MOSUL JOURNAL OF NURSING
Online ISSN: 2663-0311 - Print ISSN: 2311-8784
Website: https://mjn.mosuljournals.com

RESEARCH ARTICLE

Stages of Change for Hookah Smoking among High School Male Students

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ABSTRACT

Background: *Tobacco use is a significant and controllable risk factor for the spread of diseases, as well as a rise in morbidity and mortality, which leads to early death. Because of its popularity, the use of this substance is on the rise among children and adolescents.*

Aim: *The aim of this study is to understand stages of change for hookah smoking among high school male students.*

Methodology: *Part of the study was an experimental randomized controlled trial used to guide this study. The study was carried out at Tuz High School for males in Tuz Khurmatu District, Salah-Aldeen Governorate. The study included a simple random sample of 144 high school students. The study instrument includes students' sociodemographic data. It also includes the Stages of Change Scale for Hookah Smoking, The Processes of Change Scale for Hookah Smoking, The Self-Efficacy/ Temptation Scale for Hookah Smoking, and The Decisional Balance Scale for Hookah Smoking. Data were collected using a self-reported method for the period from November 1st, 2021 to March 31th, 2022. Data were analyzed using the statistical package for social science (SPSS) for Windows, version 26.*

Results: *There are significant differences in the values of the Processes of Change of hookah smoking over time for participants both in the study and control groups ($F = 90.973$, $df = 2$, $p < .01$ vs. $F = 32.346$, $df = 2$, $p < .01$).*

Conclusion: *The lower the Stage of Change, the poorer the Self-Efficacy for hookah smoking cessation. In posttest II, the lower the Stage of Change, the more the used Processes of Change for hookah smoking cessation. The higher the Stages of Change, the greater the Self-Efficacy and Decisional Balance for hookah smoking cessation.*

Keywords: Hookah Smoking, High School Male Students

Received: 23 March 2022, Accepted: 18 June 2022, Available online: 28 August 2022

INTRODUCTION

Because of its link to multiple life-threatening conditions, smoking is a major public health issue and one of the leading causes of mortality and morbidity (Shankar et al., 2008). Public health activists and politicians are currently confronted with a tremendous dilemma, as there are no clear guidelines on how to develop successful education and intervention methods to reduce consumption. The WHO's national tobacco control legislation to combat the tobacco pandemic has yet to be adopted in the majority of countries (Warren et al., 2009).

Furthermore, rather than cessation methods, most tobacco control programs contain preventive measures (Grimshaw & Stanton, 2006). According to the literature review, only a few studies have provided successful educational strategies for hookah smoking cessation, and no research on the effectiveness of a theory-based education intervention on hookah smoking cessation in students has been conducted (Joveini et al., 2020).

Hookah use was reported by 22.5 % of high school students in Florida in 2014, up from 18.2 % in 2011. Furthermore, 11.6 % noted they were now using a hookah, up from roughly 8% in 2011. (Barnett et al., 2017). According to Fielder et al., in 2009-2010, the prevalence of hookah usage among students grew from 29 to 45 % (from pre-university to university) (Fielder et al., 2013). Many studies have demonstrated that smoking hookah have much greater dangerous effects than smoking cigarettes.

Tobacco use is a significant and controllable risk factor for the spread of diseases, as well as a rise in morbidity and mortality, which leads to early death [Samet and Yoon (2010)]. Because of its popularity, the use of this substance is on the rise among children and adolescents (Kelishadi et al., 2016). The prevalence of hookah usage among Iranian adolescents is 23.1 %, according to the findings of a meta-analysis (Ansari-Moghaddam et al., 2016). Another survey of Iranian teenagers aged 14-18-years-old exhibited that to be 10.4% of them smoke hookah.

METHOD

Part of the study was an experimental randomized controlled trial used to guide this study. Experimental designs are the definitive way to establish evidence of causation. The reason researchers prefer these designs is that they assure a high degree of internal validity, because random assignment creates experimental and control groups that are very similar. It is noted to be the strongest methodology for testing the effectiveness of a treatment because of the elements of the design that limit the potential for bias.

