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Efficacy of Health Beliefs Model –Based Intervention in Changing the Belief Related to Substance use Among University Students in Mosul City-Iraq

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Abstract

Aim: To determine the efficacy of health beliefs model –based intervention in changing the belief related to substance use among university student in Mosul city-Iraq.

Design: A randomized controlled trial.

Methods: A probability (simple random sample) of (N=80) undergraduate student in different specialties would be selected. The study sample will be recruited from (4) colleges in the University of Mosul's Engineering, Sciences, Medicine and Education Colleges. The sample will be randomly assigned into experimental and control groups of (40) undergraduate student for each group. Such chosen is employed of pool of topics that have the criteria contain students who have using on (Smoking, Hookah, Drug abuse and Alcohol).For during from 25of October / 2019 till 1 of February/2021. Data is analyzed using the "Statistical Package for Social Science" (SPSS) software for Windows (V:26).

Results: This finding indicated that before the intervention, mean scores for all concepts of HBM, add to Motivation, Control, and behaviors intensions of students they were almost equal. However, after the intervention were significantly different in the study group, while it was not significant in the control group.

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.

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KEYWORDS: Efficacy, Health Belief Model, Substance use, Intervention, University student

1.Introduction:

Substance use disorders (SUD) are significant health concern worldwide. Substance use is inveterate trouble which is associated with significant morbidity and mortality. These troubles also account for important health care employment and medical costs (Maqbool et al., 2019). Substance use disorders and intemperance represent universal public health problem of substantial socioeconomic inclusion (Whiteford, et al.,2015). Many clinical studies signalize that there is an association between substance use and personality troubles with guide that personality pathology may affect both an etiology and course of substance use troubles (Moran, et al., 2015).Substance use problems are associated with capitalize health retro gradation, weakness and death due to impacts and exceed (Mclellan ,2017). There is growing concern about the effects of conflict and wars on substance use in Iraq (Al Hemiery et al., 2017). It emerged that substance abuse can have an effect on society Systems do not only serve as a health concern but also as a social issue. And other opioid addictions, too health issues, coupled with social disadvantage (Silverman et al., 2018).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 (Panahi et al., 2018). Substance use "alcohol, tobacco, hookah and illicit drugs" is a big issue of the world today (Montazeri, et al., 2017). Substance use causes clinical, practical and significant sickness such as health problems, inability and defeat to meet responsibilities at work, school, house and university (Vahia , 2013).Usage of substance by young adults. In a 2010 survey it was found that approximately 27 million psychological and social disorders were triggered by the use of "high-risk" drugs that posed a danger to their health. Around 300,000 casualties in 2015 were caused by substance use disorders (Nelson, et al., 2015). In terms of drug use disorders, evidence now shows that during puberty, more than (85 per cent) of those who meet requirements for a drug use disturbance early in their lifetime do so. Unlike adulthood, which transmits adolescents without meeting requirements for a drug use problem, it is unlikely that one will ever grow (Hanson,2011).However, preparing college has historically been looked a defensive factor against the development of substance use troubles in new decades substance use has become one of the most diffuse health troubles on university in the United States (Schulenberg et al., 2017).

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According to the United States study on medicine and criminality the number of alcoholism users was between (155-250 million) in 2013, approximately (5.3- 7.5%) of the people aged 15 to 65 years old. (Khodaveisi et al., 2018), and SUD prevalence is expected to growing over time. Genetic factors involved in SUD etiology with factor implicated in the regulation of several neurobiological system (including dopaminergic and glutamatergic) found to be significant (Prom-Wormley et al.,2017). In 2017, (more 70,000 population) died from medicine overdoses unmatched the number of deaths from HIV, vehemence or traffic accidents at their peaks (Ahmad et al. 2018).Smoking use is the single most block able cause of death in the United States. Although the 2014 Surgeon General's statement the Health successive of Smoking (50 Years) of Progress, demonstrated that the spread of stream smoking is on the refuse the report confirms the need to further monitor types of use for all tobacco products, particularly as disparity in use persevere and alternative forms of smoking use are rising in publicity among young (Tsai, et al., 2019). Mousawi,2014, Found in Iraqi studies on secondary school and university students reported smoking use rates spreading from (3.2- 21%).However, to the World Health Organization (WHO), record (3.3 million) deaths in the world are attributable to alcoholism in 2012 (Busse et al., 2014), this statement specified that unintentional injuries comprised the second largest part of alcohol concerning deaths after cardiovascular diseases and that a large plurality of alcohol concerning deaths and injuries in the world are way traffic concerning and happen in developing countries. The most common age ambit of narcotic abusers in the world is (18 -25) years. Some of students are at these ages and narcotic abuse increase has been showed in them, among illegal drugs with consuming of (3.8%) is the most common abused narcotic in the world (Rezahosseini et al, 2014). The country of Iraq expects a population of 39.2 Million, Iraq is one of the West Asian countries bordering the Arabian Gulf. It is bordered by "Turkey in the north, Kuwait and Saudi Arabia in the south, Syria and Jordan in the west, and Iran in the east". Iraq's geographical position is also another agent that makes Iraq vulnerable to drug use, due to the long and spongy border between Iraq and Iran, as Iran is facing increasing and severe substance use problems (Mahmood et al.,2018). Substance use is expanding particularly among young people who are always in high school and university students (Goreishi and Shajari., 2013). Consequently, the distribution in Iraq of lifetime uses of "alcohol, licit or illicit substances" was at least 10.3 percent (Al-Hemiery et al., 2017).According to reports of the Iraqi Ministry of Health in

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2017, the number of smokers in Iraq was (31%) male, (4%) female. On the other hand, according to the statistics of the (WHO,2014, Smith&Foster,2014), 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%).University students, aged (18-24) is duration of quick economic, social, and cultural transmission in Iraq which has produced a suitable condition for growing socially upset types of smoking, hookah, narcotic and alcohol use. Substance use is increased trouble in Iraq, as in many developing countries. In Iraq colleges' students are very a substantial class that is susceptible to depend on the drugs. This is a very earnest trouble that worries both the population and government. Addiction among youth in Iraq is associated with public health troubles such as poverty and school truancy. The most recent study in Iraq found that (41.7%) of students are smokers, and this allows the awful statement that smoking is considered an admission to the use of other illegal drugs, which can in turn destroy your life with alcohol and brain effects (Mahmood et al., 2018).

