

## Efficacy of Health Belief Model-Based Training in Changing the Beliefs about Substance use

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### الخلاصة:

**خلفية البحث:** ترتبط مشكلات استخدام المواد مع زيادة التدرج الرجعي للصحة والضعف والموت بسبب التأثيرات وما يتجاوزها.

**الهدف:** الغرض من هذه الدراسة هو التعرف على فاعلية التدريب القائم على نموذج المعتقدات الصحية في تغيير المعتقدات حول تعاطي المخدرات بين طلاب الجامعات في مدينة الموصل.

**المنهجية:** تعتمد هذه الدراسة على التصميم التجريبي باستخدام نهج التجربة العشوائية المسيطر عليها. وعشوائية بسيطة. تم جمع البيانات في 1 / تشرين الاول / 2019 حتى 12 / أيار / 2020 باستخدام طريقة الاستبيان. تم جمع 80 طالب جامعي. تتكون الأداة من جزأين؛ الجزء الأول، متضمن لوصف الخصائص الاجتماعية والديموغرافية للطلاب مثل (العمر، والجنس، والصف، والكلية، والحالة الاجتماعية والاقتصادية) الجزء الثاني، تضمن استخدام المقياس لقياس معتقدات الطلاب تجاه تعاطي المخدرات.

**النتائج:** اوضحت نتائج الدراسة ان متوسط العمر والانحراف المعياري لمجموعة الدراسة والمجموعة السيطرة كان (20,09+23.37) و (20,04+23,70) على التوالي. بالإضافة الى ذلك، اظهر نفس الجدول ان غالبية المشاركين كانوا من وزن الجسم الطبيعي، وكان المتوسط العام والانحراف المعياري لمؤشر كتلة الجسم (20,53+21,23)، ومتوسط الدرجات والانحرافات المعيارية للمتغيرات قيد الدراسة كانت تغيرات بين المشاركين بمرور الوقت.

**الاستنتاجات:** استنتجت هذه الدراسة ان تصميم دراسة قائمة على نموذج المعتقدات الصحية يمكن ان تؤثر على فهم الطلاب وسلوكياتهم في مجال تعاطي المخدرات.

**التوصيات:** هذه الدراسة توصي بضرورة إجراء دراسات مستقبلية تستند الى نموذج المعتقدات الصحية على عدد كبير من العراقيين بهدف تغيير سلوك الناس اتجاه الامان.

**الكلمات المفتاحية:** فاعلية، نموذج الاعتقاد الصحي، استخدام المواد المخدرة.

### ABSTRACT

**Background:** Substance use problems are associated with capitalizes health retro gradation, weakness and death due to impacts and exceed.

**Objective:** The purpose of this study was to identify the efficacy of health belief model based training in changing the beliefs about substance use among university students at Mosul City.

**Methodology:** This study is based on experimental design by using the random controlled trial approach is conducted. A probability (simple random sample) of (N=80) undergraduate student. Data were gathered in 1st of October / 2019 till 12 of May / 2020 using a questionnaire method. The instrument consist of two

parts; part I, involved, to describe the student's socio-demographic characteristic such as (age, gender, grade, college ,socioeconomic status) the part II, involved the using scale to measure students' beliefs towards of substance use.

**Results:** demonstrated that the results of study the mean  $\pm$  SD age of the study group and control group was (23.37  $\pm$  2.09) and (23.70  $\pm$  2.04) respectively. In addition, the same table demonstrated that majority of participant were normal body weight, the overall mean ( $\pm$  SD) of the body mass index were (21.23  $\pm$  2.53), and the Mean scores and the Standard Deviations for the variables under the study were changed among participant's over times.

**Conclusion:** This study concluded that designing an HBM-based study could affect students' understanding and their behaviors in the field of substance abuse.

**Recommendation:** This study recommended there is a need to conduct future studies based on the Health

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## INTRODUCTION

Substance use disorders and intemperance represent universal public health problem of substantial socioeconomic inclusion <sup>(1)</sup>. Many clinical studies signalize that there is an association between substance use and personality troubles with guide that personality pathology may affect both the etiology and course of substance use troubles <sup>(2)</sup>. Substance uses problems are associated with capitalize health retro gradation, weakness and death due to impacts and exceed <sup>(3)</sup>. There is growing concern about the effects of conflict and wars on substance use in Iraq <sup>(4)</sup>. Students are among the groups with higher drug risk abuse because they don't know the illegal drugs' outcomes yet have no right convictions about them <sup>(5)</sup>. Substance use causes clinical, practical and significant sickness such as health problems, inability and defeat to meet responsibilities at work, school, house and university <sup>(6, 7)</sup>. Substance use and consequently its abuse is a common phenomenon seen among young adults.

