ORIGINAL ARTICLE

EFFECTIVENESS OF EDUCATIONAL PROGRAM UPON HIGH-SCHOOL STUDENTS' KNOWLEDGE TOWARD DRUG ADDICTION

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ABSTRACT

The aim: 1. To assess the existing knowledge of high-school students regarding drug addiction. 2. To measure the effectiveness of planned teaching program upon study groups knowledge on drug addiction. 3. To assess and compare the knowledge levels among participants (post-test) for both groups (study and control). 4. To find the association between studies group post-test levels of knowledge with participants socio-demographic variables.

Materials and methods: The present study carried out by using quasi-experimental design with two groups and over three assessment phases, in period from September 2019 to July 2021, with objective of assessing educational program effectiveness in improving knowledge of drug addiction among students at high-school in Al Najaf city. Total of 70 high-school students divided into two groups, which were included by non-probability purposive sampling methods.

Results: After conducting program the (post-tests) revealed significant improvement in knowledge of students from study group in comparing to control group, which remained at same level of knowledge toward drug addiction with mild decline.

Conclusions: Furthermore, the study concluded that the education program was effective in enhancing knowledge of students concerning drug addiction. Besides, it is beneficial to conduct such programs in order to protect students from addiction risk. The study recommended for further modification and application of current program in future besides the need to educate teachers and as well as families toward drug addiction issue.

KEY WORDS: drug addiction, knowledge, high school students

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INTRODUCTION

Drug addiction and substance abuse are among most preventable and treatable health problems during adolescence period if proper health programs are available. The World Health Organization estimated that about 275 million individuals have used an illicit drug at least for once [1-2]. According to the World Health Organization, the global burden of disease attributable to alcohol and illicit drug use is 5.4% of the total burden of disease [3]. Substance addiction is a complex mental disorder characterized by compulsive drug use despite efforts to abstain and the negative consequences it has on the individual and their environment [4-5]. Addiction can be defined as the loss of control over drug use. Drug addiction is a neuropsychiatric disorder characterized by a recurring desire to continue taking the drug despite harmful consequences [6]food addiction, internet addiction, and mobile phone addiction. Their definition is similar to drug addiction but they differ from each other in specific domains. This review aims to provide a brief overview of past and current definitions of substance and non-substance addiction, and also touches on the topic of diagnosing drug addiction and non-drug addiction, ultimately aiming to further the understanding of the key concepts needed for a foundation to study the biological and psychological underpinnings of addiction disorders [6]. Adolescence is the transition period from childhood to adulthood, involving rapid developments in humans' biology, psychology, and social life [7]. High school students are at the peak of adolescence period. Regarding drug and substance abuse, adolescence is a critical period of life and considered risky period. Where the risk of addiction reaches the highest levels and this period is characterized by the ability of the teenager to adopt behaviors that threat him psychologically, physically and socially [8–10]52.90 percent were girls and 47.10 percent boys. The age ranged from 11 to 19 years, and the majority lived in school hostels (82 percent. Unfortunately, according to world health organization latest statistics on drug addiction among Arab countries including Iraq, few valid data for this health problem found [11]. Addiction control is a worldwide concern, according to world health organization (WHO) adolescent aged 15 to 19 are at the center of focus for effective interventional programs on individual and community levels [12].

THE AIM

1. To assess the existing knowledge of high-school students regarding drug addiction.
2. To measure the effectiveness of planned teaching pro-

gram upon study groups knowledge on drug addiction.
3. To assess and compare the knowledge levels among participants (post-test) for both groups (study and control).
4. To find the association between studies group post-test levels of knowledge with participants socio-demographic variables.

MATERIALS AND METHODS

A quantitative, quasi-experimental design of control and study group with repeated measure (three tests: pre, post I, and post II) was applied. The study was carried out over the period of time that started since 23rdof September 2019 and ended on 14th of August 2021.A purposive sample of 70 high school students of 10 schools (governmental and private) from Al-Najaf Al-Ashraf City were included in the study and they were assigned to control and study group through non-random methods (35 students for study and 35 for control group). Data collection was done through the period from 15th October 2020 to 30th November 2020, the program due to Covid-19 pandemic done online on Zoom platform. Study instruments consist of two parts, first part is Sociodemographic characteristics and the second part is about knowledge of drug addiction which involves31 questions of five sub-domains. Chi-squared test and Repeated measures of ANOVA was done in statistical analysis for both study and control groups. Rating and scoring for knowledge about drug addiction applied as following: Each item of the knowledge questions had four choices, therefore, according to the ideal answers for each question, the responses of participants categorized either, correct (for one choice, incorrect for rest of tree choices). The scores were two points for accurate answer and one point for incorrect answers, the evaluation of the knowledge then categorized into three categories; good, fair or poor according to the value of the mean score (Table I)