2. Background:

The HBM notes that if a person suspects that he or she is vulnerable to a serious health condition, the person is supposed to feel that the advantages outweigh the barriers associated with modifying his or her conduct in order to avoid the problem. The model of health belief is a fantastic tool for nurses to provide them with a theoretical structure to help their patients avoid chronic illnesses or enhance the quality of life if illness is present (Orji et al.,2012). The Health Belief Model theoretical constructs originate from theories in Cognitive Psychology (Glanz et al., 2015). The expectation is that a certain health action could prevent the condition for which people consider they might be at risk. The HBM suggests that your belief in a personal threat together with your belief in the effectiveness of the proposed behavior will predict the likelihood of that behavior (Ban & Kim, 2020). The HBM is one of the theories of individual (Intrapersonal) behavior that focuses primarily on an individual's awareness, attitude and actions. For nearly eighty years, HBM has been used effectively to foster good safe behaviors (Msengi,2019). HBM was mostly used to explain why some people support condition-prevention behaviors and others do not (Hosseini, et al 2017).There is no question that the actions of individuals play a vital role in assessing the degree of their physical, psychosocial comfort (Sarafino and, Smith, 2014). In the last twenty years, the progress of medical and health sciences has

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alerted staff in these fields to the need to fulfill human habits that avoid illness or disability (Brannon et al., 2013). In fact, motivating people to change their risky behaviors when they perceive that the disorders serious, otherwise, they may not tend to behave wisely enough in respect to their health toward dangers (Khani ,et al ., 2015)The reason why HBM has made such an important contribution to the health sector is that it has been built to help recognize faulty values and to identify individual barriers to adequate participation in programs to prevent and diagnose diseases. Health educators will be better prepared to develop interventions that resolve mistaken values and maladaptive behaviors by identifying and recognizing these obstacles (Henshaw & Freedman-Doan, 2009)

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 (Louis, 2016).

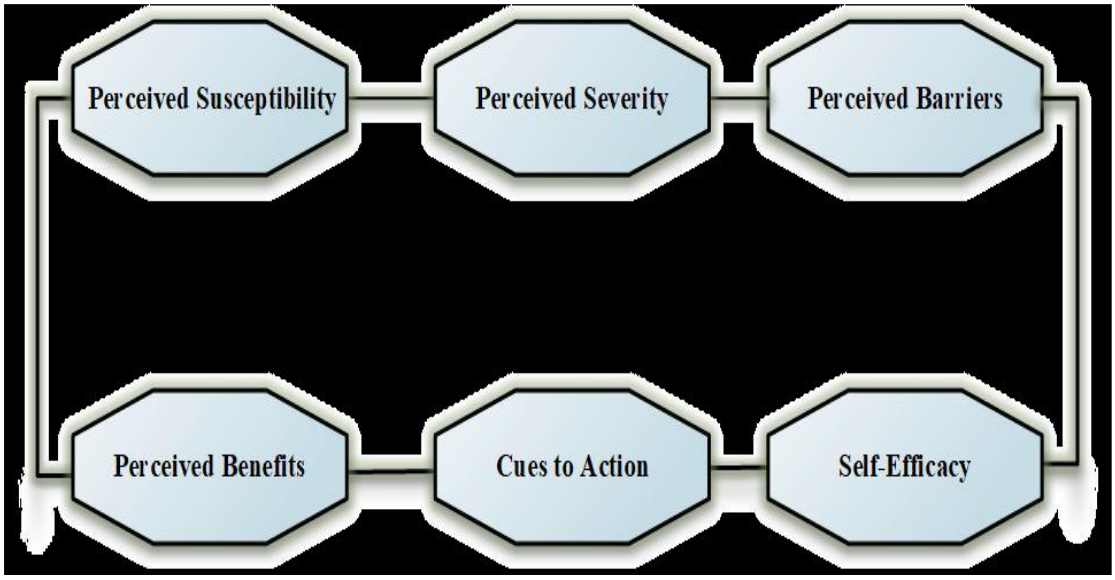

Figure (1): The Health Belief Model Concepts

Perceived susceptibility of an individual understands of the risk of getting a certain condition; i.e., substance users should believe they susceptible to suffer from diseased effects of substance use tobacco, alcohol and drug abuse (Renuka & Pushpanjali, 2014).The perceived severity of a person's perception of how severe this disorder is, i.e. substance consumers should be aware of the disease effects of drug users such as (tobacco, drug misuse and alcohol consumption) due to addiction that affects health and everyday life consequences of diseases. They should also be seen by him/her as a threat and may occur to him/her (Franklin, 2017) .Perceived benefits

