Efficacy of Trans Theoretical Model Intervention for Improving Behaviors related to Electronic Hookah Smoking among Healthcare Workers in Mosul Hospital: A Randomized Control Trail

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Abstracts: The most common preventable cause of mortality and sickness in the world is tobacco usage, due to an improved understanding of the health dangers associated with smoking, indoor smoking prohibitions, restrictions on media and advertising and increasing public awareness, the rate of cigarette smoking has dropped in the United States over the past 45 years, However, these effective initiatives are threatened by the increased usage of other tobacco products like hookah.To determine the efficacy of trans theoretical model intervention for improving behaviors related to electronic Hookah smoking among healthcare workers in Mosul hospital. A simple random sample with probability of 56 males and 2 females health care workers (HCW) for the two group with different position. The sample was collected for the study group in Mosul General hospital that they were 58 HCW who they are electronic hookah smokers/ 29 HCW who agree to participate in the study and the others has refused participation. the data are being collected in the beginning of October 2022. through the use of the study instrument and finishing in May 2023. Data is analyzed using the "Statistical Package for Social Science (SPSS) software for Windows (Version 26)".This finding the explain the mean difference for pre-test, post-test 1 and post-test 2 that there is marked change in mean about (0.6 to1.10) in study group while there is no noticeable change in mean in control group.This study concluded that the health intervention for behavior change through Transtheoretical Model demonstrates the importance of Electronic hookah smoking cessation and has a positive impact on health care workers perceptions of Stage of change, process of change, decisional-balance and self-efficacy/temptation.

Keywords: Efficacy, Trans Theoretical Model, Electronic Hookah, Smoking, Healthcare Workers.

1. INTRODUCTION

Globally, tobacco use is considered the second leading cause of death and it is responsible for the deaths of 1 in 10 adults, another way to smoke tobacco is with a hookah and Electronic Hookah, which also includes smoking shisha, bubble-bubble, nargileh, and water pipes (WP), despite the fact that hookah smoking has been around for at least 400 years, it is now widely used from the Eastern Mediterranean region to Western countries and a single 45-minute session can expose the smoker to 48.6 times as much smoke as smoking a cigarette[1].Between 2017 and 2018 among university students in five European countries: Belarus, Lithuania, Poland, Russia, and Slovakia with an overall response rate of 72.2 percent, we looked at the prevalence of cigarette smoking and e-cigarette use among students from Central and Eastern Europe and investigated personal characteristics associated with cigarette and e-cigarette smoking. 43.7 percent of the respondents had used an e-cigarette, whereas 23.3 percent had smoked regular tobacco cigarettes, 12.3% of those who were currently smoking used traditional cigarettes, 1.1 percent used e-cigarettes, and 1.8 percent used both [2].Both the electronic nicotine delivery system (ENDS) and hookah are popular smoking methods particularly among young people, the public has false perceptions about the relative safety of ENDS and hookah, so that ENDS smokers think that smoking ENDS exposes them to less or no nicotine content while hookah smokers typically think that smoking hookah is safe because water in the hookah apparatus filters out the nicotine content [3].The Transtheoretical model of behavior change is an integrative treatment theory that determines whether a person is ready to adopt a new healthier behavior and offers methods or techniques to help the person do so, the model includes concepts like decisional balance, self-efficacy and phases and processes of transformation, "stages of change" is another name for the transtheoretical model[4].The Transtheoretical Model is a theoretically-based method for conceptualizing behavioral change that includes the selection and application of appropriate interventions to help clients improve their health-related habits according to the Transtheoretical Model, behavioral change happens over the course of five stages (precontemplation, contemplation, preparation, action, and maintenance) with each stage's progression depending on the decisional

