

Original Article

Comparison of the Effect of Trainings Based on the Transtheoretical Model and the Health Belief Model on Nurses' Smoking Cessation

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Abstract

Objectives: The purpose of this study is to identify and compare the effects of smoking cessation trainings based on Transtheoretical Model and Health Belief Model on nurses' smoking cessation.

Methodology: Among the 214 smoking nurses who worked in Research Hospital and Region Education Hospital, this study was conducted with a total number of 96 volunteer nurses- 29 nurses from Region Education Hospital and 67 nurses from Research Hospital.

Results: After the training, 15% of the nurses in the HBM group passed to the action stage, and 7% of those in the TTM group passed to the action stage and 11.6% to the maintenance stage. This progress in the stages of change was found to be statistically significant. No significant differences were detected between the groups in terms of their scale mean scores. Negative attitudes about smoking mean score belonging to the HBM group was significantly higher than that of the TTM group.

Conclusions: HBM and TTM-based trainings were found to have positive effects both on progressive actions and cigarette cessation for 6 months or more. TTM-based trainings were found to be more effective in smoking cessation.

Key Words: Health Belief Model, Smoking, Transtheoretical Model

Introduction

Smoking is still one of the most important and preventable public health problems for all countries (Republic of Turkey Ministry of Health, 2008; WHO, 2009; Onusuz, Topuzoglu, Algan, Soydemir, & Aslan, 2009). Beside its easy access and legal use, cigarette's hazardous effects have not been emphasized adequately and thus smoking rates have continued to increase worldwide. Long after this increased ratio of smoking, seriousness of the issue has been demonstrated by its associations with diseases such as ischemic heart diseases, cerebrovascular diseases, chronic obstructive pulmonary disease (COPD), tuberculosis, lung cancer, gastric cancer, liver cancer, and also with death (WHO, 2010).

Tobacco use, defined by the World Health Organization (WHO) as "the epidemic that

spreads fastest and lasts longest" is the cause of one out of 10 adult deaths worldwide. Every year, 6 million people lose their lives due to tobacco use. Of these people, more than 600 thousand are passive smokers who do not smoke; more than 5 million are those who use tobacco (WHO, 2015). If necessary precautions are not taken for reducing tobacco use, this number will reach to 8 million people annually in 2030 (WHO, 2010). Tobacco is an important risk factor for cardiovascular diseases and cancer, which are the leading causes of premature death. Additionally, it is a dominant factor in the development of respiratory system diseases such as COPD (U.S. Department of Health And Human Services, 2014).

It is not only active smokers who get sick or die due to tobacco. Passive smokers also have severe and frequent health problems. In the United

States of America, being passive smokers caused 430 sudden infant death syndromes, 200.000 asthma attacks in childhood, 71.900 premature births, and 24.500 low birth weight babies in one year. Besides, 3400 people lost their lives due to lung cancer, and 46.000 people due to heart diseases (WHO, 2010). In addition to being a cause of a deadly disease, smoking is strongly addictive in nature. Cigarette addicts can go on smoking despite the risk of losing their health as well as other people's getting harmed by it (Durmus & Pirincci, 2009). 1.2 billion people worldwide who are aged over 15 are tobacco addicts, and 80% of them are in the developing countries (Republic of Turkey Ministry of Health, 2008; WHO, 2015). According to 2008 data in the European countries, smoking prevalence was found 24.2% on the average (Republic of Turkey Ministry for EU Affairs, 2011). According to the results of the "Turkish Adult Tobacco Research" conducted in our country in 2008, smoking prevalence was found 31.3%; with 47.9% and 15.2% for males and females respectively (Turkish Statistical Institute, 2008). There has been a decrease in the tobacco use proportions in our country with the precautions taken after the "Framework Convention on Tobacco Control" signed in 2004 by the Minister of Health at that time, and this was followed by the "National Tobacco Control Program" that aimed to restrain tobacco use. According to the "Adult Tobacco Survey Turkey" conducted in 2012, smoking prevalence was 27.1%, with 41.4% and 13.1% for males and females respectively (Turkish Statistical Institute, 2012). OECD 2014 report indicates that smoking prevalence decreased to 23,8% in Turkey, with 37.3% and 10,7% for males and females respectively (OECD, 2014).