RESULTS

According to results 70 high school students who were included in the study, and divided equally into control and study group (35 students at each group), and the mean age was 18.3±1.19, 17.7±1.06 for study and control group, respectively. Regarding the gender 33 students were male (16 for study and 17 for control group), and 37 were female (19 for study and 18 for control group). More than 92% of students who participated in the study were urban residents, while only 5 participants were rural residents. Concerning the stage of students, more than 60% of students were from 12th stage

Table II shows knowledge responses of both control and study group of high school students in (Pre-test) regarding the seven domains of knowledge, overall knowledge and attitudes toward drug addiction, where the knowledge measured in light of three categories (poor, fair and good), and the attitude in two categories (positive and negative).

According to Table III the responses of study group in Post-Test I for knowledge domains were good for all domains except knowledge of physical effects of addiction was fair with M.S. (1.63). Whereas, the students' responses of control group in Post-Test I were fair assessment for all knowledge domains but social & economic effects domain showed good assessment with MS (1.83)

Table IV reveals that the responses of study group in Post-Test II for knowledge domains were good for all domains. While, the responses of control group in Post-Test II were fair assessment for all knowledge domains but social & economic effects domain showed good assessment with M.S. (1.80).

Table V demonstrates that the main time effect is significant, between group effects also is significant and group interaction overtime is significant at (p-value ≤ 0.05). According to figure 1. the line of control and study group were changing over time differently and are not parallel which indicates significant interaction.

Table VI reveals multiple comparisons of post-hoc test (Bonferroni test), between three phases, which there is a statistical difference (significance 0.000) between Pre-Test and Post-Test I, as well as Pre-Test with Post-Test II. While, the Post-test II was statistically not significant with Post-test I (p-value = 0.173). Thus, the total knowledge of students revealed highly significant changes between first and second phase and between first and third phase (p-value ≤ 0.05), and non-significant (p-value > 0.05) difference between second and last phase in their total knowledge regarding drug addiction.

DISCUSSION

In pretest, the responses of study and control group to the first domain which includes concepts of drug addiction and substance abuse was fair 28%, 68% with mean score 1.39, 1.41, respectively. Correspondingly, the second, third and fourth domains (general information on drug addiction, physical and psychological effects of substance abuse) had fair assessment for both study and control groups. The domain of social and economic effects of addiction on drugs revealed different assessment by control and study group in which the study group had fair knowledge 62% with mean score of 1.62 and the control group showed good assessment 89% concerning this domain with mean of score 1.83. The overall knowledge of study and control group of high school students exposed fair assessment 57%, 74% with means of scores 1.46, 1.54 correspondingly for study and control group. This pretest is consistent with Yadav and Parajuli 2021 who conducted a research on students' knowledge about drug addiction in Nepal, and agreed with current results for domain of physical effects which 55% of participant had fair information and disagreed in light of psychological effects which reported that 77% of students had good knowledge, however, concerning social and economic effects the students of showed poor knowledge [13]. Furthermore, Nebhinani and others disagreed with present study and reported high knowledge