In a survey conducted in 2010, it was found that approximately five percent of the young adult population (230 million) tried an illicit drug at least once. Of these, (27 million) were found to have "high-risk" substance use which posed a threat to their health, caused both psychological and social problems. Substance use disorders have caused about 300,000 deaths in 2015. Among these, alcohol use disorders, opioid use disorders, amphetamine use disorders and cocaine use disorders correspond to "137,500, 122,100, 12,200 and 11,000 respectively". Not only is alcohol use widespread in

Belief Model on large number of the Iraqi population with the goal of changing People's behavior about addiction.

**Keyword:** Efficacy, Health Belief Model, Substance use.

itself, it is also extremely prevalent because of its possible co-morbidity with most other disorders <sup>(8)</sup>.

According to reports of the Iraqi Ministry of Health in 2017, the number of smokers in Iraq was (31%) male, (4%) female. On the other hand, according to the statistics of the <sup>(9)</sup>, the number of alcoholics is (6.8%) for men, and (0.6%) for female. While, the number of drug addicts (illegal drug) in Iraq was around (7.2%). Health Belief Model this theory has been developed significantly and is considered the first theories that concern the behavior and beliefs of individuals <sup>(10)</sup>. The stated model was developed in the 1950s by some of United States (US) public health researchers with the purpose of improving the usefulness of health educations programs <sup>(11)</sup>. The health belief model was considered among the earliest theories of health psychology as a social cognition model, which focuses on increasing health security motives by adopting a healthy lifestyle <sup>(12)</sup>. The HBM has six construct that clarify or predict why individuals would take steps to avoid, monitor or test for a disease, including perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, cue to action and self-efficacy <sup>(13)</sup>.

## AIMS OF THE STUDY

The aim of this study is to identify the efficacy of Health Belief Model-based training in changing the beliefs about substance use among university students in Mosul City.

## METHODOLOGY

The research design for this study was an experimental, randomized controlled trial design<sup>(14)</sup>. To determine the efficacy of the HBM in changing the belief that about substance use among university students in Mosul City. The study is carried out in Iraq. In University of Mosul is a public university situated in Mosul. A probability (simple random sample) of (N=80) undergraduate student in different specialties would be selected. Data were gathered in 1st of October / 2019 till 12 of May / 2020 using a questionnaire method. A sampling pool consisted of 80 students distributed at four college in Mosul University included (Political Science, Engineering, Sciences, and Nursing Colleges). The sample will be randomly assigned into experimental and control groups of (40) undergraduate student for each group. The instrument consists of two parts; **part I:** involved, to describe the student's socio-demographic characteristic such as (age, gender, grade, college, socioeconomic status) the **part II:** involved the using scale to measure students' beliefs towards of substance use. This instrument developed from more than one source and includes<sup>(15,16,17,18, and 19)</sup>. This scale to developed on the rule of health belief model and included (6) major subscales and (3) secondary; (1): "the perceived susceptibility subscale", (2): "the perceived severity subscale",

(3): "the perceived benefits subscale", (4): "the perceived barrier subscale", (5): "the perceived cue to action", (6): "the perceived self-efficacy subscale". These secondary components include (7): "the perceived motivation subscale", (8): "the perceived behavioral control subscale" and (9): "the perceived behavioral intentions subscale" to changes in the student's beliefs about substance use. The overall scale consisted of 48 items measured in 5 points Likert scale distributed among the nine subscales to gauge the changes in HBM among students behavior.

The response for these items ranged between (1) strongly disagrees and (5) strongly agree, with a higher score indicating higher agreement of the beliefs. Data were analyzed by using Statistical Package for Social Science (SPSS) for Windows Version 25: We calculated mean, standard deviation, frequency and percentage to describing the participants of the study. Pearson chi-square and t-test were used to explore the homogeneity of characteristics between experimental and control groups at baseline test (T1). A mixed design analysis of variance (ANOVA) was used to measure changes in the health belief model concepts over three times (T1, T2, and T3) among groups. Finally, the Pearson correlation coefficient was used to calculate the liner correlation among health belief model concepts.