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Refer to the evaluation by an individual of the effectiveness of participating in a health-promoting action to minimize the risk of an illness (Louis, 2016).Perceived barrier refers to a person's feelings about the barriers to taking a desired action on safety. There is wide variation in the person's feelings of barriers, or impediments, leading to an analysis of cost / benefit (Begun., 2020).Cues to action are external events which prompt a desire to make a change in health. A prompt to action is something that helps drive someone to actually make the change from trying to make a health change (Jones et al., 2015).Self-efficacy refers to the confidence in one's own ability to attain a certain level of the role is an important concept in the development of addict treatments(Ali, et al.,2021). Substance use and addiction are a major public health concern that is increasingly expanding across the world, affecting consumers, their communities and their environments causing psychological and economic problems for health and crippling societies, with a growing decrease in consumer age (Öztas, et al., 2018).Tobacco use and also substance abuse clearly has negative consequences for the health of young people. The prevalence of cigarette smoking in the United States was reported at 20.8 per cent, (Kabir,et al,2016) as 22% in the United Kingdom, and as 19.2% in the Iraq (de Coninck & Gilmore, 2020).Dependence on alcohol is linked to increased mortality and morbidity (Kendler et al, 2016). There is a relationship between excessive alcohol consumption and smoking, and a common genetic vulnerability to nicotine and alcohol dependence in men. Substance use affects almost all organs of the human body. Consumption of alcohol can influence not only the occurrence of illnesses, but also the course and outcomes of disorders in individuals (Honnamurthy, et al, 2018).Drug misuse also known as substance abuse where the user absorbs the drugs in quantities or with strategies that are detrimental to him or her or to others. The term has a broad variety of meanings, but in short substance abuse it means dependency on taking a psychoactive drug or enhancing drug output, e.g., Aphrodisiac, but some of the most often associated with this term include alcohol, barbiturates, benzodiazepines, cocaine and opioids. It may lead criminal penalty, physical, social, psychological harm, strongly depending on local jurisdiction (Bruce et al., 2012). Data from the (Services, U. S. D. of H. and H. 2014) show that 6.8 million people aged 12 and older are actually non-medical users of psychotherapeutic medications and 4.9 million of these were pain relievers.

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3.Methodology:

3.1. Design of the Study:

True experimental design by using the random controlled trial approach is conducted to determine the efficacy of the HBM in changing the belief related to substance use among university students in Mosul City for during from 25of October / 2019 till 1 of January /2021,

3.2. Ethical Considerations:

Students, who have sharing in the study, have signed consent form for their agreements for the sharing in the study and the participants informed that their participation is voluntary and the information will be treated confidentially and used for the research purposes only

3.3. Setting of the Study:

The study is carried out in Iraq. In University of Mosul is a public university situated in Mosul. It's one of the largest educational and research centers in the Mosul City, and the second largest in Iraq, behind the University of Baghdad. Contain of 22 college in different specialties divided to four colleges in the University of Mosul's Engineering, Sciences, Medicine and Education College. Mosul University is located in the north side of the center of Mosul City at the right braid of the Tigris River.

3.4. Sample of the Study:

A probability (simple random sample) of (N=80) undergraduate student in different specialties would be selected. The study sample will be recruited from (4) colleges in the University of Mosul's Engineering, Sciences, Medicine and Education Colleges. 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 and are evenly distributed with esteem to their age and the colleges. Such chosen is employed of pool of topics that

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have the criteria contain students who have using on (Smoking, Hookah, Drug abuse and Alcohol).

3.5. Randomization:

The university was divided into four main colleges, namely the Sciences groups, Engineering, Medical and Humanities faculties. A college was selected from each group included the Faculty of Science, Nursing, Engineering and Political Science chose four colleges using simple random sampling methods. Was selected 406 Students of 4 faculties of Mosul University by using simple random sampling method. Including (123) Student, is used (Alcohol, Smoking, Drug) and (80) eligible students were randomly assignment selected. The subject's acceptance to sharing in the study acquired during the using of a specialized consent form (Appendix H). The random assignment of subjects separated into (2) groups: "study and control group" each with the same characteristics are conducted by prosecution a simple randomization technique. Each sharing assigned specified number, and then the random distribution number created by using "Statistical Package for the Social Sciences" software. Final step of this randomization resulted in forty subjects in experimental group (ten subjects from Engineering College, ten subjects from Sciences College, ten subjects from Nursing College and ten subjects from Political Science Colleges), and forty subjects in control group (ten subjects from Engineering College, ten subjects from Sciences College, ten subjects from Nursing College and ten subjects from Political Science Colleges).

3.6. Construction of the Interventional Program.

The education program has been developed acceding to the results of the assessment of the students' needs, about health belief model in changing the belief related to substance use, it is based on the reviewed of the related, scientific literature, previous studies and through the researchers' experience. Therefore, an interventional program is constructed and applied according to result of student's needs. The researcher intended students for this health education program by separating the sample into (2) classes (group of research and control group). The group of research is exposed to the health education program intervention only. The program is collected of three main sessions; it has been implemented upon (40) students during three

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classroom sessions. Pre-test is conducted prior implementation of the health education program by the final drafts of data collecting instrument.

3.7. Instrument of the Study:

The data for this study was collected by using questionnaire contain 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(El-Rahman Mona,et.al,2014; Hall, D. H., & Queener, J. E. ,2007; Manning, K.,et.al,2018; Nobiling, B. D., & Maykrantz, S. A. 2017; Luoma, J. B.,et.al, 2010).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 (Appendix E). 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 disagree and (5) strongly agree, with a higher score indicating higher agreement of the beliefs.

3.8. Pilot study:

Before data collecting a pilot study is initiated for period from 7th January to 16th January 2020. Ten participants are selected and excluded from the major sample; pilot study is fundamental to perfect the following objectives:

1. To evaluate the instrument contents adequacy, relevancy, and clarity.

2. To identify the study barriers

3. To identify the obstacles that may be encountered in the research.

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4. To evaluate the validity& reliability of the study questionnaire.