level in assessment study among high school students regarding drug addiction and abuse for domains of general information, its physical impacts on health and social effects of addiction [14]. Furthermore, in the second phase of study 1st Post-test, (Table III) the control group remained fair knowledge toward drug addiction with a slight increase in mean of knowledge 1.59 with percent of 48% and 37% for fair and good knowledge, respectively; due to limit increase of correct responses for control post-1 compared to pre which was 20% in first assessment and become 37% in second test. This might relate to reading on this topic after 1st test but the increase was not significant and control group remained with fair knowledge. But the study group knowledge had high change in knowledge after performing program sessions, which the knowledge become good with mean of 1.78 and good responses among high school students of this group was 77% indicating that program increase the knowledge levels. Moreover, table IV the third phase of program 2nd Post-test, revealed that study group knowledge remained good (85%) with slight increase of mean (1.85), but the control group knowledge was steady at fair 82% assessment with decreasing in the mean of knowledge 1.48, leading to fact that despite of minor changes in control group mean but their knowledge totally not changed, where the opposite to study group occurred. Anju and Rajamani in 2019 conducted an education program and found steady results with contemporary study, in which the total knowledge of adolescent pupils was moderate for control and study groups (80%, and 83%), respectively. And after conducting program the control group information remained fair (86%) with slight increase same as current findings and the experiment group knowledge increased to good level (83%) [15]. Other studies conducted only one group approach in research (only study or experiment group). For instance, Naseemullah et al. used study group over two test and their results found that student of high schools included in study had moderate knowledge (nearby 54%) and good knowledge in posttest (76%), which is consistent to compare with current work where study group showed (54%) fair knowledge in pre assessment and (80%) good in post-exam results[16]. Correspondingly, Naseemullah et al. also reported that students' knowledge for domains like concepts of drug misuse was (61%) poor and increased to (69%) good in post results, while present work showed that students from group of study had fair knowledge and become good after program (94%) [16]. Naseemullah et

Table I. Categrozation of the evaluation of the knowledge.

Mean of score	Evaluation
M.S. ≤ 1.33, means	Poor
M.S. (1.34-1.67) means	Fair
M.S. ≥ 1.68 means	Good

Table II. Spreading of the students' groups (study and control) in Pre-test according to their 1-5 Knowledge domains, total knowledge.

Freq.		Study Pre			Control Pre			
		[%]	M.S	Assess	Freq.	[%]	M.S	Assess	
Concepts of Addiction & Substance Abuse	Poor	13	37.14	1.39	Fair	6	17.14	1.41	Fair
	Fair	10	28.57			24	68.57		
	Good	12	34.29			5	14.29		
General Information	Poor	10	28.57	1.48	Fair	6	17.14	1.49	Fair
	Fair	18	51.43			23	65.71		
	Good	7	20.00			6	17.14		
Physical effects	Poor	15	42.86	1.37	Fair	15	42.86	1.40	Fair
	Fair	17	48.57			16	45.71		
	Good	3	8.57			4	11.43		
Psychological effects	Poor	7	20.00	1.46	Fair	2	5.71	1.57	Fair
	Fair	19	54.29			18	51.43		
	Good	9	25.71			15	42.86		
Social & Economic Effects	Poor	8	22.86	1.62	Fair	2	5.71	1.83	Good
	Fair	5	14.29			2	5.71		
	Good	22	62.86			31	88.57		
Total Knowledge	Poor	10	28.57	1.46	Fair	3	8.57	1.54	Fair
	Fair	20	57.14			26	74.28		
	Good	5	14.29			6	17.14		

Knowledge abbreviations:
M.S. ≤ 1.33, means "poor",
M.S. (1.34-1.67) means "fair"
M.S. ≥ 1.68 means "good".

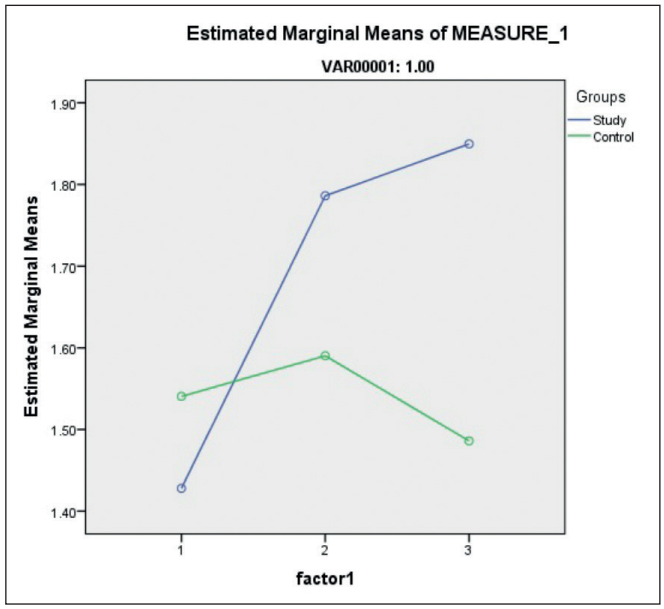

Fig. 1. Plot Changes in the levels of Overall Knowledge in the control group and study group throughout the Pre-test, Post-test 1 and Post-test 2.

