

Assessing Stages of Exercise Behavior Change, Self Efficacy and Decisional Balance in Iranian Nursing and Midwifery Students

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ABSTRACT

Background

Regular physical activity contributes positively to physiological and psychological health. This study aimed to identify exercise behavior changes, self efficacy and decisional balance in nursing and midwifery students.

Methods

This is a cross-sectional study carried out in Iran. All undergraduate nursing and midwifery students (n=300) participated in this study. Data were collected using a standard questionnaire developed by Wakui including demographic information, exercise stages of change (using a 5-item, dichotomous (Yes/No) scale), exercise self efficacy (5 item using Likert scale) and exercise decisional balance (12 item using Likert scale). Validity and reliability was checked by the panel of experts and test retest correlation, respectively. Descriptive statistics (frequency and percentage) and analytical tests (Correlation, independent t-test, one way ANOVA) were used for analysis.

Results

In total, 41 subjects were males (13.6%) and 259 females (86.3%). According to the results, 23.3% of the students were in pre-contemplation, 29% in contemplation, 32.6% in preparation, 7.3% in action and 7.3% in maintenance stages of changes in exercise behaviors. Significant differences were found in the individual efficacy scores, pros and cons of decisional balance in different stages of changes of exercise behavior. Significant differences were found between the pre-contemplation and other groups by post-hoc follow up test ($P < 0.05$). No significant differences were found between nursing and midwifery students in SECCQ scores and also between academic year, and self efficacy and pros and cons of decisional balance scores ($P > 0.05$).

Conclusion

This study showed that a large number of nursing and midwifery students were in the inactive stage. So, exploring effective strategies for directing students from inactive to active stage and motivating them to follow the appropriate exercise behavior seem to be necessary.

KEYWORDS: Exercise; Behavior; Student; Self efficacy

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INTRODUCTION

Nowadays, changes in lifestyle and decreasing physical activity are the risk factors of cardiovascular diseases, non-insulin-dependent diabetes mellitus, osteoporosis, psychological disorder, malignancy, hypertension, colon cancer and obesity.¹⁻⁴ Regular physical activity contributes positively to physiological and psychological health.⁵ Several studies have shown that 80% of Iranian people have no physical activity.⁶ The greatest deterioration in physical activity has been observed between young adults and adults due to lifestyle change that predispose them to lower physical activities.⁷ Although there are different chances in universities for physical exercise, more than 50% of the students are inactive.⁸ No doubt initiating exercise in adolescence can have more benefits for overall healthy lifespan. Disappointing statistics concerning the prevalence of smoking, inactivity and overweight in various social groups, especially students, are the issues that have preoccupied the minds of the researchers.⁹ Therefore, young adults are an important group for intervention to promote physical activities. So, colleges and universities are potentially crucial settings where interventions can be made to help promote exercise throughout lifespan.

Regarding the importance of healthy behavior, different models have been developed to explain why and how people change their lifestyle behavior and adhere to screening programs or their treatment plans. In these models, the individuals are viewed differently and the behavior changing process is affected by different influencing factors based on the perspectives adopted by the theorists. One model that has been applied to exercise behavior successfully is the Transtheoretical Model (TTM) developed by Prochaska and colleagues.^{10,11} This model (TTM) has increasingly been used as the theoretical basis for the development of lifestyle behavior intervention strategies. The TTM assumes that individuals vary in their motivation and readiness to change their behavior. The

TTM has shown a potential as an effective models for understanding exercise behavior among different groups.^{2,5,8,12-16} This model regards behavior changes as a process that involves progression through a series of stages: 1) pre-contemplation (individuals are inactive and do not intend to begin exercise within the next 6 months); 2) contemplation (individuals are inactive and are considering initiating exercise within the next 6 months); 3) preparation (individuals exercise on an irregular basis but intend to become more active within the next month); 4) action (individuals have been engaged in regular exercise for less than six months); and 5) maintenance (individuals have been engaged in regular exercise for six months or more).^{5,10,16-19} Movement through the five stages of change is not in a straight line so that people may relapse to earlier stages several times before they reach the maintenance stage.¹⁰ Different psycho-behavioral patterns are similar to these five stages that help to explore how and why people pass through these stages. Furthermore, it was suggested that stage specific interventions are more successful than non-specific interventions.⁵

