

How Legal Drugs Affect the Society? Empirical Evidence from Thailand

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ABSTRACT

Drugs are defined as a medicine, which adversely affect the physical and mental health of individuals. Nowadays, people can easily get addicted of drugs. Legal drugs, including alcohol, nicotine, caffeine, and smoking are commonly used drugs among individuals, which postpones the nervousness, anxiety and social stress from the individuals by providing them a temporary satisfaction. But the extensive use of these drugs has adverse effects on society. Therefore, the purpose of the study is to investigate the impact of legal drugs i.e., alcohol, smoking, nicotine, and caffeine on the society. For this purpose, the study gathered the data from 235 respondents through an online survey method. The study applied measurement model for testing the reliability and validity of data. Study used structural equational modeling (SEM) for the empirical estimation of results. Significance of the path coefficients are tested

through bootstrapping. Results of the study shows the negative impact of alcohol, smoking, nicotine, and caffeine on the society. The study suggests that government should introduce the health literacy programs for the awareness of adverse effects of legal drugs.

Keywords: Alcohol; Caffeine; Nicotine; Smoking; Society; Thailand.

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INTRODUCTION

Drugs are defined as a medicine, which adversely affect the physical and mental health of individuals. Nowadays, people can easily get addicted of drugs [1]. Legal drugs, including alcohol, nicotine, caffeine, and smoking are commonly used drugs among individuals, which postpones the nervousness, anxiety and social stress from the individuals by providing them a temporary satisfaction. But the extensive use of these drugs has adverse effects on society because the consumption of these drugs leads many socio-economic and health problems, including lung diseases, sickness, increase in crime rates and so on. [10]. Therefore, present study aims to investigate the impact of smoking, alcohol, nicotine and caffeine on society.

Smoking is commonly used drug among adults and old citizens. It adversely effects the health of individuals by

increasing the ratio of respiratory diseases. According to Aykurt et al. [1], 47% of asthma patients in Japan are smokers. Moreover, approximately 480,000 impulsive deaths of individuals in US (278,544 deaths among men and 201,773 deaths among female), shown in figure 1 are the reason of tobacco smoking [7]. Though tobacco is a legal drug, but its effects are more adverse as compare to illegal drugs like marijuana, cocaine and LSD [8]. The use of tobacco kills almost five million people annually, including 20% death rate of men and 5% death rate of female. Moreover, approximately 10 million death rates will be increased globally by 2030 on the current consumption pattern of smoking [7]. Moreover, smoking doesn't only affect the health of smoker but it also has adverse effects on the social circle of smokers [2].



FIGURE 1: Death Rate in US due to legal drugs

Alcohol is another commonly used legal drug which is extensively used among all civilization since ages. It is a sedative which generally affect the CNS. Excessive use of alcohol causes a progressive loss of reserves, faintness, loss

of synchronization. It also leads blurred visualization, garbled speech, vomiting and mood swing. Moreover, continuous use of alcohol causes high blood pressure, lever infections and cancer. According to Jha [7], every year

88,000 deaths in US are the reason of excessive consumption of alcohol. The direct or indirect reasons of the death are drunk driving, cancer, mood swings and whacks (shown in Figure-1).

Nicotine is also commonly used drug among adults. It is a main intergradient of cigarettes which engage an individual towards tobacco addiction. It is a monochrome liquid which can be easily found in all tobacco products, including cigarettes, chewing tobacco and pipe tabaco. The addiction of nicotine is very difficult to quite. Its addiction also leads many chronic disorders like TB, Asthma and various respiratory diseases.

Caffeine is another legal drugs, which is excessively used by children, adults and old age citizens in the form of tea, coffee and cold drinks which affects the mood and mental behavior of individuals. Sometimes, caffeine could be beneficial for some people, like some people prefer high-intensity exercises, for which the low to moderate amount of caffeine might be beneficial but the excess or the routine use of caffeine may adversely affect the health of individuals. Nowadays, the problem of migraine in adults is very common. Caffeine is one of the main reason of the migraine. According to Hering-Hanit & Gadoth [6], Most of the individuals consume caffeine in the form of tea, coffee or cold drinks which in their turn leads many health problems to the individuals, including severe headache or migraine.