The study was carried out at Tuz High School for males in Tuz County, Salah Al-deen Governorate. The study included a simple random sample of high school male students who agreed to participate in this study. The study subjects were recruited from three grades in this school which are Fourth Grade, Fifth Grade, and Sixth Grade. Subjects were randomly assigned into both study and control groups; 72 students for the study group and 72 students for the control group. The simple random sampling involved having the lists of students' names in Tuz High School for males generated on Microsoft Office Word software. The names of students in each grade were cut in identical pieces of paper, in the same color of paper, and folded in the same way.

The sample size was determined using G*Power software based on an effect size of 0.25, alpha error probability of 0.05, a power of 0.95, two groups, three repetitions. Thus, the recommended sample size would be 142. The final sample size is 144.

After receiving the approval of the College of Nursing, University of Baghdad for the study, the student researcher discussed study details with officials at the selected high school. The general purpose of the study was explained to the participants, as well as how to complete the questionnaire, to ensure that they understand that participation is optional and that they can withdraw at any time. The student researcher assured participants that the confidentiality of their data will be safeguarded and securely maintained during and following study participation. The student researcher further assured study participants that their identities will remain anonymous in the presentation, reporting, and/or any eventual publication of the study.

Data were analyzed using the statistical package for social science (SPSS) for windows, version 26. The statistical measures of frequency, %, mean, standard deviation, Repeated Measures ANCOVA, linear regression, One-way analysis of variance (ANOVA), and independent-sample t-test will be used.

RESULTS

Table 1

Mauchly's Test of Sphericity for the Processes of Change of hookah smoking

Mauchly's Test of Sphericity[a]							
Measure: MEASURE_1							
Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Processes of Change	.910	6.568	2	0.037	0.918	0.941	0.500

Table 2

Multivariate Tests of the Within-subjects for the Processes of Change of hookah smoking

Multivariate Tests[a]							
Effect		**Value**	**F**	**Hypothesis df**	**Error df**	**Sig.**	**Partial Eta Squared**
POC (Study)	Pillai's Trace	0.635	60.973[b]	2.000	70.000	.000	0.635
	Wilks' Lambda	0.365	60.973[b]	2.000	70.000	.000	0.635
	Hotelling's Trace	1.742	60.973[b]	2.000	70.000	.000	0.635
	Roy's Largest Root	1.742	60.973[b]	2.000	70.000	.000	0.635
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
POC (Control)	Pillai's Trace	0.480	32.346[b]	2.000	70.000	.000	0.480
	Wilks' Lambda	0.520	32.346[b]	2.000	70.000	.000	0.480
	Hotelling's Trace	0.924	32.346[b]	2.000	70.000	.000	0.480
	Roy's Largest Root	0.924	32.346[b]	2.000	70.000	.000	0.480

Table 3

Tests of Within-Subjects Effects for the Processes of Change of hookah smoking

Source		**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**	**Partial Eta Squared**
Processes of Change (Study)	Sphericity Assumed	40045.676	2	20022.838	44.054	.000	.383
	Greenhouse-Geisser	40045.676	1.836	21815.994	44.054	.000	.383
	Huynh-Feldt	40045.676	1.882	21278.810	44.054	.000	.383
	Lower-bound	40045.676	1.000	40045.676	44.054	.000	.383
Error (Processes of Change Study)	Sphericity Assumed	64539.657	142	454.505			
	Greenhouse-Geisser	64539.657	130.328	495.208			
	Huynh-Feldt	64539.657	133.619	483.014			
	Lower-bound	64539.657	71.000	909.009			
Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Processes of Change (Control)	Sphericity Assumed	20435.361	2	10217.681	20.181	.000	.221
	Greenhouse-Geisser	20435.361	1.717	11903.416	20.181	.000	.221
	Huynh-Feldt	20435.361	1.755	11642.648	20.181	.000	.221
	Lower-bound	20435.361	1.000	20435.361	20.181	.000	.221
Error (Processes of Change	Sphericity Assumed	71893.972	142	506.296			

Control)	Greenhouse-Geisser	71893.972	121.890	589.825			
	Huynh-Feldt	71893.972	124.620	576.904			
	Lower-bound	71893.972	71.000	1012.591			

DISCUSSION

Regarding the Processes of Change of hookah smoking, their values for participants in the study group noticeably increase by time with significant differences in their values over time. The omnibus effect (measure of association) for this analysis is 38.3, which indicates that approximately 38% of the total variance in the Processes of Change of hookah smoking values is accounted for by the variance in the administered intervention. The pairwise comparison displayed a consistent variation in the values of the Processes of Change over time. These findings reflect the efficacy and consistency of the TTM-based intervention in rendering participants employing the Processes of Change in moving across the Stages of Change. These findings are supported by Aghdam et al., (2021) who reported that using social media to send messages to people with positive reward material can help people quit smoking hookah or reduce their use.