Health professionals are expected to take active roles in fighting against smoking and to be role models for people; they also have the power to affect people they provide care in terms of health training. However, smoking prevalence among healthcare professionals is no different from the general population. Smoking prevalence worldwide was reported to be between 1.3% and 44.8% for doctors and between 6% and 43 % for nurses (Talay, Altin, & Cetinkaya, 2007). Smoking rate among nurses in our country is reported to be between 29.5% and 68.6% (Ozturk, 2009). Temel et al. found this proportion as 46% in their study conducted in 2009 (Temel, Coskun, Gok, Celik, & Yorgancioglu, 2009). The

study conducted by American Centre for Disease Prevention and Control, Ministry of Health, and Association of Public Health Professionals in 2008 involved 4761 participants and identified smoking prevalence among nurses as 40.7% (Aslan, Bilir, & Ozcebe, 2008). Nurses were found to smoke mostly in hospital and also be exposed to passive smoking (Temel, Coskun, Gok, Celik, & Yorgancioglu, 2009; Aylaz, Hacıevliyagil, & Durdu, 2008).

Smoking has operant and classical conditioning processes on its base. Smoking cessation can only be possible if conditioning ceases in time. Therefore, the process of smoking cessation requires behavioral change (Turkish Thoracic Society, 2011).

The Transtheoretical Model (TTM), which is used today as a guide in enhancing behavioral change, is a conscious behavioral change model. According to the TTM, behavioral change is a process, and the interventions performed appropriately according to the individual's stage of change enhance this behavioral change. Otherwise, one develops resistance to behavioral change (Prochaska, & Velicer, 1997). The TTM was designed with the integration of principles and processes of TTM psychotherapy and behavioral changes theories.

Another model commonly used for learning health behaviours is Health Belief Model (HBM). This model explains the relationship between a person's beliefs and behaviours and the effects of individual motivation on health behaviours at decision-making level. In HBM, which is a mainly cognitive approach, the individual is claimed to demonstrate preventive health behaviours when they perceive a threat against their health or reap the benefit of some interventions that prevent health threat (Gozum, & Capık, 2014).

Purpose

The present study aims to identify and compare the effects of trainings based on the Transtheoretical Model and Health Belief Model on nurses' smoking cessation.

Methodology

Research Design

This study was designed with two different intervention groups and as pre-test post-test experimental one.

Target Population and the Participants

Target population of this study was 214 smoking nurses who worked in Region Education Hospital and Research Hospital. The participants were a total number of 96 volunteer nurses, 29 nurses from Region Education Hospital and 67 nurses from Research Hospital.

The group that was provided with training based on the Health Belief Model (HBM) was formed with 29 nurses who worked in Region Education Hospital; and the group that was provided with training based on the TTM was formed with 67 nurses who worked in Research Hospital.

Throughout the study process, a total number of 33 participants- 9 in the HBM group and 24 in the TTM group- dropped out of the study due to such reasons as appointment to a different place of duty, health problems, and the perception about the long duration of the trainings.

Data Collection

The data were collected between 1st of May, 2012 and 3rd of June, 2013, using Participant Identification Form, Fagerstrom Test for Nicotine Dependence, Stages of Change Scale, Process of Behavioral Change Scale, Self-efficacy Scale, Temptation Scale and Decisional Balance Scale via face-to-face interviews conducted by the researcher. The nurses were visited by the researcher in the hospitals they worked in the 1st, 3rd, 6th, and 12th months.

Pre-test data were obtained when all the data collection tools were administered to the participants by the researcher in the first month (in the first visit), a few days before the trainings.

In the third month (in the second visit); following the first training, the participants were administered "Stages of Change Scale" through face-to-face interviews conducted by the researcher. The first interim test data were obtained and the second training was administered.

In the sixth month (in the third visit); following the second training, the researcher administered "Stages of Change Scale" through face-to-face interviews in order to collect the second interim test data, and the third training was given.

In the twelfth month (in the fourth visit), once the trainings were completed, post-test data were obtained by administering all the data collection

tools except for the Participant Identification Form.

Participant Identification Form: the form, which was prepared by the researcher in line with the related literature, included 16 questions (Kutlu, Marakoglu, & Civi, 2005, Okutan, Tas, Kaya, & Kartaloglu, 2007, Erbaycu, Aksel, Cakan, & Ozsoz, 2004).

Fagerstrom Test for Nicotine Dependence: Fagerstrom Test for Nicotine Dependence was developed by Karl O. Fagerstrom in 1989 with a view to identifying the level of physical dependence on cigarette (Fagerstrom, & Schneider, 1989). Reliability and factor analysis of the Turkish version was tested by Uysal et al., (2004) in our country.

Stages of Change Scale: the scale, which was developed by Pallonen et al. in 1998, indicates the stages of change experienced by individuals who try to change their problematic behaviors (Pallonen, Prochaska, Velicer, Prokhorov, & Smith, 1998). The scale was adapted to Turkish by Erol in our country (Erol, & Erdogan, 2008).

Process of Behavioral Change Scale: the scale was developed by Prochaska et al. in 1988. The scale demonstrates the processes the individual goes through in the stages of behavioral changes (Prochaska, Velicer, DiClemente, & Fava, 1988). Validity and reliability of the scale was determined by Erol in our country (Erol, & Erdogan, 2008).

