.7 percent were located in active stages. Regression revealed that self-efficacy was the strongest predictor of stage of change ($\beta = 0.357$, $P = 0.001$) and mediated the relationships of behavioural processes with stages of change ($\beta = 0.369$, $P = 0.001$).

CONCLUSION

This study showed a strong correlation between self-efficacy, decisional balance and processes of change with stages of change. So, we suggest that in order to promoting the fruit and vegetable consumption, these variables be considered as the basis of the interventional program. Also considering the mediating effect of self-efficacy as the strongest predictor, we suggest a targeted and appropriate application of this variable in the interventions.

KEYWORDS

Self-Efficacy, Fruit and Vegetable, Transtheoretical Model.

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BACKGROUND

Chronic diseases associated with nutrition such as obesity, cardiovascular disease, type 2 diabetes and stroke have endangered the health of people around the world.^(1,2) The effects of nutrition-related diseases, beyond the effects on health have brought a significant financial burden on the population, which has been accompanied by a progressive increase in health costs.^(3,4) This financial burden is not only caused by the economic problems of society, but also caused

by some employees who are absent from work due to chronic illness and disrupt the production cycle and the provision of services.⁽⁵⁾ On the other hand, an unhealthy diet is known as one of the risk factors for nutrition related chronic disorders.⁽²⁾ Nutritional interventions such as reducing the consumption of saturated oils and fast foods and increasing the fruits and vegetables consumption are the most cost-effective interventions that can reduce the burden of chronic diseases.⁽¹⁻³⁾

The Educational Hospitals are the environments in which the personnel are ready to eat unhealthy or fast foods due to their high workload and lack of adequate time, which can have negative effects on health of both the individual and the patient.⁽⁶⁾ Given that health providers spent more than two-thirds of their time at these centres, these centres can be one of the targeted centres for educational planning.^(7,8) Due to the use of health education models, behavioural change has been a priority for health care providers. Transtheoretical

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model is one of the most common model in health education profession for changing the unhealthy behaviours.

The Transtheoretical Model (TTM) of behaviour change is an integrated theory that assesses an individual's readiness to act on a new healthy behaviour and provides strategies or processes of change to guide the individual toward the health. This model is composed of constructs including stages of change, processes of change, self-efficacy and decisional balance. The TTM suggests that individuals move through five stages of change: pre-contemplation, contemplation, preparation, action and maintenance. For each stage of change, different intervention strategies are needed to move to the next stage. The stages of change generally included the following: Contemplation stage in which people intend to change their behaviour over the next six months; Preparation stage in which individuals intend to take action in the next month; Action stage in which people have created specific and clear changes in their lifestyle in the past 6 months; and Maintenance stage in which people have created specific and obvious changes in their behaviour over six months.^(9,10)

Self-efficacy refers to the confidence level of people in finishing work behaviour based on the skills they have mastered.⁽¹¹⁾ In general, self-efficacy influences on work stress, job burnout and work satisfaction in clinical nurses.^(12,13) Stages of change model in dietary intervention program has been focused on the assessment of dietary behaviours and stages of change. Less attention has been paid to the investigation of mediating effect of other TTM constructs on stages of transition. The purpose of this study was to explore relationships between TTM variables and to examine the mediating effects of self-efficacy on the relationships between predictor variables (Decisional balance and processes of change) and the outcome variable (Stages of change).

MATERIALS AND METHODS

This cross-sectional study was conducted with participation of 300 nursing and midwifery staff from educational hospitals of Ardabil, Iran. For selecting people to participate in research, we mixed the Quota sampling and systematic random sampling methods. First, based on the total research sample, the quota of sample for each hospital was determined from the total sample. Then according to the full list of the nurses and midwives employed in five educational hospitals, the individuals were selected according to proportional number by systematic random sampling method. In this study, we met the ethical issues including freedom and discretion to participate in research, confidentiality of information and explanation of the objectives of study for the participants at the beginning of the research. Also, the informed consent form was obtained from all participants. The data were analysed by SPSS 19 using the descriptive statistics, Spearman correlation test and multiple logistic regression analysis, in which $p < 0.05$ was considered as a significant level.