## RESULTS:

**Table (1): Demographical Characteristics and Homogeneity Between Experimental and Control Groups**

Anthropometric	Experimental (n=40)		Control (n = 40)		Total (n = 80)		t
	M	SD	M	M	SD	M	
Age	23.37	2.09	23.70	2.04	23.53	2.06	<b>0.230</b>
BMI	20.51	2.64	21.95	2.22	21.23	2.53	<b>0.283</b>
Characteristics	F	%	F	%	F	%	$\chi^2$
Gender							<b>0.694</b>

<b>Male</b>	36	90	37	92.5	73	91.25	
<b>Female</b>	4	10	3	7.5	7	8.75	
<b>Marital status</b>							<b>0.856</b>
<b>Married</b>	10	25	11	27.5	21	26.25	
<b>Single</b>	29	72.5	27	67.5	56	70	
<b>Divorced</b>	1	2.5	2	5	3	3.75	
<b>Residential unit</b>							<b>0.433</b>
<b>House owner</b>	29	72.5	32	80	61	76.25	

Table 1 showed demonstrated that the results of study the mean  $\pm$  SD age of the study group and control group was (23.37  $\pm$  2.09) and (23.70  $\pm$  2.04) respectively.

**Table (2): Baseline Homogeneity in the Health Belief Model Concepts, Motivation, Behavioral Control and Intentions between Experimental and Control Groups.**

Beliefs	Groups				t	p
	Experimental (n=40)		Control (n=40)			
	M	SD	M	SD		
<b>Perceived Susceptibility</b>	2.42	0.76	2.39	0.48	0.217	0.829
<b>Perceived Severity</b>	3.12	0.71	3.17	0.67	-0.339	0.736
<b>Perceived Benefit</b>	2.91	0.76	2.96	0.78	-0.288	0.774
<b>Perceived Barrier</b>	2.75	0.59	2.91	0.56	-1.229	0.223
<b>Cue to action</b>	2.31	0.70	2.27	0.61	0.211	0.779
<b>Self-Efficacy</b>	2.27	0.91	2.41	0.99	-0.643	0.522
<b>Motivation</b>	2.77	0.76	2.69	0.90	0.482	0.631
<b>Behavioral control</b>	2.83	0.99	2.73	0.54	0.573	0.568
<b>Behavioral Intentions</b>	2.81	1.05	2.92	0.86	-0.443	0.604

Table 2 showed that there were no significant differences in participant's beliefs, Motivation, Behavioral Control and Intentions at baseline (pre-test)

**Table (3): Results of Mixed ANOVA and Descriptive Statistics Measuring Change in Health Belief Model Concepts, Motivation, Behavioral Control and Behavioral intentions Across Study Groups and Over Times**

HBM Concepts	Groups	M (SD)			Multivariate F
		(T 0)	(T 1)	(T 2)	
Perceived Susceptibility	Ex	2.42 (0.76)	3.25 (0.41)	3.21 (0.46)	F (1, 78) = 25.416, p < <b>0.000</b> , $\eta^2 = 0.246$
	Co	2.39 (0.48)	2.44 (0.70)	2.51(0.62)	
Perceived Severity	Ex	3.12 (0.71)	3.89 (0.38)	3.82 (0.33)	F (1, 78) = 11.970, p < <b>0.001</b> , $\eta^2 = 0.133$
	Co	3.17 (0.67)	3.28 (0.79)	3.23 (0.64)	
Perceived Benefits	Ex	2.91 (0.76)	3.78 (0.41)	3.63 (0.90)	F (1, 78) = 7.877, p < <b>0.006</b> , $\eta^2 = 0.092$
	Co	2.96 (0.78)	3.13 (0.72)	3.11 (0.88)	
Perceived Barriers	Ex	2.75 (0.59)	2.69 (0.50)	2.70 (0.56)	F (1, 78) = 3.0527,