5. To guess the amount of time that each interview could take.

3.8.1. Validity:

The validity of the questionnaire is tested by presenting it to (11) experts in nursing, education and medical fields (Appendix G). According to the expert's recommendations some items are changed and other are modified, on the other hand, the review of former studies indicated that using students' beliefs toward of substance use scales demonstrated a good validity and accepted reliability (Mona, et.al,2014; Hall, D. H., & Queener, J. E. ,2007; Manning, K., et.al,2018; Nobiling, B. D., & Maykrantz, S. A. 2017; Luoma, J. B., et.al, 2010).

3.8.2. Reliability:

Reliability of test-retests was used to establish reliability of the study instrument. Pearson correlation coefficient was computed on responses of (10) students at university of Mosul/Mosul City. Findings of this computation signal that the correlation coefficient is approbative that the instruments were highly reliable measures for the phenomenon implicit the current study (Table 3-2).

Table: 1: Test-retest Reliability for the Study Instrument

Test-retest Reliability	Item	Pearson Correlation Coefficient
perceived susceptibility subscale	4	0.785
perceived seriousness subscale	10	0.805
perceived benefit subscale	4	0.835
perceived barrier subscale	5	0.788
Perceived cues to action	3	0.847
Perceived self-efficacy	2	0.737
Perceived motivation	8	0.755
Perceived behavior control	8	0.706
Perceived intension	4	0.794

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Total=0.78

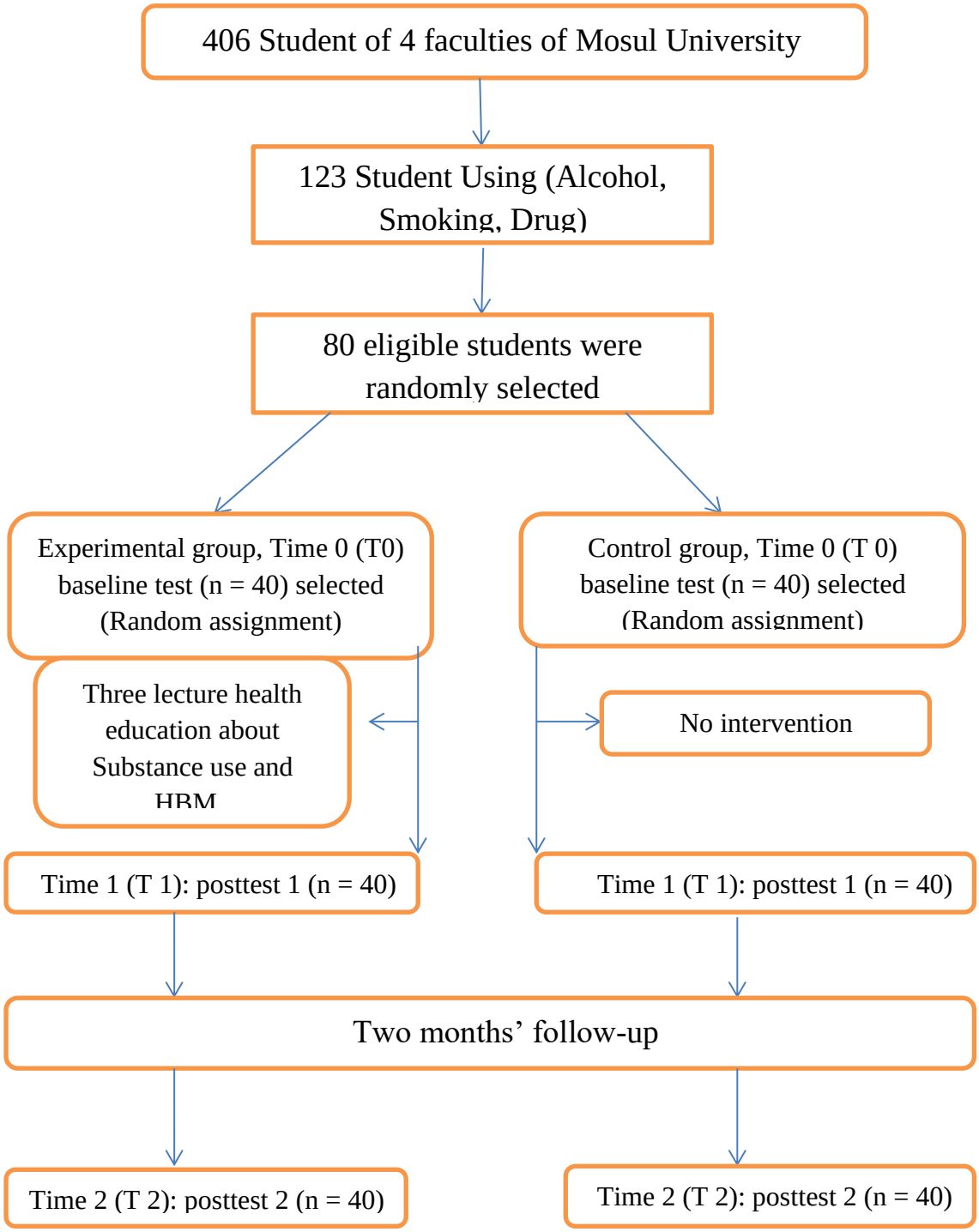

Figure (2): Flowchart of the sampling process

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3.9. Data Collection

The data are collected from students in University of Mosul of selected 22 colleges in Mosul City. They are four colleges in the University of Mosul's Political Science, Engineering, Sciences, and Nursing Colleges, from the period from 19 of January up to the 27 of February / 2020 (Appendix B).