balance of the previous one (the pros and cons that influence the decision) [5].The TTM aims to incorporate and integrate key constructs from other theories into a comprehensive theory of change that can be applied to a variety of behaviors, populations, and settings, in contrast to other models of behavioral change that exclusively focus on certain dimensions of change (for example, theories focusing mainly on social or biological influences) (e.g. treatment settings, prevention and policy-making settings, etc.), addiction and Change: How Addictions Develop and Addicted People Recover, written by Dr. DiClemente, provides more information on the model's creation and how to apply it effectively in both clinical and research settings [6].According to a recent CDC report, many adults are using e-cigarettes to try to give up smoking, however, the majority of adult e-cigarette users continue to use both products, or "dual use" and do not give up smoking cigarettes using tobacco products in addition to normal cigarettes, such as smokeless tobacco, e-cigarettes, or other tobacco products, is not an effective approach to protect your health, since even a few cigarettes a day can be harmful, stopping smoking for good is crucial to save your health [7].One of the main causes of adolescents' propensity for hookah smoking is a positive attitude toward it, as well as false beliefs about its health risks compared to cigarette smoking, false beliefs that it is not addictive, cultural and social acceptability, and ease of accessibility, as there are more hookah cafés, pubs, and restaurants, the consumption of hookah is anticipated to expand [8].The popularity of electronic hookahs among Iraqi youth in recent years necessitates an evaluation of these items' effects on oxidative stress in liver tissue, the objective of the current study is to analyze the oxidative stress brought on by electronic hookah fumes on mouse liver tissues(9).The aim of the study to determine the efficacy of trans theoretical model intervention for improving behaviors related to electronic Hookah smoking among healthcare workers in Mosul hospital.

2. MATERIEL AND METHODS

2.1. Study Design

True experimental design through using randomized controlled trial is conducted to determine Transtheoretical Model Intervention in improving behaviors related to Electronic Hookah among Healthcare workers.

2.2. Study Setting

The study was carried out in Al-Mosul city, the capital of the Nineveh Governorate, which is located in northern Iraq. Al-Mosul is the second-largest city in Iraq, located approximately (404) kilometers north of Baghdad. Especially in Mosul General Hospital is located West of the Tigris River from the city of Mosul (for study group) and Al-shifa hospital that is located East of the Tigris River from Mosul city (for control group).

2.3. Study Sample

A simple random sample with probability of 56 males and 2 females health care workers(HCW) for the two group with different position . The sample was collected for the study group in Mosul General hospital that they were 58 HCW who they are electronic hookah smokers/ 29 HCW who agree to participate in the study and the others has refused participation, and in the control group in Al-Shifa hospital there 39 HCW who are electronic hookah smokers /29 HCW who agree to participate in the study, the experimental and control groups were formed using random assignment and selection.

2.4. Study Instrument

The information used in this study was acquired by a questionnaire that have two sections: section I, which describes the employee's socio-demographic characteristics features as (age, gender, marital status, hosing status) and the section II, includes measuring with a scale improving behavior related to electronic hookah based on transtheoretical model for health care workers in Mosul city.

2.5. Data Collection

First, the data are being collected in the beginning of October 2022. through the use of the study instrument and finishing in May 2023. Each person needs about 30 to 40 minutes to complete the questionnaire.

2.6. Statistical Analysis

Data is analyzed using the "Statistical Package for Social Science (SPSS) software for Windows (Version 26)". Two different approaches are employed for the data analysis which includes: Descriptive Statistical Data Analysis Approach, fisher's exact Test for Equality of Variances and paired T test to make comparisons between two related samples[10-20].

2.7. Ethics Committee Approval

This study (Study code 231/654) received approval from the Ministry of Health's recently formed Ethics Committee. Individual informed consent was not needed, the review panel determined.

3. RESULTS AND DISCUSSIONS

Table 1: Demographical characteristics and Homogeneity between Experimental and Control group

Socio-demographic	Experimental group (N=29)		Control group (N= 29)		Fisher's Exact test P-value
	F	%	F	%	
Age					
21-25	3	10.3	1	3.4	0.611
26-30	13	44.8	8	27.6	0.274
31-35	9	31.0	12	41.4	0.585
36-40	3	10.3	5	17.2	0.706
41 or more	1	3.4	3	10.3	0.611
Gender					
Male	27	93.1	29	100	0.491
Female	2	6.9	0	0	0.491
Marital status					
Single	7	24.1	6	20.7	1.000
Married	22	75.9	23	79.3	1.000
Divorced	0	0	0	0	1.000
Widower	0	0	0	0	1.000
Residential					
House owner	23	79.3	25	86.2	0.730
House rent	6	20.7	4	13.8	0.730

Table (1) shows that the study participants characteristics were 58 healthcare workers, although was classified into five group and the most frequent percent for study group was 44.8% (13) in group 26-30years, while 41.4% (12) in group 31-35 for control group. For gender there was 56 male and 2 female HCWs in both group (27 male /2 female in study and 29 males in control group), Concerning marital status most of the participants were married in both group while there is no one divorced of widow in two group, regarding residential status for participant was most of them were house owner in study (79.3) and control (86.2) group.There was no statistically difference according to Fisher's Exact test between group in age, gender, marital status and residential status and all the samples are belong to the same population and we accept the null hypothesis.