	Co	2.91 (0.56)	2.93 (0.51)	2.87 (0.70)	p = 0.064, η <sup>2</sup> = 0.043
Cue to action	Ex	2.31 (0.70)	3.18 (0.78)	3.35 (0.40)	F (1, 78) = 15.842, p = <b>0.000</b> , η <sup>2</sup> = 0.169
	Co	2.27 (0.61)	2.61 (0.62)	2.83(0.61)	
Perceived Self-Efficacy	Ex	2.27 (0.91)	3.22 (0.60)	3.26 (0.56)	F (1, 78) = 7.006, p = 0.010, η <sup>2</sup> = 0.082
	Co	2.41 (0.99)	2.56 (1.00)	2.55 (0.95)	
Motivation	Ex	2.77 (0.76)	3.62 (0.36)	3.58 (0.48)	F (1, 78) = 17.318, p = <b>0.000</b> , η <sup>2</sup> = 0.182
	Co	2.69 (0.90)	2.78 (0.77)	2.72 (0.91)	
Behavioral Control	Ex	2.83 (0.99)	3.38 (0.30)	3.36 (0.45)	F (1, 78) = 13.893, p = <b>0.000</b> , η <sup>2</sup> = 0.151
	Co	2.73 (0.54)	2.81(0.51)	2.89 (0.59)	
Behavioral Intentions	Ex	2.81(1.05)	4.07 (0.70)	3.71 (0.69)	F (1, 78) = 10.722, p = <b>0.002</b> , η <sup>2</sup> = 0.121
	Co	2.92(0.86)	3.08 (1.02)	3.04 (0.89)	

HBM: Health Belief Model, Ex: Experimental group (n = 40), Co: Control group (n = 40), M: mean, SD: Standard Deviation, Minimum beliefs score = 1, Maximum beliefs score = 5, η<sup>2</sup>: eta square, p < 0.05 indicated in bold.

Table 3 shows that the Mean scores and the Standard Deviations for the variables under the study were changed among participants over times. To determine the significance of this changes in the mean scores and if our health education session based on health belief model was successful in promoting enhancement among participant beliefs, a mixed design analysis of variance (ANOVA) was calculated. For this analysis (ANOVA) there was one between subject's factor (group with two levels: intervention and non-intervention and one with in subject factor (time of testing with three levels: pre-test, post 1, post 2).

**Table (4): Post-hoc using Bonferroni Corrections procedure for Beliefs and Variables Indicted Significant Changes over Times**

HBM Concepts	Groups	Post hoc Using Bonferroni		
		(T 0) vs. (T 1)	(T 0) vs. (T 2)	(T 1) vs. (T 2)
Perceived Susceptibility	Ex	<b>0.000</b>	<b>0.000</b>	1.000
	Co	0.929	0.663	0.871
Perceived Severity	Ex	<b>0.000</b>	<b>0.000</b>	1.000
	Co	0.488	0.728	0.935
Perceived Benefits	Ex	<b>0.000</b>	<b>0.000</b>	0.645
	Co	0.616	0.681	1.000
Cue to action	Ex	<b>0.000</b>	<b>0.000</b>	0.766
	Co	0.044	0.119	0.357
Perceived	Ex	<b>0.000</b>	<b>0.000</b>	1.000

Self-Efficacy	Co	0.776	0.808	1.000
Motivation	Ex	<b>0.000</b>	<b>0.000</b>	1.000
	Co	0.887	0.986	0.950
Behavioral Control	Ex	<b>0.001</b>	<b>0.001</b>	1.000
	Co	0.804	0.603	0.790
Intension	Ex	<b>0.000</b>	<b>0.000</b>	0.178
	Co	0.716	0.836	0.976

Based on estimated marginal means, the mean difference is significant at the 0.05 level. Adjustment for multiple comparisons: Bonferroni. HBM: Health Belief Model, Ex: Experimental group (n=40), Co: Control group (n=40),  $p < 0.05$  indicated in bold.

Table 4 showed the post-hoc procedure by using Bonferroni corrections test was conducted to determine where the differences among changed beliefs and variables exactly lie. This test revealed that the score of the changed beliefs and variables differed significantly among experimental group participants over times ( $p < 0.05$ ).