3.10. Data analysis:

Data is analyzed using the "Statistical Package for Social Science" (SPSS) software for Windows (V:26). We calculated mean, standard deviation, frequency and percentage to describe the entrant of the study. Pearson chi-square and t-test are used to explore the homogeneity of characteristics between experimental and control groups at baseline (T0) test.

4.Results

Table 1: Demographical Characteristics and Homogeneity Between Experimental and Control Groups

Socio-demographic	Experimental (n=40)		Control (n = 40)		Total (n = 80)		*t*
	M	**SD**	**M**	**SD**	**M**	**SD**	
Age	23.37	2.09	23.70	2.04	23.53	2.06	**0.230**
BMI	20.51	2.64	21.95	2.22	21.23	2.53	**0.283**
Characteristics	**F**	**%**	**F**	**%**	**F**	**%**	χ^2
Gender							**0.694**
Male	36	90	37	92.5	73	91.25	
Female	4	10	3	7.5	7	8.75	
Marital status							**0.856**
Married	10	25	11	27.5	21	26.25	
Single	29	72.5	27	67.5	56	70	
Divorced	1	2.5	2	5	3	3.75	
Residential unit							**0.433**
House owner	29	72.5	32	80	61	76.25	
House rent	11	27.5	8	20	19	23.75	

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Table 1 shows that the study participants were 80 students between 18 - 27 years old, and the overall mean age for the participants was 23.53 (*SD* = 2.06). Concerning body mass index (BMI) most of participants were normal body weight. The overall mean BMI for participants was 21.23 (*SD* = 2.53). Regarding other demographic characteristics, most of participants for the experimental group were male (90%) single (72.5%) and house owner (72.5%). For the control group most of participants were male (92.5%) unmarried (67.5%) with house owner (80%).

Table 2: Distribution and Homogeneity of Behavioral Habits Between Experimental and Control Groups

Behavioral habits	Experimental (n=40)		Control (n=40)		Total (n=80)		χ^2
	F	%	F	%	F	%	
Smoking and Hookah	**24**						**0.949**
Currently smoking	21	87.5	16	66.66	37	77.08	
Smoke intermittent	3	12.5	8	33.34	11	22.92	
Alcohol consumption	**7**						**1.810**
1-2 drinks/day	1	14.28	2	28.58	3	21.43	
3-4 drinks/day	1	14.28	0	0.0	1	7.14	
5 drinks or greater /day	0	0.0	0	0.0	0	0.0	
1-2 drinks/weekly	2	28.58	1	14.28	3	21.43	
1-2 drinks/monthly	3	42.86	4	57.14	7	50	
Drug abuse	**9**						**2.476**
1-2 drinks/day	3	33.33	3	33.33	6	33.33	
3-4 drinks/day	0	0.0	1	11.11	1	5.56	
5 drinks or greater /day	4	44.45	2	22.22	6	33.33	
1-2 drinks/weekly	1	11.11	3	33.34	4	22.22	
1-2 drinks/monthly	1	11.11	0	0.0	1	5.56	

According to the (Table 2) most of participant in the experimental group were currently smoker (87.5%), then followed intermittent smokers approximately (12. 5%); As for alcohol consumers, the proportions were distributed between a user (1-2 daily) and (3-4 daily) at a rate of (14.28%), (1-2 a week) at a rate of (28.58%) and the last (1-2 monthly) at a rate of (42.86%); Likewise, the use of drug shows the highest percentage (44. 45%) taking drugs 5 or more times a day. For the control group, as well the majority of participant were currently smokers (66.66%) then followed intermittent smokers approximately (33. 34%); The most use of alcohol is (1-2drinks/monthly) approximately (57.14%). Finally, the use of drug shows the high

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rate (33.34%) take drug (1-2 drinks/weekly). There were no statistically significant differences in the baseline behavioral habits between the groups (Table 2).

Table 3: Baseline Homogeneity in the Health Belief Model Concepts, Motivation, Behavioral Control and Intensions Between Experimental and Control Groups

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

M: mean; SD: Standard Division; t: t-test; (p): P-value; Minimum value for health belief model constructs= 1; Maximum value for health belief model constructs= 5

The results of this table indicate that there was no statistically significant difference ($p > 0.05$) in the health beliefs model concepts, motivation, Behavioral control and Behavioral Intensions at baseline (pre-test).

Table 4: Descriptive Statistics Measuring Change in Health Belief Model Concepts, Motivation, Behavioral Control and Behavioral Intensions Across Study Group and Over Times.

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HBM Concepts	Groups	*M (SD)*		
		(T 0)	(T 1)	(T 2)
Perceived Susceptibility	Exp	2.42 (0.76)	3.25 (0.41)	3.21 (0.46)
	Con	2.39 (0.48)	2.44 (0.70)	2.51(0.62)
Perceived Severity	Exp	3.12 (0.71)	3.89 (0.38)	3.82 (0.33)
	Con	3.17 (0.67)	3.28 (0.79)	3.23 (0.64)
Perceived Benefits	Exp	2.91 (0.76)	3.78 (0.41)	3.63 (0.90)
	Con	2.96 (0.78)	3.13 (0.72)	3.11 (0.88)
Perceived Barriers	Exp	2.75 (0.59)	2.69 (0.50)	2.70 (0.56)
	Con	2.91 (0.56)	2.93 (0.51)	2.87 (0.70)
Cue to action	Exp	2.31 (0.70)	3.18 (0.78)	3.35 (0.40)
	Con	2.27 (0.61)	2.61 (0.62)	2.83(0.61)
Perceived Self-Efficacy	Exp	2.27 (0.91)	3.22 (0.60)	3.26 (0.56)
	Con	2.41 (0.99)	2.56 (1.00)	2.55 (0.95)
Motivation	Exp	2.77 (0.76)	3.62 (0.36)	3.58 (0.48)
	Con	2.69 (0.90)	2.78 (0.77)	2.72 (0.91)
Behavioral Control	Exp	2.83 (0.99)	3.38 (0.30)	3.36 (0.45)
	Con	2.73 (0.54)	2.81(0.51)	2.89 (0.59)
Behavioral Intentions	Exp	2.81(1.05)	4.07 (0.70)	3.71 (0.69)
	Con	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