Self-Efficacy Scale: it was developed by Wayne F. Velicer et al. in 1990 (Velicer, DiClemente, Rossi, & Prochaska, 1990). It reflects an individual's self-confidence in case of difficult situations in order not to return to the risky behavior s/he changed. The scale was adapted to Turkish by Erol in our country (Erol, & Erdogan, 2008).

Temptation Scale: the scale was developed by Wayne F. Velicer et al. in 1990 (Velicer, DiClemente, Rossi, & Prochaska, 1990). It reflects the intensity of the encouraging factors that make the individual return to his/her risky behavior. The scale was adapted to Turkish by Erol in our country (Erol, & Erdogan, 2008).

Decisional Balance Scale: The scale, which was developed by Wayne F. Velicer et al. in 1985, is composed of two sub-dimensions that reveal perceptions about the positive and negative sides of smoking (Velicer, DiClemente, Prochaska, &

Brandenburg, 1985). Validity and reliability of the scale was performed by Yalcikaya in our country (Yalcikaya-Alkar, & Karanci, 2007).

Nursing Intervention

The nurses in the HBM group were provided trainings for one hour daily, throughout three days. The nurses in the TTM group were provided one hour training daily for one day for each stage, depending on the stage they were in according to the pre and post test data (Figure 1).

Variables of the Study

Independent variables of the study were the trainings based on the Health Belief and Transtheoretical models. Dependent variables for both groups were stages of change, self-efficacy, and level of nicotine dependence. Dependent variables for the HBM group were health beliefs, threat, benefit, and perception of obstacles; and those of for the TTM group were process of behavioral change and encouragement. Control variables of the study included age, gender, marital status, education level, years of working, type of working, years of smoking, having a child aged between 0 and 6, presence of a family member or friend who smokes, and level of nicotine dependence.

Data Analysis

The data were analyzed using SPSS package programming, using chi-square test, Friedman test, t-test for independent groups and paired samples t-test.

Ethical Considerations

Approval of Institute of Medical Sciences Ethics Committee and written permission from Region Education Hospital and Research Hospital were obtained prior to the study. Verbal consent of the nurses who wanted to participate in the study was also received.

Results

The groups were similar in terms age, gender, marital status, education level, years of smoking, having a child aged between 0 and 6, presence of a family member or friend who smokes, and level of nicotine dependence (Table 1).

Average age of the HBM group was found 29.93 ± 5.2 and 75.9 % were female and 62.1% were male; 58.6% had bachelor's degree. As for the TTM group, average age of the participants

was found 32.24 ± 7.4 ; and 89.6% were female, 62.7% were married, and 38.8% had bachelor's degree. Of the nurses in the HBM group, 34.5% worked in the operating rooms and 34.5% worked in intensive care units. As for the ones in the TTM group, 23.9% worked in the operating rooms and 20.9% worked in internal clinics. It was found that working years of the 58.6 % of the participants in the HBM group and 22.4 % of those in the TTM group were less than 5 years. As for working type, 37.9% of the nurses in the HBM group worked always daytime and 37.9 % worked always at night. As for those in the TTM group, 58.2% worked always daytime and 37.3% worked only at night. In both groups, there were nurses who had been smoking for more than 20 years, and the age of regular smoking onset was generally 16 and over. 13.8% of participants in the HBM group and 19.4% of those in the TTM group were heavy smokers, 62.1% of the participants in the HBM group and 73.1% of those in the TTM group were found to have tried to give up smoking before. 31% of those in the HBM group and 37.3% of those in the TTM group had a child aged between 0 and 6. Both groups had a family member who smoked (HBM:82.8%, TTM:76.1%). 96.6% of the participants in the HBM group and 98.5% of the participants in the TTM group had a friend who smoked (Table 2).

According to the mean scores of the data collection tools, changes detected were not statistically significant after the training in the HBM group (Table 3).

The increase in the Process of Behavioral Change Scale mean scores and the decrease in the Positive attitudes about smoking mean scores of the TTM group after the training were found to be statistically significant ($p < 0.01$). The increase in the Self-efficacy scale mean scores and the decrease in the Temptation Scale were found to be statistically significant ($p < 0.05$) (Table 3).

A 15% of the participants in the HBM group was at the action stage after the training, and the movements between the stages of change were statistically significant ($p < 0.05$) (Table 4). After the training, 7% of the TTM group participants were at the action stage, 11.6% were at the maintenance stage, and the movements between the stages of change were statistically significant ($p < 0.05$) (Table 4).