The instruments used in the study included stage of change algorithm and the questionnaire for measuring the processes of change (Cognitive, behavioural), decisional balance (pros, cons) and self-efficacy. The stage of change algorithm consists of two questions with four subscales to determine the five stages of the behavioural change in the consumption of fruits and vegetables.⁽¹⁴⁾ Each question was

measured with five ordinal questions that were scored on a 5-point Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree). Each question asked whether staff were in the precontemplation, contemplation, preparation, action or maintenance stage. The validity of this scale was confirmed by the expert panel method and its reliability was confirmed by a two-week test-retest with a correlation of 0.87 in previous study.⁽¹⁴⁾ Based on the options of this scale at the precontemplation stage, samples do not pay attention to consume five servings of fruits and vegetables in a day. At the contemplation stage, subjects think about taking fruits and vegetables five servings in a day for the next six months. At preparation stage, subjects think about taking five servings of fruits and vegetables daily for the next 30 days. At action stage, subjects eat fruits and vegetables five servings per day for the six months. At the maintenance stage, subjects consume fruits and vegetables at regular five servings for more than six months.⁽⁹⁾

The Processes of Change scale determine two group processes (Cognitive or Behavioural) across the stages of change of fruits and vegetables consumption and includes 20 questions. Of these, ten questions are related to the cognitive process including consciousness raising, dramatic relief, environmental re-evaluation, self-re-evaluation and social liberation. Also, ten questions are related to behavioural processes including self-liberation, counter conditioning, helping relationships, reinforcement management and stimulus control. Two questions provided for each process in the 5-state Likert scale from "never" equal⁽¹⁾ to "always" equal.⁽⁵⁾ In the study of Khezeli et al, panel of experts approved Content Validity Index (CVI) and Content Validity Ratio (CVR) of items. In addition, the internal consistency of process of changing questions using Cronbach's Alpha has been reported as 0.73.⁽¹⁵⁾

To measure individual self-efficacy in fruits and vegetables consumption 5 questions were considered, which were assessed on a 5-point scale with a total score of 5 to 25. Validity of questions was confirmed by panel expert and correlation coefficient of scale with Cronbach's alpha of 0.84.

In the scale of decisional balance, two important sub-scale was measured including perceived benefits and perceived barriers. For each of these subscales, five questions were included in the questionnaire, in which results of subtraction of these two subscale showed the decision balance. Participants were asked to rate the questions using a 5-point Likert scale including "it is not important at all,"⁽¹⁾ to "extremely important."⁽⁵⁾ The internal coefficient of questions was calculated with Cronbach's alpha, which was 0.70 for perceived benefits and 0.74 for perceived barriers.

Descriptive statistics were used to describe the participant's general characteristics. The correlation analysis was used to determine the relationships between variables. Multiple logistic regression to examine the mediating effects of self-efficacy in the stages of change model in the following three situations: (1) The regression of the mediating effects of self-efficacy on predictive variables (Behavioural processes and decisional balance); (2) The regression of the effects of dependent variable (Stages of change) on predictor variables (Behavioural processes and decisional balance); and (3) The regression of effects of the dependent variable (Stages of change) on mediator (Self-efficacy) and predictor variables (Behavioural processes and decisional balance).

RESULTS

The descriptive analysis showed that 218 (73%) of the samples were married and 124 (41.34%) of the subjects had a natural body index. 259 (86.34%) were undergraduate and 17 (5.7%) graduate students. A third of the participants in the study also worked in the intensive care unit and operating room. Considering the structure of the stages of change in the of Transtheoretical model 118 (39.3%) were in the precontemplation stage, 60 (20%) at the contemplation stage, 54 (18%) at the preparation stage, 18 (6%) in the action stage and 50 (16.7%) were in the maintenance stage.

Correlation between Process of Change, Decisional Balance and Self-Efficacy

The results of correlation analysis showed that cognitive processes of change, self-efficacy and consensus views of the decisional balance (Cons) were strongly correlated with the structure of the stages of change ($p < 0.01$). The cognitive

processes were related to decisional balance and self-efficacy structures. Also, self-efficacy according to our hypothesis had a high correlation with all structures of the Transtheoretical Model (Table 1).

Multiple Logistic Regression Analysis of Self-Efficacy Mediation Effects

Multiple regression analysis was conducted to determine the mediating effects of self-efficacy in the relationship of the process of change with stages of change and also decisional balance with the stages of change (Chart 1 and 2) and results showed that the process of change is not a suitable predictor for the stages change stage ($\beta = .052, p = .115$), but due to the mediating effects of it can affect the stages of change ($\beta = .369, p = 0.001$). Also, the decisional balance that had a significant correlation with the stages of change ($\beta = -.248, p = 0.001$) had a double effect on the stages of change with the mediating effect of self-efficacy ($\beta = -0.419, p = 0.001$).

Variables	Stages of Change	Cognitive Processes	Behavioural Processes	Perceived Benefits	Perceived Barriers
Process of Change	Cognitive	.168**			
	Behavioural	.080	.732**		
Decisional Balance	Perceived benefits	.138*	.507**	.491**	
	Perceived barriers	-.178**	-.377**	-.310**	-.662**
Self-Efficacy		.352**	.176**	.295**	.175**

Table 1. Correlation between Stages of Change, Process of Change, Decisional Balance, and Self-Efficacy of Fruit and Vegetable Consumption in Subjects

(**) represents a significant level of 0.01 and (*) indicates a significant level of 0.05.