Table 2: Frequency and percentage for stage of change for Experimental and control group

Groups	Stages of change	Pre-test		Post-test		Post2-test	
		F	%	F	%	F	%
Experimental group	Precontemplation	17	58.6	6	20.7	7	24.1
	Contemplation	12	41.4	23	79.3	22	75.9

	Preparation	9	75.0	19	82.6	21	91.3
	Action but relapse	19	65.5				
Control group	Precontemplation	14	48.3	15	51.7	16	55.2
	Contemplation	15	51.7	14	48.3	13	44.8
	Preparation	10	66.7	9	64.3	10	71.4
	Action but relapse	18	62.1				

This table show the different stage of change that participant pass through it in Pre, post1and post2 test.in pre-test for study group there was 58.6% (17) precontemplation stage, 41.4% (12) in contemplation stage and 75% (9) from them was in preparation stage and there is 65.5% (19) from the total study sample have tried to leaves electronic hookah during the past 6 months but they failed. In post-test1 there were 20.7(6) in precontemplation and 79.3% (23) in contemplation stage with 82.6% (19) from them was in preparation stage. In post-test 2 there were 24.1% (7) in precontemplation stage and 75.9% (22) was in contemplation with 91.3% (21) from them was in preparation stage.While for control group in pre-test there was 48.3% (14) precontemplation stage, 51.7% (15) in contemplation stage and 66.7% (10) from them was in preparation stage and there is 62.1% (18) from the total control sample have tried to leaves electronic hookah during the past 6 months but they failed. In post-test1 there were 51.7(15) in precontemplation and 48.3% (14) in contemplation stage with 64.3% (9) from them was in preparation stage. In post-test 2 there were 55.2% (16) in precontemplation stage and 44.8% (13) was in contemplation with 71.4% (10) from them was in preparation stage.

Table 3: Mean differences for process of change, decisional balance and self-efficacy in pre, post1 and post 2 in both group

	Experimental			**Control**		
	Pretest	**Post1**	**Post2**	**Pretest**	**Post1**	**Post2**
Behavioral process of change	2.871264	3.614943	3.67931	2.805747	2.817241	2.898851
Experiential process of change	2.888506	3.683333	3.72931	2.924713	3.03046	3.172414
Decisional balance	2.527094	3.044335	3.14039	2.581281	2.785714	3.019704
Self-efficacy/temptation	2.82266	3.564039	3.62807	2.832512	2.903941	3.086207

This table explain the mean difference for pre-test, post-test 1 and post-test 2 that there is marked change in mean about (0.6 to1.10) in study group while there is no noticeable change in mean in control group.

Table 4: Mean, Std. and p-value for process of change in study and control group

Process of change		Mean	Std.	P-value
Study Group	Pre	2.8713	.48673	.000
	Post 1	3.6293	.53467	
	Pre	2.8713	.48673	.000
	Post 2	3.7043	.43995	
	Post 1	3.6293	.53467	.557
	Post 2	3.7043	.43995	
Control Group	Pre	2.8652	.64897	.649
	Post 1	2.9066	.49718	

	Pre	2.8652	.64897	.072
	Post 2	3.0356	.51496	
	Post 1	2.9066	.49718	.121
	Post 2	3.0356	.51496	

This table show the relationship for third axis (process of change) between pre, post1, post2 Mean, Standard deviation and P-value that has been measured by paired T test for study and control group. For the study there is statistically significance at confidence interval 95% between pre and post-tes1, pre and post-test 2 because P-value .000 < .05, but between post1and post-test2 there wasn't statistically significance because P-value .557 > .05. While for control group there wasn't statistically significant between pre, post1, post-test 2 because P-value is 0.649, 072, 0.121 > .05.