Table 1. Control Variables of the Study

Control Variables		HBM Group Pre test		TTM Group Pre test		x ²	P
		S	%	S	%		
Gender	Male	7	24.1	7	10.4	3.04	>0.05
	Female	22	75.9	60	89.6		
Marital Status	Married	18	62.1	42	62.7	.00	>0.05
	Single	11	37.9	25	37.3		
Education Level	High School	6	20.7	23	34.3	4.88	>0.05
	Associate degree	6	20.7	18	26.9		
	Bachelor's degree	17	58.6	26	38.8		
Years of Working	5 years and less	17	58.6	15	22.4	12.67	<0.05
	6-10 years	5	17.2	17	25.4		
	11-15 years	2	6.9	16	23.9		
	16 years and more	5	17.2	19	28.4		
Type of Working	Always at night	11	37.9	25	37.3	9.11	<0.05
	Always Daytime	11	37.9	39	58.2		
	Daytime and Occasional shifts	7	24.1	3	4.5		
Years of Smoking	1-5 years	6	20.7	17	25.4	2.82	>0.05
	6-10 years	11	37.9	16	23.9		
	11-15 years	7	24.1	17	25.4		
	16-20 years	4	13.8	10	14.9		
	21 years and more	1	3.4	7	10.4		
Having a child aged between 0 and 6	Yes	9	31	25	37.3	.34	>0.05
	No	20	69	42	62.7		
Having a smoking family member	Yes	24	82.8	51	76.1	.52	>0.05
	No	5	17.2	16	23.9		
Having a friend who smokes	Yes	28	96.6	66	98.5	.37	>0.05
	No	1	3.4	1	1.5		
		X±SD		X±SD		t	P
Age		29.93±5.2		32.24±7.4		1.53	>0.05
Fagerstrom Test for Nicotine Dependence		2.69±1.5		2.34±1.5		1.03	>0.05

Table 2. Descriptive Features of the Nurses

		HBM Group		TTM Group	
		S	%	S	%
Gender	Male	7	24.1	7	10.4
	Female	22	75.9	60	89.6
Marital Status	Married	18	62.1	42	62.7
	Single	11	37.9	25	37.3
Education Level	High School	6	20.7	23	34.3
	Associate degree	6	20.7	18	26.9
	Bachelor's degree	17	58.6	26	38.8
Working Unit	Internal Units	-	-	14	20.9
	Surgical Units	8	27.6	4	6.0
	Operating room	10	34.5	16	23.9
	Intensive Care	10	34.5	10	14.9
	Management	-	-	1	1.5
	Pediatrics	-	-	12	17.9
	Other	1	3.4	10	14.9
Years of Working	5 years and less	17	58.6	15	22.4
	6-10 years	5	17.2	17	25.4
	11-15 years	2	6.9	16	23.9
	16 years and more	5	17.2	19	28.4
Type of Working	Always at night	11	37.9	25	37.3
	Always Daytime	11	37.9	39	58.2
	Daytime and Occasional shifts	7	24.1	3	4.5
Years of Smoking	1-5 years	6	20.7	17	25.4
	6-10 years	11	37.9	16	23.9
	11-15 years	7	24.1	17	25.4
	16-20 years	4	13.8	10	14.9
	21 years and more	1	3.4	7	10.4
Age of regular smoking onset	10 and below			2	3.0
	11-15	2	6.9	4	6.0
	16-20	16	55.2	30	44.8

	21 and over	11	37.9	31	46.3
	5 and below	3	10.3	15	22.4
Number of cigarettes smoked daily	6-10	9	31.0	15	22.4
	11-15	5	17.2	9	13.4
	16-20	8	27.6	15	22.4
	21 and above	4	13.8	13	19.4
Having tried to give up smoking before	Yes	18	62.1	49	73.1
	No	11	37.9	18	26.9
Having a child aged between 0 and 6	Yes	9	31	25	37.3
	No	20	69	42	62.7
Having a smoking family member	Yes	24	82.8	51	76.1
	No	5	17.2	16	23.9
Having a friend who smokes	Yes	28	96.6	66	98.5
	No	1	3.4	1	1.5
			X±SD		X±SD
Age			29.93±5.2		32.24±7.4

Table 3. Comparison of the Scale Mean Scores Before and After the Training in the HBM and TTM Groups

Scales and Sub-scales	HBM				TTM			
	Pre test X±SD	Post test X±SD	t*	P	Pre test X±SD	Post test X±SD	t	P
Fagerstrom Test for Nicotine Dependence	2.69±1.5	2.35±1.5	1.67	>0.05	2.34±1.5	2.16±1.6	1.14	>0.05
Process of Behavioral Change Scale	69.24±13.1	76.30±11.5	1.50	>0.05	64.90±14.4	77.16±13.2	5.89	<0.01
Self-efficacy Scale	22.03±6.7	25.30±8.2	.98	>0.05	22.39±7.8	25.53±8.5	2.23	<0.05
Temptation Scale	25.97±6.7	22.60±8.3	1.04	>0.05	25.52±7.8	22.42±8.5	2.27	<0.05
DBS Positive attitudes about smoking score	37.93±6.8	35.80±7.4	1.29	>0.05	34.27±6.9	30.63±7.1	3.12	<0.01
DBS Negative attitudes about smoking score	48.59±7.1	52.00±4.7	1.99	>0.05	43.76±9.7	48.21±7.0	1.45	>0.05

*Parametric test was applied as the scores were distributed normally.