Table 4: indicated that before the intervention, mean scores for all concepts of HBM, add to Motivation, Control, and behaviors intensions of students they were almost equal. However, after the intervention were significantly different in the study group, while it was not significant in the control group. The difference was higher among the intervention group than the control group and it was positive for all concepts except for perceived barriers. This issue indicates that education caused significant increase in scores of sensitivities, severity, perceived benefits, cues to action, self-efficiency, motivation, behavioral control and intensions. It further reduced perceived barriers of students in the intervention group.

The visual observation for (Table 4) shows that the Mean scores and the Standard Deviations for the variables under the study were changed among participant's over times. To

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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.

Table 5: Intercorrelations Between Health Beliefs Model Concepts, Motivation, Behavioral Control and Intentions to substance use among Experimental **Group Participants (n= 40):**

	Variables	1	2	3	4	5	6	7	8
Baseline test (T 0)	1. SU								
	2. Severity	-0.050							
	3. Benefit	0.049	**0.253****						
	4. Barrier	-0.296	0.271	**0.512****					
	5. CA	0.149	-0.173-	0.305	-0.086				
	6. SE	-0.153-	0.186	-0.051	0.098	-0.119			
	7.MO	-0.053-	0.113	0.303	0.273	-0.093	0.192		
	8. BC	0.001	-0.209	0.278	0.129	0.073	0.257	**0.562****	
	9. BI	0.067	0.182	**0.401***	0.158	0.132	0.204	0.162	0.128
Post-test 1 (T 1)	1. SU								
	2. Severity	0.094							
	3. Benefit	-0.090	**0.266****						
	4. Barrier	-0.059	**0.358***	**0.428****					
	5. CA	0.299	-0.028	-0.027	0.180				
	6. SE	0.066	0.245	0.094	0.194	0.116			
	7.MO	0.082	-0.022	**0.317***	**0.335***	0.038	0.165		
	8. BC	-0.196	0.074	0.291	0.157	0.061	**0.399***	0.060	
	9. BI	0.160	0.137	**0.319***	0.253	0.196	0.215	0.271	0.019
Post-test 2 (T 2)	1. SU								
	2. Severity	-0.095							
	3. Benefit	0.020	**0.489****						
	4. Barrier	0.085	**0.320***	0.218					
	5. CA	-0.072	**0.423****	0.251	**0.403****				
	6. SE	-0.156	0.110	0.091	0.044	0.225			
	7.MO	-0.062	0.220	0.214	**0.413****	0.088	0.021		
	8. BC	0.077	0.057	0.212	-0.280	-0.144	0.198	0.173	
	9. BI	0.073	0.217	**0.502****	0.292	**0.397***	0.239	0.230	-0.029

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

CA: Cue to action, SE: Self-Efficacy, MO: Motivation, BC: Behavioral Control, BI, Behavioral Intensions

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5. Discussion:

The findings showed a positive influence of health education on the improvement of student beliefs in preventive addiction based on the Health Belief Model. In particular, the participants found post-education that substance use is a serious condition for substance use if they did not participate in preventive substance use behaviors. In addition, the perceived susceptibility, perceived benefits, cues to action, motivation, control, perceived self-efficacy and intentions of participants in modifying perceptions about substance use behaviors in the future were significantly improved after intervention with health belief model-based health intervention. According to the results of (Table 1), the mean ± SD age of the study group and control group was (23.37 ± 2.09) and (23.70 ± 2.04) respectively. In addition, the same table demonstrated that majority of participant were normal body weight, the overall mean (± SD) of the body mass index were (21.23 ± 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 %). Table (1) this study is consistent with (AL-Hemiery et.al 2017) who found that the male participants reported a significantly higher prevalence of tobacco use, alcohol use, and drug abuse compared to females. On the other hand (Table 2) illustrated that the most of participants were using smoking and hookah (60 %), Alcohol abusers (17.5 %) and drug abusers (22.5 %). Similar to this research (Goings, Hidalgo, & McGovern, 2018), the use of smoking during adolescence was one of the best predictors of incessant smoking habits (57 percent). This result is consistent with the study in Baghdad 2017 found that lifetime prevalence of alcohol use in Baghdad was 17.8% and drug use prevalence was 7.02% (Al-Hemiary, Al-Diwan, Hashim, & Abdulghani, 2017). These increases in the use of alcohol, prescription drugs, and illicit drugs may indicate an increase in substance use disorders in the country and, therefore, an increased need for treatment interventions. Tables (1, 2) interpretation shows that the sample was homogeneous among themselves because the application of (randomized controlled trials (RCTs) one of its prerequisites must be pool homogeneous, and for this the application of (RCTs) is considered the best way to study efficacy to solve a specific problem through the application of (HBM), so the results of the two groups (study and control) appeared homogeneous. This study is similar with (Kissal & Kartal,2019), who found the average age of students was