4. DISCUSSION THE BASELINE DEMOGRAPHIC CHARACTERISTIC AND HOMOGENEITY BETWEEN EXPERIMENTAL AND CONTROL GROUPS STUDY FOR THE PARTICIPANTS

The number of participants in this study is 58 healthcare workers from the Mosul hospitals, whose ages range from 21 to 40 years or more, 29 participants in study groups and 29 in control groups. The table (1) depicts the descriptive analysis of the sample, the (p-value) according to fisher exact test for age, gender, marital status and residential unit that there are no significant variances p-value is more than 0.05 and that the samples are homogeneous. The results of Table 1 show that the experimental group's most frequent age range was between 26 and 30 years, while the control group's most frequent age range was between 31 and 35 years. This explains why the participant's most frequent age range was between 26 and 35 years and the samples are homogenous between study and control group that has been analyzed according to fisher exact test for each age groups in both groups and p-value was more than 0.05 and this conclusion is supported by [21].According to the study's findings that say the smokers were most frequently between the ages of 20 and 35 years.Concerning gender characteristics for study group, the majority of participants were male (93.1%) and female was (6.9%) and gender distribution for male and female between groups was homogenous and p-value was more than 0.05 and this result is agreed with [22].) that explore the male smoker was (92.8%) and female was (7.2%). While for control group all of the participant were male and there is no female who participate in the study.Regarding other demographic marital status, most of participants were married (77.6%), single (22.4 %) and there is no one from the participant was divorced or widow in the total participants, while regarding residential status for HCWs there is house owner (82.8%), house rent (17.2%) for all the health care workers in the study.

4.1. Discussion the change in stages of change in study group as a result of intervention:

Concerning table (3) that show most of participant in study group before intervention are in precontemplation stages (58.4%) and the other percent were in contemplation stages (41.6%), (75%) from the contemplation was in preparation stage. there is (65.5%) from the participant in study group who had made an action but they failed and they relapse and this result agreed with (12) study result. while in post-test1 there is decrease in precontemplation (20.7%) and increase in contemplation stage (79.3%) and about (82.6%) move to preparation stage and this can be approved by[23-30]., while for action stage couldn't be measured in post-test1,2 because action should be continue for 6 months to be considered action stage. While for control group there wasn't much difference between stages before and after intervention and this agreed with [31].While for the control group almost equally distribution of the participants between the stages, there is about (48.3%) in precontemplation stage and about (51.7%) in contemplation stage and about (66.7%) from the contemplators who were in preparation stage, and there is about (62.1%) from all the participant who had made a trial in leaving electronic hookah for at least 24 hours in the previous 6 months and this all in the pre-test phase. for the post-test1 there is about (51.7%) from the participants in precontemplation stage and about (48.3%) in contemplation stage and about (64.3%) from the contemplators are in preparation stage. While in post-test2 there is about (55.2%) from the health care workers in precontemplation stage and about (44.8%) in contemplation stage and about (71.4%) from the contemplators are in preparation stage in the control group and we observe that there is no noticeable improve in the stages of change for the health care workers because they left without any intervention[32-36].

4.2. Discussion the change in process of change, decisional-balance, self-efficacy in study group as a result of intervention

Table 3 explain the summary for changing in mean for process of change (behavioral, experiential), and decisional-balance and self-efficacy/temptation before intervention (pre-test) and after intervention (post-test1,2) in study group and all of the change are in the positive way and this agreed with[37]that show the significant change except for cons of smoking"($P > 0.05$), all TTM constructs had significantly changed; temptation ($F = 36.864$, $P < 0.001$), pros ($F = 12.172$, $P < 0.001$), experiential processes ($F = 3.377$, $P < 0.001$), and behavioral processes ($F = 11.131$, $P < 0.001$).and other study (Huang et al., 2013) Determinants of change, post-test scores of knowledge, experiential and behavioral processes and self-efficacy were significantly different between the intervention group and comparison group, the intervention group had significantly higher post-test scores than the comparison group. About table 4 that show the significant change as a result of intervention in the intervention group between pre-test, post-test1,2 and there no significant change between post-test1 and post-test2 because change already has been done previously rather than no significant change in control group in all steps pre, post1, post2 and this agreed with study[38].The nurses' interventions in the smoking cessation program were successful, leading to a favorable shift in attitude and behavior that would support the students' decision to stop smoking and the cessation process".

CONCLUSION

This study concluded that the health intervention for behavior change through Transtheoretical Model demonstrates the importance of electronic hookah smoking cessation and has a positive impact on health care workers perceptions of Stage of change, process of change, decisional-balance and self-efficacy/temptation and the intervention efficaciously moved electronic hookah smokers from lower Stages of Change to higher Stages. The manipulation efficaciously made healthcare workers more aware Processes of Change of hookah smoking, enhanced their Self-Efficacy/Temptation of hookah smoking, and Decisional Balance of hookah smoking.

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