## DISCUSSION

Table (1) demonstrated that the results of study the mean  $\pm$  SD age of the study group and control group was ( $23.37 \pm 2.09$ ) and ( $23.70 \pm 2.04$ ) respectively. In addition, the same table demonstrated that majority of participant were normal body weight, the overall mean ( $\pm$  SD) of the body mass index were ( $21.23 \pm 2.53$ ). Concerning other demographic characteristics, the majority of participant were male (91.25 %), and house owner (76.25 %). Regarding marital status, most of participants were single (70 %). Tables (1) were consistent with the study (20) who found that no significant association has been shown between the difference in knowledge scores and certain sociodemographic variables such as gender, age, and education of parents, occupational status of fathers and house ownership.

This study agree with (21,22) ,This study indicated that life expectancy in university students between 21-24 years old age and body mass index were (21.16) consider normal body weight. This study disagreement with Nasir et .al. 2020) who found the majority of the sample were women (23). Table (2) showed that there were no significant differences in participant's beliefs, Motivation, Behavioral Control

and Intentions at baseline (pre-test). This implies the homogeneity of beliefs, Motivation, Behavioral Control and intention between experimental and control group. This study consistent with (24) in Iran also showed that there was no significant difference at the baseline attitude between students and they had a relatively negative attitude toward substances abuse.

These findings of the study is in line with the results of other studies by (25) who found there was no significant difference between the mean score of the HBM constructs ( $P > 0.05$ ) before the program application. The visual observation for Table 3 shows that the Mean scores and the Standard Deviations for the variables under the study were changed among participant's over times. To determine the significance of this changes in the mean scores and if our health education session based on health belief model was successful in promoting enhancement among participant beliefs, a mixed design analysis of variance (ANOVA) was calculated. For this analysis (ANOVA) there was one between subject's factor (group with two levels: intervention and non-intervention and one with in subject factor (time of testing with three levels: pre-test, post 1, post 2). All

effects were reported as significant at  $P < 0.05$ . This test showed that the changes among variables mean scores are a result of time, not of condition (group) or interaction between time of test and types of groups. Specifically, there was a significant main effect of time on participants perceived susceptibility,  $F(1, 78) = 25.416$ ,  $P < .000$ , perceived severity,  $F(1, 78) = 11.970$ ,  $P < .000$ , perceived benefits in changing the belief related to substance use,  $F(1, 78) = 7.877$ ,  $P < .000$ , Cue to action,  $F(1, 78) = 15.842$ ,  $P < .000$ , perceived self-efficacy to change in behaviors  $F(1, 78) = 7.006$ ,  $p = .000$ , motivation behavioral,  $F(1, 78) = 17.318$ ,  $P < .000$ , behavioural control,  $F(1, 78) = 13.893$ ,  $P < .000$ , and behavioral intentions to adapt behaviors in the futures  $F(1, 78) = 10.722$ ,  $P < .000$  (Table 3). However, this was one belief for which no statistically significant effect was identified.

These beliefs was related to the perceived barrier to substance use  $F(2, 94) = 1.958$ ,  $p = 0.147$  (Table 3). This study consistent with <sup>(26)</sup> in Iraq showed that the changes among beliefs mean scores is a result of time, not of condition (group) or interaction between time of test and types of groups. Specifically, there was significant main effect of time on participants perceived seriousness, perceived susceptibility, and perceived benefit. Table 4, showed, the post-hoc procedure by using Bonferroni corrections test was conducted to determine where the differences among changed beliefs and variables exactly lie. This test revealed that the score of the changed beliefs and variables differed significantly among experimental group participants over times

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( $p < 0.05$ ) (Table 4). The transitions period from (pre-test) to (post-test2) and from (post-test1) to (post-test 2) revealed that there was a continuous stable enhancement upon participant's beliefs (Table 4). Concerning the control group, the post-hoc procedures signaled the fluctuation of the beliefs mean score over times. However, no exact improvement or stable continuous significant changes in the score of variables were observed (Table 4). Therefore, we can conclude that the substance use health education sessions elicit statistically significant improvement upon participants in changing to substance use related beliefs and intentions over times.

## CONCLUSION

This study concluded that designing an HBM-based study could affect students' understanding and their behaviors in the field of substance abuse. Considering the positive correlation between construct of HBM, particularly in "perceived benefits and perceived severity" related to students beliefs. These beliefs implied a significant correlation with each other and with the attention to the prevention of addiction.

## RECOMMENDATIONS

This study recommended there is a need to conduct future studies based on the Health Belief Model on large number of the Iraqi population with the goal of changing People's behavior the direction of addiction.

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