Two important components within the Transtheoretical Model are self-efficacy and decisional balance.⁵ These two key components could explain why health behavior changes occur.¹⁶ Self-efficacy is one's perceived confidence in the ability to carry out a specific behavior successfully. An individual's self-efficacy is different in each person and depends on personal circumstances, i.e. sickness, or change in schedule. Self-efficacy steadily increases across the stages of change for exercise. Decisional balance relates to the pros (benefits) and cons (costs) of the behavior as it relates to oneself and significant others. For exercise behavior, the pros increase and the cons decrease across the stages of exercise behavior change.^{5,10,17-19}

Although change in exercise behavior based on this model is considered by

many researchers.^{1,5,12-24} Little is known about exercise stages of change, individual efficacy, and decisional balance in nursing students. Understanding these behaviors among nursing students is very important because they have a key role in changing the behavior of people in society. Besides, the exposure of students in various stages of exercise behavior change could reflect the level of their knowledge and attitude in behavior change of exercise as one of the important healthy lifestyles.

So, this study aimed to identify exercise behavior changes in nursing students at various stages according to socio-demographic variables (age, sex, marital status, and years of education and BMI) and to determine the efficacy and decisional balance toward exercise behavior in them.

METHODS

This was a cross-sectional study carried out during August-December 2011 in Shiraz University of Medical Sciences, Iran. All undergraduate nursing and midwifery students (n=300) participated in this study. Students' participation was voluntary and anonymity was assured. Data were collected using a questionnaire including demographic information (age, sex, marital status, academic year and BMI), exercise stages of change, exercise self efficacy and pros and cons exercise decisional balance. Students were guided by a trained individual to complete the questionnaire. It was developed by Wakui et al. (2002),⁵ and included the measures described below. Stages of exercise behavior change were assessed using a 5-item, dichotomous (Yes/No) scale. A five item scale was used to assess self-efficacy and Likert scale was used to rate each item, from "completely agree" to "don't agree at all". The 12-item decisional balance (6 pros and 6 cons) was used in this study, being rated on a 5-point Likert-type scale. It was translated into Persian and back-translated to English by a professional translator and validated by an expert panel. Spearman correlation coefficient was 0.98,

using test-retest reliability for stages of exercise behavior. A Cronbach's alpha of about 0.86 was reported for internal consistency of the exercise self efficacy, and 0.82 for pros and 0.79 for cons exercise decisional balance.

Body weight was measured (in light clothing and with bare feet) to the nearest 0.1 kg, and the height was measured in bare feet and without hair ornaments to the nearest 0.5 cm. Measurements were performed by the same trained individual. BMI was calculated by dividing weight (kg) by height squared (m²).

This study was approved by the research and ethics committee of Shiraz University of Medical Sciences. Data were summarized as mean (standard deviation), or frequency and percentage. Exercise efficacy score, and pros and cons of exercise decisional balance were compared using one way ANOVA. Post-hoc test was used for Tukey comparison. Self-efficacy and pros and cons of decisional balance among nursing and midwifery students and academic year were compared subsequently using independent t-test and one-way ANOVA. Correlation of Measure of SECQ with field study (Nursing and Midwifery) and different academic years (first to forth) was assessed through Chi-square test. The analysis was performed using SPSS statistical software, version 13 (SPSS Inc, Chicago USA). A p-value of less than 0.05 was considered as statistically significant.

RESULTS

The results showed that the mean age of the students was 21.5 years (SD=2.1). The other demographic information of students is summarized and presented in table 1. Detailed demographic data according to stages of change in exercise behaviors are reported in table 2. According to the results, 23.3% of the students were in pre-contemplation, 29% in contemplation, 32.6% in preparation, 7.3% in action, and 7.3% in maintenance stages of changes in exercise behaviors.

Table 1: Demographic information of students

	Variables	Frequency	Percent
Sex	Female	259	86.3
	Male	41	13.7
Age (year)	≤20	117	39
	>20	183	61
Marital Status	Single	266	88.7
	Married	31	10.3
	divorced	3	1
Academic year	First	71	23.7
	Second	77	25.7
	Third	85	28.3
	Forth	67	22.3
BMI (kg/m ²)	≤18.5	39	13
	18.5-24.9	234	78
	>25	27	9
Field study	Nursing	222	74
	Midwifery	78	26
	Total	300	100

Table2: Distribution of characteristics of students on stages of exercise behavior change