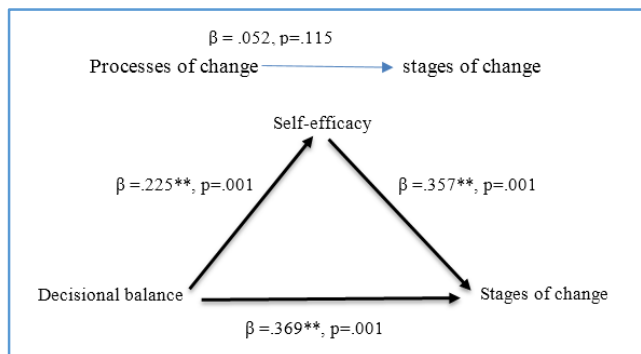


Figure 1. Mediating Effects of Self-Efficacy on Relationship between Processes of Change and Stages of Change

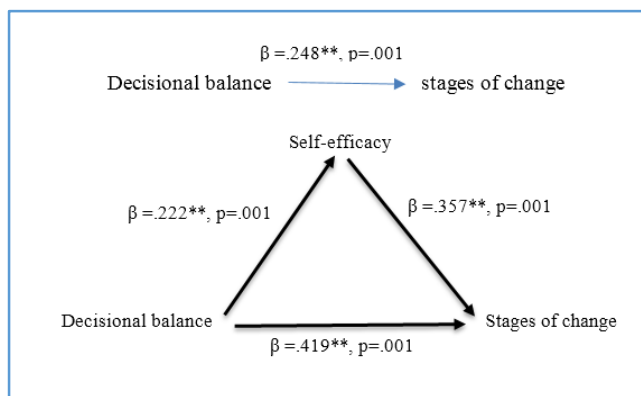


Figure 2. Mediating Effects of Self-Efficacy on the Relationship between Decisional Balance and Stages of Change

DISCUSSION

The results of this study showed that self-efficacy was the strongest predictor of consumption of fruits and vegetables among nursing and midwifery staff and then decisional balance was considered as another effective predictor. A similar study among students showed that self-efficacy was an appropriate predictor and mediator for improving the consumption of fruits and vegetables, which was consistent with the present study.⁽¹⁶⁾ Another study in students showed that self-efficacy was considered as the strongest predictor of consumption of fruits and vegetables, which was in line with the study.⁽¹⁷⁾ In another study that was conducted in Bandar Abbas among high school students consistent with the present study, the decisional balance (Perceived benefits and perceived barriers) and self-efficacy were the strong predictors of the stages of change for consumption of fruits and vegetables.⁽¹⁸⁾ Contrary to the Noia and Prochaska study, in which the decisional balance were the most influential variables to promote fruit and vegetable consumption among African-American youth⁽¹⁹⁾ in our study, self-efficacy was the strongest mediator of promoting fruit and vegetable consumption among nursing and midwifery staffs. In the study of Horwath et al, the self-liberation was introduced as the strongest structure for change, which was inconsistent with the present study.⁽²⁰⁾ In most studies, the results suggested the use of sound health education and health promotion models for changing and adopting behaviours by individuals.^(20,21) Therefore, in order to promote any behaviour in different groups and societies, these groups should be studied and their stages of change should be determined. Then depending on the stages of change, the processes of change, decisional balance and self-efficacy of

the subjects, the appropriate measures should be done to promote the effectiveness of the actions.

Given the self-reporting for data gathering in the present study using the questionnaires, there is the possibility of desirability and bias due to the nature of the tool. Therefore, we suggest that in subsequent studies, other information gathering methods should be used in conjunction with the questionnaire to reduce the possibility of bias.

CONCLUSION

This study showed a strong correlation between self-efficacy, decisional balance and processes of change with stages of change and the mediating effects of self-efficacy on the relationship of other structures on improving the stages of change for consumption of fruits and vegetables. Considering these relationships, we suggest that in order to increase the amount of fruit and vegetable consumption in the nursing and midwifery staff of Ardabil Educational Centers, self-efficacy and cognitive processes should be considered as the basis of the program. Future studies should attempt to identify variables that strengthen the relationship between attitude-behaviour for different types of behaviours in order to provide clues for effective intervention strategies. Also, in the regression relationships between the structures of the transtheoretical model with the stages of change respectively, self-efficacy, perceived barriers and cognitive processes were significant predictors that could be considered in order to make more effective interventions for increasing the consumption of fruits and vegetables.

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