Table 4. Comparison of the Distribution of the HBM and TTM Groups Nurses' Measurements According to Stages of Change

Stages of Change	Pre test	1st Interim test	2nd Interim test	Post test	Friedman X ²	P
HBM	S (%)	S (%)*	S (%)	S (%)		
Precontemplation	11 (%37.9)	9 (%31)	6 (%30)	5 (%25)		
Contemplation	12 (%41.4)	5 (%17.2)	6 (%30)	7 (%35)		
Preparation	5 (%17.2)	6 (%20.7)	8 (%40)	5 (%25)	8.89	<0.05
Action				3 (%15)		
Maintenance	1 (%3.4)					
TTM	S (%)	S (%)**	S (%)***	S (%)		
Precontemplation	25 (%37.3)	9 (%13.4)	10 (%20.8)	8 (%18.6)		
Contemplation	23 (%34.3)	23 (%34.3)	16 (%33.3)	18 (%41.9)		
Preparation	10 (%14.9)	10 (%14.9)	7 (%14.6)	9 (%20.9)	27.00	<0.05
Action	7 (%10.4)	3 (%4.5)	6 (%12.5)	3 (%7)		
Maintenance	2 (%3)	3 (%4.5)	4 (%8.3)	5 (%11.6)		

*9 participants (31%) in this group dropped out of the study. Of these, 5 nurses were at the precontemplation stage, 3 nurses were at the contemplation stage, and 1 of them was at the preparation stage.

**19 participants (28.4%) in this group dropped out of the study. Of these, 8 participants were at the precontemplation stage, 5 participants were at the contemplation stage, 3 participants were at the preparation stage, 2 participants were at the action stage, and 1 participant was at the maintenance stage.

*** 5 participants in this group (10.4%) dropped out of the study. Of these, 3 were at the precontemplation stage and 2 were at the contemplation stage.

Table 5. Comparison of the Scale Mean Scores of the Groups Before and After the Trainings

Scales and Sub-scales	Pre test				Post test			
	HBM X±SD	TTM X±SD	t	P	HBM X±SD	TTM X±SD	t	P
Process of Behavioral Change Scale	69.24±13.1	64.90±14.4	1.4	>0.05	76.30±11.5	77.16±13.2	.2	>0.05
Self-efficacy Scale	22.03±6.7	22.39±7.8	.2	>0.05	25.30±8.2	25.53±8.5	.1	>0.05
Temptation Scale	25.97±6.7	25.52±7.8	.2	>0.05	22.60±8.3	22.42±8.5	.1	>0.05
DBS Positive attitudes about smoking score	37.93±6.8	34.27±6.9	2.4	<0.05	35.80±7.4	30.63±7.1	2.6	<0.05
DBS Negative attitudes about smoking score	48.59±7.1	43.76±9.7	2.4	<0.05	52.00±4.7	48.21±7	2.2	<0.05

Comparison of the groups in terms of the mean scores they obtained from the scale shows that Process of Behavioral Change Scale mean score was high in the HBM group according to the pre-test data. After the trainings provided, both groups demonstrated an increase in the scores, but according to the post-test data, the scores were higher in the TTM group. These differences were not statistically significant. No significant differences were detected between the pre-test and post-test in terms of the mean scores belonging to the Self-efficient Scale and the Temptation Scale.

Decisional Balance Scale mean scores showed that according to the post test measurement conducted after the training, there was a decrease in the positive attitudes about smoking mean scores in both groups. Positive attitudes about smoking mean score in the TTM group was found to be lower than that of the HBM group mean score. The difference was found to be statistically significant ($p<0.05$). After the training, it was found that there was an increase in the negative attitudes about smoking mean scores in both groups. Mean score of the HBM group was found to be higher than that of the TTM group. The difference was found to be statistically significant ($p<0.05$). Negative attitudes about smoking mean scores were found

to be higher than the positive attitudes about smoking mean scores in both groups (Table 5).