Variables		Stages of exercise behavior change									
		PC		C		PR		AC		MT	
		Freq	Per	Freq	Per	Freq	Per	Freq	Per	Freq	Per
Sex	Female	65	25.1	74	28.6	83	32	17	6.6	20	7.7
	Male	5	12.2	13	31.7	15	36.6	5	12.2	3	7.3
Age (year)	≤20	26	22.2	33	28.2	42	36	8	6.8	8	6.8
	>20	44	24	54	29.5	56	30.6	13	7.1	16	8.8
Marital Status	Single	57	21.4	74	27.8	92	34.6	21	7.9	22	8.3
	Married	13	41.9	11	35.5	5	16.1	2	6.5	0	0
	Divorced	0	0	2	66.7	1	33.3	0	0	0	0
Academic Year	First	14	19.7	26	36.7	23	32.4	5	7	3	4.2
	Second	14	19.7	26	36.7	23	32.4	5	7	3	4.2
	Third	20	23.5	29	34.1	23	27.1	9	10.6	4	4.7
	Forth	14	20.9	15	22.4	28	41.8	2	3	8	11.9
BMI(kg/m ²)	≤18.5	9	23.1	12	30.8	13	33.3	1	2.5	4	10.3
	18.5-24.9	58	24.8	67	28.6	73	31.2	18	7.7	18	7.7
	>25	3	11.1	8	29.6	14	51.9	2	7.4	0	0
Field study	Nursing	52	23.4	67	30.2	72	32.4	15	6.8	16	7.2
	Midwifery	18	23.1	20	25.6	28	35.9	6	7.7	6	7.7
	Total	70	23/3	87	29	98	32.6	22	7.3	22	7.3

Stages of change for exercise behaviors PC=Precontemplation; C=Contemplation; PR=Preparation; AC=Action; MT=Maintenance.

Significant differences were found in the individual efficacy scores, and pros and cons of decisional balance in different stages of changes in exercise behavior. Total sample's scoring on each scale and the results of the one-way ANOVA are shown in table 3. Post-hoc follow up testing showed significant differences between the precontemplation and other groups (contemplation, preparation,

action and maintenance). No significant differences were found between nursing and midwifery students in SECQ scores and also between academic year, and self efficacy and pros and cons of decisional balance scores ($P>0.05$). Chi-square test results showed that there were no differences between the field of study and SECQ, and also between academic year and SECQ.

Table 3: Comparison of students' self-efficacy, decisional balance (pros & cons) mean scores in stages of exercise behavior change

Variable	Stages of exercise behavior change										Tukeys HSD (P<0.05)		
	PC (n=70)		C (n=87)		PR (n=98)		AC (n=21)		MT (n=22)				
	M	SD	M	SD	M	SD	M	SD	M	SD			
Exercise self-efficacy	1.78	1.02	2.43	0.99	2.71	1.06	3.28	1.03	3.78	0.81	17.36	0.000	PC<C<PR<AC<MT
Decisional balance													
Pros	3.83	0.62	4.28	0.48	4.37	0.60	4.45	0.58	4.54	0.39	7.68	0.000	PC<C<PR<AC<MT
Cons	3.25	0.75	2.80	0.69	2.71	0.73	2.27	0.81	2.21	0.66	10.78	0.000	PC<C<PR<AC<MT

Stages of change for exercise behaviors PC=Precontemplation; C=Contemplation; PR=Preparation; AC=Action; MT=Maintenance. Comparisons were made using analyses of variance. Posthoc comparisons were made using the Tukey procedure. Tukey comparisons that were significant are indicated by the "<".

DISCUSSION

This study showed that a large number of nursing and midwifery students were in the inactive stage (precontemplation, contemplation and preparation). These findings are consistent with Irwin et al. study. They showed that more than one-half of university students in the United States and Canada are not active enough to gain health benefits.⁸ Healthy lifestyle is very important during adolescence and early adulthood especially in nursing and midwifery students. In addition, they have a key role in changing behavior of people in society. So, improving these exercise behaviors is a priority.

In this study, approximately 86.3% of the students were females, being in contemplation and preparation stages of exercise behavior change. Irwin et al. found that women, and especially African-American women, are among the least active students.⁸ Furthermore, Emdadi et al. found that 73.2% of the female students were in pre-contemplation, contemplation and preparation stages.²⁵ Although female students were not sufficiently active, it is crucial to find factors that influence their decision about the choice to be active. This is more important when we consider their future roles in promoting healthy behaviors in the community as well as in their personal life.

In addition, the study showed that single students were in preparation stage and married ones were in precontemplation

and contemplation stages of exercise behavior change. The finding that most of the married students were in inactive stage is consistent with the result of the study by Lee et al.¹⁶ It can be inferred that single students were trying to have a good body image for finding appropriate partner. Another point worth mentioning is the possibility of weight control of the subjects by just adherence to diet regimen without complying exercise as most of the students' BMI is in an acceptable range.