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(21.21 ± 2.90). About 97.9% were single, 72.9% of them had low family income, and 81.3% lived in a house owner. Table 3 showed that there were no significant differences in participant's beliefs, Motivation, Behavioral Control and Intensions at baseline (pre-test).This implies the homogeneity of beliefs, Motivation, Behavioral Control and intention between experimental and control group. An explanation of this table (3) it is normal in the initial test of the two groups (Experimental & Control) that their knowledge and belief about the substance use is little or weak because they are not exposed to a program, as well as the fact that the two groups are homogeneous among themselves, the results are convergent and logical. This outcome is consistent with the research (Mahmood, et al., 2018) that showed the homogeneity of students awareness participants regarding the harms of substance use. According to the results of (Table 4), there was an increase in the value of the (perceived susceptibility, perceived severity, perceived benefits, cues to action, self-efficacy, motivation, behavioral control and intensions) over time, and there was decrease in the value of perceived barriers over time. Based on the findings, there was no substantial difference between the mean score of beliefs before the intervention of the research and control groups, but the difference was substantial after the experiment and indicates the positive effect of the health education in changing students' health beliefs about substance use and minimizing students' perceived barriers of substance use. Table (4) as we mentioned earlier in this chapter, a pre-test was administered for both (study and control groups) prior to implementation of the intervention. The study (experimental) group participants were exposed to the interventions only. The pretest results revealed that the mean of participants in study and control groups is unaccepted (table 4). This means that the students' belief was low prior to implementation the intervention at pretest. It was also found that there were no statistically significant differences between study and control groups ($p > 0.05$) in the score of the students' beliefs towards all concepts of Health Belief Model related to substance use at pretest (table 4). This means that all students who participated in the study (study and control groups) were homogeneous and they had the same information and knowledge about substance use at baseline. After that, all sessions of the intervention had been given for study group participants only. After completion the intervention, a posttest-1 was carried out for both groups (study and control) .The results showed that there was a clear change in mean except for perceived barriers. This indicates that the interference has become positively affected .The main purpose

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of this step was to evaluate the outcomes of the educational program. And then after (2) months, a posttest-2 was also performed for both groups to investigate the efficacy of the education program. The main purpose of this step was to identify the efficacy of the educational program in retaining adequate information and knowledge by the study group participants. This research is consistent with the findings of studies performed on target group on substance use and the impact of education on the health belief model (Solhi &Abolfathi, 2013; Shojaei et al., 2014).This result is consistent with the study of (Bronchia , et al., 2012) showed that there is a significant correlation between the health belief model parts and preventive behaviors of addiction and drug abuse and also a significant correlation between the variables of students and (HBM) in preventive behaviors of drug abuse (P=0.002).This outcome is consistent with the (Fadaei et al., 2020) study that showed that there is a post-test level, the mean intervention and control groups scored substantially different; the preventive substance abuse in the intervention group, behaviors and their dimensions changed (p value < 0.001and t = 14.57).In line with this study (Mahmood et al., 2018) who found after the introduction of a health education program, the awareness of drug use by students has increased significantly and this reflects the effectiveness of health education program to enhance the awareness of substance use amongst students. Table 5: demonstrates the association between health belief model concepts, Motivation, Behavioral control and intentions to substance use among the experimental group over times.