al. findings concerning physical effects of addiction was 63% poor in pre and become 72% good after study, this is comparable to present study which 48% of high school students had fair knowledge and increased to good (54%). For treatment and prevention current study revealed that study group had 60% between fair and poor knowledge and turned to 89% good this is also similar to what expressed by Naseemullah et al. in 2019, where 42% of students showed good knowledge in pre-phase while it became 75% good after the second test [16]. Another researchers, Kaur et al. in 2018 applied teaching program with only experiment group on student adolescents knowledge and attitude toward drug abuse, and their findings showed that total knowledge of student was 60% moderate and 40% poor in initial test and improved to 76% moderate and 24% good knowledge in 2nd examination , while the attitudes was 73% positive in pre and improved to 100% positive in second test, this findings are strongly associated and similar to existing results where after program also the study groups showed good knowledge assessment for 80% with no poor knowledge and thus the attitudes turned to 100% positive in the first post-exam [17]. According to outcomes of ANOVA repeated measure, revealed that a significant difference among overall level of knowledge of the study group occurred tables (V-VI), and figure 1 at three phases of examination (1st, 2nd and 3rd test) which (F=169, and p-value 0.001) whereas directs to fact that study group revealed good knowledge in the second and third test compared to pre-program test. And according to effect size of Cohen's and observed power ranking the program had almost acceptable effectiveness (d=0.328) on

Table III. Distribution of the control and study groups sample regarding to their 1-5 Knowledge domains, total knowledge in Post I.

Freq.		Study Post I			Control Post I			
		[%]	M.S	Assess.	Freq.	[%]	M.S	Assess
Concepts of Addiction & Substance Abuse	Poor	0	.00	1.87	Good	4	11.43	1.51	Fair
	Fair	2	5.71			21	60.00		
	Good	33	94.29			10	28.57		
General Information	Poor	1	2.86	1.75	Good	4	11.43	1.58	Fair
	Fair	13	37.14			18	51.43		
	Good	21	60.00			13	37.14		
Physical effects	Poor	8	22.86	1.63	Fair	12	34.29	1.46	Fair
	Fair	8	22.86			17	48.57		
	Good	19	54.29			6	17.14		
Psychological effects	Poor	0	.00	1.86	Good	2	5.71	1.57	Fair
	Fair	3	8.57			18	51.43		
	Good	32	91.43			15	42.86		
Social & Economic Effects	Poor	1	2.86	1.82	Good	2	5.71	1.83	Good
	Fair	4	11.43			2	5.71		
	Good	30	85.71			31	88.57		
Total Knowledge	Poor	1	2.85	1.78	Good	5	14.28	1.59	Fair
	Fair	7	20.00			17	48.57		
	Good	27	77.14			13	37.14		

Knowledge Abbreviation:
M.S. ≤ 1.33,means "poor",
M.S. (1.34-1.67) means "fair"
M.S. ≥ 1.68 means "good"

Table IV. Distribution of the study sample responses in Post II concerning to 1-5 Knowledge domains, total knowledge.

Freq.		Study Post II			Control Post II			
		[%]	M.S	Assess	Freq.	[%]	M.S	Assess
Concepts of Addiction & Substance Abuse	Poor	0	.00	1.86	Good	9	25.71	1.38 Fair
	Fair	2	5.71			21	60.00	
	Good	33	94.29			5	14.29	
General Information	Poor	0	.00	1.84	Good	7	20.00	1.47 Fair
	Fair	5	14.29			25	71.43	
	Good	30	85.71			3	8.57	
Physical effects	Poor	0	.00	1.77	Good	19	54.29	1.32 Poor
	Fair	14	40.00			14	40.00	
	Good	21	60.00			2	5.71	
Psychological effects	Poor	0	.00	1.88	Good	5	14.29	1.47 Fair
	Fair	1	2.86			22	62.86	
	Good	34	97.14			8	22.86	
Social & Economic Effects	Poor	0	.00	1.90	Good	1	2.86	1.80 Good
	Fair	1	2.86			3	8.57	
	Good	34	97.14			31	88.57	
Total Knowledge	Poor	2	5.71	1.85	Good	1	2.86	1.48 Fair
	Fair	3	8.57			29	82.85	
	Good	30	85.71			5	14.28	

Knowledge Abbreviation:
M.S. ≤ 1.33, means "poor",
M.S. (1.34-1.67) means "fair",
M.S. ≥ 1.68 means "good"

Table V. Repeated Measures ANOVA Tests for Overall Knowledge of participants regarding drug addiction.