An outstanding result of this study is that even overweight students (BMI>25 kg/m²) were in the preparation stage (51.9%). It can be deduced that these individual were aware of benefits and cost of changing of behavior and had a plan of action, but they probably didn't have sufficient will power, time, place, money, etc. to do physical activity. This awareness could be the result of their education in nursing and midwifery field while they pass different courses in health sciences. However, there are some evidence in support of the effectiveness of providing specific courses such as health-related physical fitness in addition to the traditional courses in the improvement of exercise stages and perceived exercise benefit.²⁶

According to our results, more than 50% of the students were in the inactive stage (23.3% in precontemplation 29% in contemplation and 32.6% in preparation stages). Other studies show that people in

the pre-contemplation stage do not intend to take action in the foreseeable future and they are uninformed or under-informed about the pros and cons of the current behavior change. These people don't have the ability to understand or analyze benefits and costs for progressing to advance stages; therefore, they stay in this stage for a long time and even don't think about changing the current behavior.¹⁰

However, people in the contemplation stage intend to change in the next 6 months. They are more aware of the pros and cons of changing, and others who are in the preparation stage have a plan of action.¹⁰ Although 61.6 % of the students were in contemplation and preparation stages, they may relapse to previous stages because of lack of time, will power, support, motivation, place, and money.²⁷ Considering that only totally 14.6% of the students are in action and maintenance stages, it is a warning for university officials to intervene promptly. Furthermore, large prospective longitudinal studies are needed to find the characteristics of people in the active stage while controlling confounding variables in order to be used in interventional programs.

The result of comparison of stages of exercise behavior change showed that self efficacy significantly increased as it progressed from precontemplation through the stages of contemplation, preparation, action and maintenance. In addition, for decisional balance the subjects in the pre-contemplation stage had significantly lower perceived benefits involved in exercise compared to those in the contemplation, preparation, action and maintenance stages. Also, the mean score of cons was the highest at pre-contemplation and the lowest at maintenance. Significant differences were found across stages of change and it was contrary to the results reported by Wakui et al. and Lee et al. This difference could be due to higher education of the participants in our study compared to Lee et al. study in which only 16.1% were educated.^{5,16} Furthermore,

literature affirmed that there was a positive correlation between obesity and educational status in women (19.4% among illiterate females and 14.2% among high school and university graduate females).²⁸ Therefore, we concluded that improving change strategies as social support system, having exercise action plan and commitment to do it, improving self efficacy, receiving reinforcement and reward and understanding benefits of exercise especially early benefits such as happiness and positive psychological effects, and removing physical barriers such as distance of exercise environment, limited environment, and costs of exercise activity can progress students in the stages of exercise behavior and psychological factors, and improve the stability of these results in them.

Although it was expected that increase of the academic years from the first to forth in nursing and midwifery students improved their knowledge, attitude, motivation and lifestyle, but there was no significant difference between the field of study and stages of exercise behavior change and also between academic year and stages of exercise behavior change ($P>0.05$). Also, no significant differences were found between nursing and midwifery students in SECQ scores and also between academic year and self efficacy and pros and cons of decisional balance scores ($P>0.05$). In another study the model was tested to determine the effect of informed-choice invitation on diabetes screening knowledge, attitude and intention. All the subjects were randomly assigned to receive the informed choice or a standard invitation for diabetes screening. After 2 weeks, their knowledge of the invitation, attitude towards diabetes screening, and intention to attend for diabetes screening were measured. The researchers concluded that although the invitation type can predict knowledge but are not able to predict attitudes towards screening.²⁹

Also, various predictors of intention to screen and screening behaviour have been determined previously and the possible

influence of social ecological factors on screening behaviour has been highlighted.³⁰ Therefore, we can infer that the intention to do healthy behaviours such as exercise in our students may need a more comprehensive approach in our education program. In a study on medical, nursing, midwifery, dentistry, health community students found that most of the students in each educational level were in the contemplation stage.²⁵

The main limitation of the present study was lack of a sample size, not allowing us to do a meaningful evaluation of the large number of variables that can influence exercise behavior.

CONCLUSION

Our results showed that most of nursing and midwifery students were in the inactive stages of exercise behavior change (pre-contemplation, contemplation and preparation) Since these students are prospective service providers and role models for clients, it is necessary to design and implement appropriate interventions based on behavior change model to improve to higher stages of behavior change and stabilize their exercise behavior. Determining the status of the individuals in stages of exercise behavior change is a good reflection of the thinking and practice of individuals in exercise. So, further research should focus on identifying stages of exercise behavior change in other treatment groups and patients because the obtained results could provide contextual information for educational programs on healthy lifestyle. These investigations could help prevent different diseases related to inactivity and promotion of health in community.

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