Discussion

After the training, the HBM group demonstrated a decrease in the nicotine dependence levels, and positive attitudes about smoking and Temptation Scale mean scores. On the other hand, there was an increase in the Process of Behavioral Change Scale, Self-efficacy Scale and Negative attitudes about smoking mean scores, but it was not statistically significant (Table 3).

Changes in the scale scores indicate that there was an increase in the participants' awareness of negative sides of smoking, they could better handle the factors encouraging smoking, they reached a level in which they could make the decision of cigarette cessation, and they felt stronger about behavioral change.

The training they were provided on the reasons of smoking, the threat in terms of the health situations caused by this behaviour and the related current health problems, positive consequences experienced during the period of cigarette cessation (decrease in the bitter taste in mouth, tasting, using the money they collected for rewarding, etc.), and how to handle obstacles in behavioral changes could be considered to have success by raising their awareness on these issues. According to the Health Belief Model,

realization of an action is associated with the perceived threat in relation to health and the perceived seriousness, perceived benefit in relation to the fulfillment of protective health behaviors, internal and external rewards revealed with the realization of a behaviour, and self-efficacy (University of Twente, 2010; Beydag, & Karaoglan, 2007; Karayurt, Coskun, & Cerit, 2008).

After the training, TTM group demonstrated a decrease in the nicotine dependence level, and Temptation Scale and positive attitudes about smoking mean scores. On the other hand, there was an increase in Process of Behavioral Change Scale, Self-efficacy Scale and negative attitudes about smoking mean scores. Changes in the Process of Behavioral Change Scale, Temptation Scale, Self-efficacy Scale, and positive attitudes about smoking mean scores were found to be statistically significant (Table 3).

Changes in the scale scores indicate that the trainings specific to the stages were effective. The trainings seem to have increased awareness of those who were at the precontemplation stage about the negative effects of smoking; and they seem to have increased awareness of those who were at the contemplation stage about the effects of smoking on the person and the environment as well as the benefits of cigarette cessation. Besides, through the trainings, those who were at the preparation stage reached a level to manage the cigarette cessation process more easily, those at the action and maintenance stages maintained a level to control encouraging factors better, develop alternative behaviors and maintain those behaviors. According to TTM, behavioral change is a process, and interventions performed in accordance with the individual's stage of change make change easier. Otherwise, one develops resistance to behavioral change (Prochaska, & Velicer, 1997). Individuals at different stages have different needs (Turkish Thoracic Society, 2011; Erol, & Erdogan, 2007; Gungormus, 2010).

After the trainings, Gungormus identified an increase in the Process of Behavioral Change Scale and Self-efficacy Scale mean scores and a decrease in the Temptation Scale mean scores, but the difference was not statistically significant (Gungormus, 2010). Koyun found an increase in the Process of Behavioral Change Scale and Self-efficacy Scale mean scores, but the difference was not statistically significant (Koyun, &

Eroglu, 2014). A statistically significant decrease was detected in positive attitudes about smoking mean scores, but no differences were found in the negative attitudes about smoking mean scores. Kristeller et al. reported an increase in the Process of Behavioral Change Scale mean scores (Kristeller, Rossi, Ockene, Goldberg, & Prochaska, 1992). Results of the present study are similar to those found by Gungormus, Koyun and Kristeller et al.

Higher scores in the Process of Behavioral Change Scale indicate higher success chance in relation to the behavioral change; higher Self-efficacy Scale mean scores indicate the strength of taking a stand against the former behaviour; and lower Temptation Scale score indicates the low probability of restarting the former behavior (Erol, & Erdogan, 2007; Erol, & Erdogan, 2008; Gungormus, 2010). Higher scores in relation to the negative sides of smoking obtained from the questions in the Decisional Balance Scale indicate higher chance of determination and maintenance for changing a behavior (Erol, & Erdogan, 2007; Gungormus, 2010; Karadagli, & Nahcivan, 2012; Velicer, DiClemente, Prochaska, & Brandenburg, 1985; Yalcikaya-Alkar, & Karanci, 2007).

The decrease in the scores of the Nicotine Dependence test, which demonstrated physical dependence on nicotine, can be associated with the increase in the prospective movement in the change stages which are accepted as a change in favor of the cigarette cessation.