Knowledge	Repeated Measures ANOVA Tests			
	F	p	Size effect (d)	Observed power
Main time effect	169.8	0.001	0.328	1.00
Between groups effect	36.96	0.001	0.096	1.00
Groups Interaction overtime	324.306	0.001	0.482	1.00

Table VI. The Differences in the high school students' overall knowledge regarding drug addiction for study & control group over the three tests.

(I) factor 1	(J) factor 1	Mean difference (I-J)	Std. Error	Bonferroni Sigb	95% Confidence interval for differenceb	
					Lower Bound	Upper Bound
1 (Pre)	2 (Post I)	-.204-	.013	.000	-.234-	-.174-
	3 (Post II)	-.184-	.013	.000	-.215-	-.152-
2 (Post I)	1 (Pre)	.204	.013	.000	.174	.234
	3 (Post II)	.020	.011	.173	-.005-	.046
3 (Post II)	1 (Pre)	.184	.013	.000	.152	.215
	2 (Post I)	-.020-	.011	.173	-.046-	.005

high school students' knowledge levels in study group besides that the observed power of intended exam to measure the effectiveness of program was powerful (1.00) [18]. This leads to that program was effective but in informing participants toward drug addiction and needs more development and application on larger group at different circumstance to get larger effect. This might be due to online application of program during Covid-19 pandemic. Likewise, Iranian study of drug abuse prevention program conducted by Ghojavand and Ramesh in 2014 containing study and control group over two test (before-after program sessions) supported current finding regarding post pro-

gram enhancement at p. value 0.00 for both knowledge and attitudes [19]. In fact, few studies used 3 phase educational program with two groups (study and control) toward drug addiction knowledge, while most programs satisfied with a study group with two stages of testing using paired t-test to measure their program effectiveness. For instance, Theou and others in 2015 found significant knowledge improvement on post exam (p-value < 0.001), indicating effectiveness for program in increasing students knowledge and attitudes[20]gender, monthly income of parents, and education of parents, birth order and history of substance abuse in the family. Method: A Pre-test post-test design was used. Fifty three students from Udupi district was selected by convenient sampling. The tool used was knowledge questionnaire on substance abuse and its consequences. Demographic proforma was used to collect the background information. SPSS software version 16 was used for data analysis. Results: Pre-test knowledge shows that 91% of the students had average knowledge and about 2% of the students had poor knowledge whereas only 7% had good knowledge. The post-test result shows that 28 (52.8%). Gurung and others in 2020 applied an educational program on school adolescence and used paired t-test for one study group of two-phase exam to improve knowledge regarding substance abuse and expressed significant knowledge enhancement at p-value 0.00 [21] illicit drugs, or substances such as over-thecounter medicines, medicines from unsupervised ordinary retail purchase, or even through prescription. It causes significant health problems and functional impairments such as disability and failure to meet responsibilities at work, school, or home. Common substance use disorders are use of alcohol, tobacco, cannabis (marijuana). Other, researcher, like Hansadah and Sonalika in 2018 also insured current study fact that educational program will increase students' knowledge on substance abuse which found that their study is effective at p. value 0.001 [22]. The researcher Prema in 2018 also agreed to this results where the program was highly effective at high significant p-value <0.0001. Not many researchers have been found to prove the failure of educational programs in increasing knowledge and improving students' attitudes towards drug addiction and abuse [23]. On the contrary, many researchers have shown improvement in knowledge and attitudes, ranging from medium to high effectiveness. For example, Naseemullah et al., (2019) find noteworthy increasing in knowledge (p= 0.00), while another consistent findings by Anju and Rajamani in 2019 showed high significant knowledge improvement which p-value was < 0.0001 according to t-test [15-16]

CONCLUSIONS

The program was effective in improving high-school students' knowledge regarding substance addiction, and there was a significant difference (in knowledge) between students who attended the program sessions (study group) comparing to those who not attended program sessions (control group). The study recommended for the adoption of the current program with further modifications and subsequent studies on it, according to what suits the circumstances and needs of students at the high school stage and applying it in future for students by direct attendance when the current pandemic conditions end, also, conducting mandatory training courses on substance misuse or addiction, not for students, but for teachers as well, in order to prepare teachers to perform the role of direct education for their students, in other words, training of trainers or educating the educators. The recommendation included suggesting for including substance abuse health effects, in the curriculum of adolescent school students.

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