The values of the Self-Efficacy/Temptation of hookah smoking for the study group noticeably increase over time compared to the control group with a significant difference in the values of the Self-Efficacy/Temptation of hookah smoking with an omnibus effect (measure of association) for this analysis was 28.2 which indicates that approximately 28% of the total variance in the Self-Efficacy of hookah smoking values is accounted for by the variance in the administered intervention. The pairwise comparison displayed an invariant consistent variation in the values of the Self-Efficacy for hookah smoking cessation. These findings reflect the efficacy of the TTM-based intervention in enhancing participants' Self-Efficacy of hookah smoking cessation. These findings are supported by Schorr et al., (2009) who reported that the subjects' smoking cessation Self-Efficacy is quite poor.

Durkin et al., (2021) who revealed there was a substantial direct relationship between Self-Efficacy and ever e-cigarette usage, with individuals with poorer efficacy having a higher likelihood of having used e-cigarettes at some point in their lives.

Ayar et al., (2019) concluded that there is a negative link between adolescents' views of the Self-Efficacy of smoking and their actual smoking behaviors. John et al., (2003) concluded that Only one of the six Fagerstrom Test for Nicotine Dependence (FTND) items, the time to first cigarette after awakening, revealed different rates by the Stages, with more smokers in the Contemplation or Preparation Stage of those who smoked their first cigarette afterward than one hour after awakening. Tagai et al., (2020) who reported temptation was the only C-SHIP (Cognitive Social Health Information Processing Model) variable that differed significantly between relapsers and non-relapsers. The overall and subscales of temptation in non-relapsers (i.e., negative affect, social/positive temptation, habitual/craving temptation) both decreased considerably with time. Relapsers had a transient drop in overall temptation from baseline to one month. This did not, however, last three months. Furthermore, both relapsers and non-relapsers observed a decrease in upsetting events with time, and non-relapsers saw a rise in the benefits of stopping vs. the difficulties of quitting. In neither group, there were significant gains in knowledge or techniques for quitting.

The values of the Decisional Balance of hookah smoking for the study group noticeably increase by time with a significant difference in the values of the Decisional Balance of hookah smoking over time. The omnibus effect (measure of association) for this analysis is 31.5, which indicates that approximately 31% of the total variance in the Decisional Balance of hookah smoking values is accounted for by the variance in the administered intervention. The pairwise comparison revealed an invariant consistent variance in the Decisional Balance of hookah smoking over time. These findings are supported by Schorr et al., (2009) who reported Low levels on the two Decisional Balance scales imply that people who smoke in the disengage pessimistic class shall not participate themselves much in the Cons and Pros of a habit change. Ames et al., (2008) reported that all psychosocial variables significantly changed in a favorable direction throughout treatment except the Con Scale. Lafferty et al., (1999) reported that In spite of the Stage of Change, the Cons were consistently reported to be more relevant than the Pros by Cambodian smokers Ayar et al., (2019) concluded that there is a positive link between adolescents' views of the Cons of smoking and their actual smoking behaviors.

CONCLUSIONS

The lower the Stage of Change, the poorer the Self-Efficacy for hookah smoking cessation. In posttest II, the lower the Stage of Change, the more the used Processes of Change for hookah

smoking cessation. The higher the Stages of Change, the greater the Self-Efficacy and Decisional Balance for hookah smoking cessation.

ETHICAL CONSIDERATIONS COMPLIANCE WITH ETHICAL GUIDELINES

This study was completed following obtaining consent from the University of Baghdad.

FUNDING

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

AUTHOR'S CONTRIBUTIONS

Study concept, Writing, Reviewing the final edition by all authors.

DISCLOSURE STATEMENT:

The authors report no conflict of interest.

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