An analysis of the stages of change shows that 17.2% and 3.4% of the nurses in the HBM group were in the preparation and maintenance stages respectively. According to the post test values obtained after the trainings, 25% were at the preparation stage and 15% were at the action stage (Table 4). As for the TTM group, 14.9% were at the preparation stage, 10.4% were at the action stage, and 3% were at the maintenance stage. After the trainings, the post test data indicated that 20.9% were at the preparation stage, 7% were at the action stage, 11.6% were at the maintenance stage (Table 4). These improvements in the stages of change after the trainings were found to be statistically significant in both groups (Table 4). These results indicate that the trainings supported the prospective action between the stages and affected the cigarette cessation behaviour positively. Unlike the HBM group, those in the TTM group were found to

give up smoking for more than six months after the trainings. Gungormus investigated the effects of the TTM based training on the cigarette cessation of high school students; the progression between the stages of change was found to be statistically significant, 37% of the students were found to give up smoking (Gungormus, 2010). Prochaska et al. considered the transition to the action stage after the training as an achievement (Prochaska, & DiClemente, 1983). Koyun investigated the effect of the TTM based training given to adult women on cigarette cessation and found the progression in the stages of change statistically significant; 13.2% of the women were found to have given up smoking for six months (Koyun, & Eroglu, 2014).

Those who Restart Smoking

Two participants in this study, one in the HBM and the other in the TTM group, who were at the action stage and restarted smoking, regressed to the contemplation stage. This negative result was caused by the excessive stress experienced by the person in the HBM group and the weight gained by the person in the TTM group. These two participants who regressed to the contemplation stage demonstrated a decrease in the Self-efficacy Scale scores and an increase in the Temptation Scale scores, which demonstrates that strength for living without smoking decreased due to the intensive pressure of the encouraging factors (stress and weight control), and thus they restarted the smoking behaviour.

Conclusion and Recommendations

HBM and TTM based trainings were found to have positive effects both on progression between the stages and smoking cessation for 6 months and longer periods of time. Studies with larger groups of participants for HBM and TTM based training programs for smoking cessation should be conducted with nurses, who are perceived as role models by society. Effectiveness of these models should be demonstrated through similar studies conducted with different groups as well. Practices recommended include providing trainings based on these models as courses in nursing schools and as compulsory in-service trainings in health institutions, evaluating nurses' smoking habits while employing them and preventing smoking nurses from working in the same unit, and supporting practices that prevent smoking and encourage smoking cessation.

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References

- Aslan, D., Bilir, N., & Ozcebe, H. (2008). Smoking frequency among health professionals. *Joined work of the CDC, WHO, Ministry of Health Turkey and Society of Public Health Specialists*, Turkey.
- Aylaz, R. Hacievliyagil, S., & Durdu, A. (2008). Smoking behaviors and affecting factors of nurses working at Turgut Özal Medical Center. *Journal Of Dependence*, 9(1),3-8.
- Beydag, KD., & Karaoglan, H. (2007). Effect Of Breast Self Examination Education to the Knowledge and Attitudes of Female Students. *TAF Preventive Medicine Bulletin*, 6(2), 106-111.
- Durmus, B., & Pirincci, E. (2009). Relationship between smoking status and anger the university of students. *Journal of Inonu University Medical Faculty*, 16(2), 83-88.
- Erbaycu, AE., Aksel, N., Cakan, A., & Ozsoz, A. (2004). Smoking habits of health workers in Izmir province. *Turkish Thoracic Journal*, 5(1), 6-12.
- Erol, S., & Erdogan, S. (2007). Application of Transtheoretic Model for improving and changing health behaviours. *Journal of Anatolia Nursing and Health Sciences*, 10(2), 86-94.
- Erol, S., & Erdogan, S. (2008). Application of a stage based motivational interviewing approach to adolescent smoking cessation: The Transtheoretical Model-based study. *Patient Education and Counseling*, 72(1), 42-48.
- Fagerstrom, KO., & Schneider, NG. (1989). Measuring nicotine dependence: a review of the fagerstrom tolerance questionnaire. *Journal of Behavioral Medicine*, 12(2), 159-182.
- Gozum, S., & Capik C. (2014). A Guide in the development of health behaviours: Health Belief Model (HBM) *Dokuz Eylul University Faculty of Nursing Electronic Journal*, 7(3), 230-237.
- Gungormus, Z. (2010). Evaluation of smoking behavior in high school students using the Transtheoretic Model. *Continuous Medical Education Journal*, 19(1), 12-18.
- Karadagli, F., & Nahcivan, N. (2012). Factors associated with readiness to quit smoking among smokers. *Dokuz Eylul University Faculty of Nursing Electronic Journal*, 5(1), 8-15.
- Karayurt, O., Coskun, A., & Cerit, K. (2008). Nurses' beliefs about breast cancer and breast self examination and their breast self examination