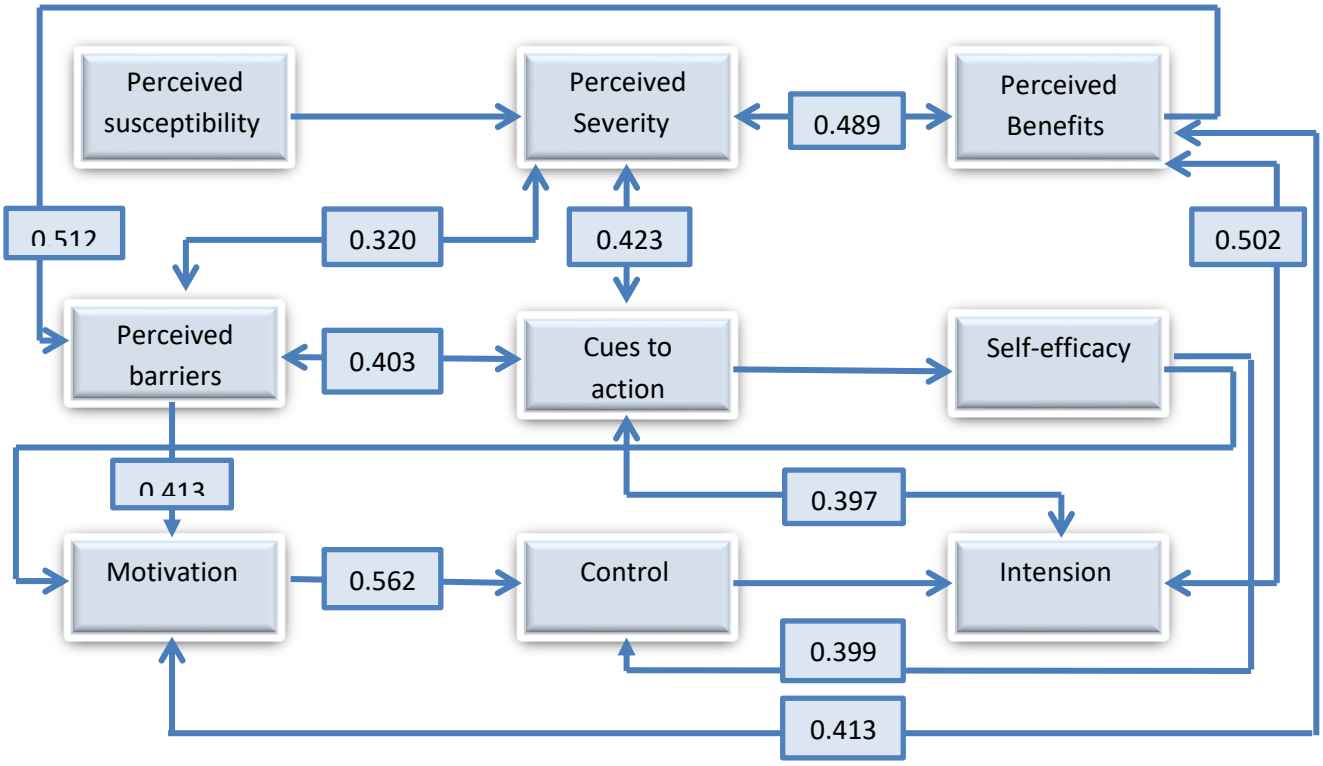

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Figure 2 .Correlations between Health Beliefs Model concepts for the experimental group

Pre-test there was positive significant correlation between participants' perceived seriousness of substance use and their perceived benefit in preventing addiction.This explains that participants feeling about the importance of health education programs in preventing addiction is increased as they felt about severity of substance use. The correlational analysis at same time (T 0) also revealed that there was a strong correlation between perceived benefits and perceived barriers, also association between behavioral motivation and control. This result indicates that participants willing to motivate and control in changing beliefs related to substance use are associated with their Behavioral intentions. Many beliefs and variables showed significant correlations at posttest 1 (post-1) (see Table 5). These new correlations may be explained in the term that is emerged as a result of our substance use related health educations. There was positive significant correlation between participants' perceived severity and their perceived benefits, and perceived severity and perceived barriers of substance use over time. This implies that participants who perceive that they are highly seriousness are more prone to addiction or substance use. This study consistent with (Bonar and Rosenberg, 2011), they suggested that there was a strong significant association between perceived intensity and perceived benefits. These results were consistent with (Jaberee, et al., 2019) who found that the perceived susceptibility had a strong positive association with both of the perceived severity and perceived benefits. Because the threat process consisted of both the perceived seriousness and perceived susceptibility.On the other hand, there was positive significant association between participants' perceived benefits of substance use and each of perceived barriers, motivation and intensions can be explained in the term that the participant's beliefs about the benefits of substance use. This implies the higher perceived benefits related to the feeling about their susceptibility to prevent addiction and benefits of health education in preventing addiction. Similar to (Albashtawy et al.,2015), this study showed that the perceived obstacles and perceived benefits have a strong positive association. This study consistent with (Mazloomy, et al., 2017) who found their correlation between all concepts of HBM, in particular among perceived benefits and intension.Finally, the associations between Motivation and perceived barriers and self- efficacy and behavioral control were important since this explained that the participants willing to increase the beliefs

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related to substance use in changing behavioral. This may reveal that when the student's belief about substance use is improved, their beliefs about seriousness of addiction is also increased. At post-test2 many of the variable that shows significant correlations at (T1) continued in correlation at this time (T2) indicating stability of correlation after three months' form health education. However, the correlation between severity and benefit, barriers and cues to action were the belief that indicated continuous stable associations over three time. This association overtimes were in paramount important since the two beliefs showed the ability to change through health education process (Table 5). Furthermore, there was significant correlation between participants' perceived benefits and intension, and cues to action and intension. This implies that students who use Strategies to activate "readiness" to quit within substance user, they were more confident in their ability to terminate use of substance. This result indicates that if we want to stimulate students to changing beliefs, our substance use related health educations programs should be focus upon the seriousness of substance use and benefits in preventing addiction. This finding demonstrates the success of the current curriculum and can be attributed to the content of the instructional program based on the literature of the previous program related to the use of drugs and the procedures used in the presentation of the program. Who played a crucial role in teaching students about the effects of substance use? This finding is consistent with (Solhi, & Abolfathi, 2013) who found their positive correlation between knowledge and HBM scores before and after education (r=.31, r=.37, p<.0001).These results are consistent with the study of (Oveisi, et .al.,2019)These results indicate that correlation test showed a significant positive correlation between the means indicators of this HBM (Perceived sensitivity, perceived severity, perceived benefits, perceived barriers, Cues to action and self-efficacy) with socioeconomic status .Ultimately, the results showed the using HBM in educational intervention significantly improved in changing the beliefs of students behavioral in preventing substance abuse in the experimental group compared to the control group. In this respect, several studies have been consistent with these findings (Maheri et al., 2017; Ahmed et al., 2018) on HBM efficacy in enhancing students' healthy behaviors.

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6. Limitations:

This study has many limitations that need to be considered. Some of these restrictions are common in such research inducing incorporated to highlight future research avenues. Security situation, protesting and the frequent holidays during the period of the study hampered data collection. Due to the Corona pandemic, the researcher was forced to use the social spacing method to prevent infection. difficulty in students' access to a program space due to the COVID-19 pandemic and Lack of relevant literature for such educational program.

7. Conclusion:

This study concluded that the health education through a health belief model demonstrates the importance of substance use prevention and has a positive impact on student perceptions of perceived susceptibility, perceived severity, perceived benefits of advised substance use stopping interventions in the prevention of addiction and reduction of different health hazards, Cues to action for activate "readiness" to quit within substance user and self-efficacy for confidence in their ability to terminate use of substance.

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Conflict of interest:
The authors declare that they have no competing interests

Data availability statement:
The data that support the findings of this study are available on request from the corresponding author

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