- performance. *The Journal of Breast Health*, 4(1), 15-20.
- Koyun, A., & Eroglu, K. (2014). The transtheoretical model use for smoking cessation. *International Association of Social Science Research-IASSR, special publication*, 130-134.
- Kristeller, JL., Rossi, JS., Ockene, JK., Goldberg, R., & Prochaska, JO. (1992). Processes of change in smoking cessation: a cross-validation study in cardiac patients. *Journal of Substance Abuse*, 4(3), 263-276.
- Kutlu, R., Marakoglu, K., & Civi, S. (2005). The frequency and affecting factors of smoking among nurses of Medicine Faculty of Meram, University of Selcuk. *Journal of the Faculty of Medicine Cumhuriyet University*, 27(1), 29-34.
- Okutan, O., Tas, D., Kaya, H., & Kartaloglu, Z. (2007). Affecting factors of nicotine dependence in the smoker health workers. *Tuberculosis and Thorax*, 55(4), 356-363.
- Onsuz, MF., Topuzoglu, A., Algan, A., Soydemir, E., & Aslan, I. (2009). Evaluation of the relationship between perception of tobacco packaging warning messages and the nicotine addiction levels of smokers. *Marmara Medical Journal*, 22(2), 111-122.
- Ozturk, O. (2009). Health professions and cigarette. *Medical Journal of Suleyman Demirel University Tip Fakultu Journal*, 16(4), 32-38.24.
- Pallonen, UE., Prochaska, JO., Velicer, WF., Prokhorov, AV., & Smith, NF. (1998). Stages of acquisition and cessation for adolescent smoking: an empirical integration. *Addictive Behaviors*, 23(3), 303-324.
- Prochaska, JO., & DiClemente, CC. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting Clinical Psychology*, 51(3), 390-395.
- Prochaska, JO., Velicer, WF., DiClemente, CC., & Fava, J. (1988). Measuring processes of change: applications to the cessation of smoking. *Journal of Consulting and Clinical Psychology*, 56(4), 520-528.
- Prochaska, JO., & Velicer, WF. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion*, 12(1), 38-48.
- Republic of Turkey Ministry for EU Affairs (2011). At a Glance Health-Europe 2010. Retrieved from https://www.ab.gov.tr/files/tprb/bir_bakis_saglik.pdf
- Republic of Turkey Ministry of Health (2008). *National Tobacco Control Program and Action Plan. 2008-2012*.
- Talay, F., Altin, S., & Cetinkaya, E. (2007). The smoking habits of health care workers and their approach to smoking in Gaziosmanpasa and Eyup counties of İstanbul. *Tuberculosis and Thorax*, 55(1), 43-50.
- Temel, O., Coskun, AS., Gok, S., Celik, P., & Yorgancioglu, A. (2009). The effect of nicotine among active, passive smoker health personnel *Turkish Thoracic Journal* , 10(3), 107-111.
- The Organisation for Economic Co-operation and Development (OECD) (2014). Health Statistics 2014. Retrieved from <http://www.oecd.org/els/health-systems/Briefing-Note-TURKEY-2014.pdf>.
- Turkish Statistical Institute (2008). Global Adult Tobacco Survey. Retrieved from <file:///C:/Users/Universite/Downloads/4928448247169330305.pdf>.
- Turkish Statistical Institute (2012). Global Adult Tobacco Survey. Retrieved from http://www.halksagligiens.hacettepe.edu.tr/KYTA_TR.pdf.
- Turkish Thoracic Society (2011). Smoking Cessation Process. Retrieved from http://www.toraks.org.tr/10_kongre_kurs/pdf/483_490_Sigarayi_Birakma_Sureci.pdf.
- University of Twente (2010). Health Belief Model. Retrieved from https://www.utwente.nl/en/bms/communication-theories/sorted-by-cluster/Health%20Communication/Health_Belief_Model/
- U.S. Department Of Health And Human Services (2014). A Report of the Surgeon General The Health Consequences of Smoking-50 Years of Progress. Retrieved from <http://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf>.
- Uysal, MA., Kadakal, F., Karsıdag, C., Bayram, NG., Uysal, O., & Yilmaz, V. (2004). Fagerstrom test for nicotine dependence: reliability in a Turkish sample and factor analysis. *Tuberculosis and Thorax*, 52(2), 115-121.
- Velicer, WF., DiClemente, CC., Prochaska, JO., & Brandenburg, N. (1985). Decisional balance measure for assessing and predicting smoking status. *Journal of Personality and Social Psychology*, 48(5), 1279-1289.
- Velicer, WF., DiClemente, CC., Rossi, SJ., & Prochaska, JO. (1990). Relapse situations and self-efficacy: an integrative model. *Addictive Behaviors*, 15(3), 271-283.
- WHO (2009). Report On The Global Tobacco Epidemic. Retrieved from <http://www.who.int/tobacco/mpower/2009/en/>
- WHO (2010). MPOWER. Retrieved from <http://www.who.int/tobacco/mpower/en/>
- WHO (2015). Tobacco. Retrieved from <http://www.who.int/mediacentre/factsheets/fs339/en/>