Triangulating the discussion from above it is concluded that all the legal drugs are having significant effects on society which is not empirically investigated yet. Therefore, present study aims to investigate the empirical contributions of legal drugs (i.e., alcohol, smoking, caffeine, and nicotine) on society in the case of Thailand.

Remaining study having following structure, section 2 presents the review of existing literature, section 3 is about data and methodology, section 4 presents data and methodology while section 5 is about the conclusions and policy recommendations of the study.

LITERATURE REVIEW

Moss [15] indicated Alcohol as a commonly used drug among the adults of US. The study proposed the negative effects of Alcohol on the society as it increases the risk of accidents and damages. Moreover, alcoholic people suffers from various psychological and medical problems. Moreover, the wellbeing of people is also adversely affected by the Alcohol. Ono et al [18] indicated the increasing trend of cancer in alcoholic people. The study proposed that the risk of chances alcoholic linked cancer is high in males and the risk of cancer will be increase with the increased consumption of alcohol. Okan et al. [17] examined the influence of health literacy on the usage of alcohol. The study concluded that health literacy tends to reduce the consumption of alcohol. In other words, health literacy makes the people conscious regarding their health. So, in their turn, people reduce the consumption of alcohol as it is having adverse influences on human health. Testino et al. [24] indicated the adverse effects of alcohol usage on society. The study prosed that increase in the usage of alcohol tends to increase the risk of liver diseases among individuals. The study showed that almost 30-35% liver patients in japan are

alcoholic individuals. Osonuga et al. [19] identified the reasons of alcoholic abuse and the reason behind the increased usage of alcohol. For this purpose, the study conducted cross-sectional study by utilizing the data from 384 students. The study showed that almost 66% students are alcohol addicted by hanging out with friends, 20% students used alcohol as a remedy of stress, 12% student used alcohol for fun. Teka [23] examined the socio-economic impact of the alcoholic usage on the adults of haramaya town, Ethiopia. For this purpose, the study conducted the cross sectional survey by using mix method data collection. Data were collected from 120 respondents, including married respondents, illiterate respondents, and unemployed respondents. Results of the study depicted that the consumption of alcohol leads to different social problems such as lack of integration with people, different economic problems such as poverty and shortage of resources and various health problems such as headache, vomiting and different liver problems.

H₁: "There are negative effects of alcohol on society"

Leite et al. [9] proposed that smoking is having adverse effects on society. Particularly, the ratio of severe diseases such as asthma, TB and lungs problems are high in smokers. Gallus et al. [4] investigated the impact of smoking on lungs diseases by conducting qualitative research. The study concluded that the ratio of lungs diseases is high in the smokers. Münzel, Hahad & Daiber [16] examined the influence of smoking on cardiovascular risk and revealed the positive affiliation between these variables. The study concluded that the risk of vascular damage is positively associated with the ratio of smoking. The higher the ratio of smoking, the higher will be the risk of vascular damage. Aykurt et al. [1] investigated the affiliation between smoking and respiratory problems. The study showed that the higher the ratio of smoking, the higher the respiratory problems. Study further showed that 45% patients of asthma in Japan are smokers. Li et al. [11] investigated the impact of smoking on the overall health of older Chinese. For this purpose, the study conducted cross-sectional study and baseline data were collected from 1492 Chinese American mans who were participated in PINE. The study showed that the health of the old Chinese mans were adversely affected by the smoking. Particularly, 74% smokers were suffering in thyroid disease, 23% smokers were facing severe anxiety, 67% smokers were facing the problem of asthma. Chau et al. [2] investigated the influence of smoking on individual's social circle. The study revealed that the social circle of smokers is small. Nobody wants to be close with smokers because the smoke of tobacco irritated people. Choi, Dave & Sabia [3] examined the effects of medical marijuana laws (MMLs) on the consumption of tobacco cigarette. For this purpose, the study utilized the data from NSDUH. The findings of the study revealed that there is negative relationship between MMLs and consumption of cigarette. Particularly, 1.5% reduction in the consumption of tobacco cigarette is due to the imposition of MMLs. Shrem et al. [22] examined the contributions of smoking on eyes problems and revealed that 8.9% eye problems are the reason of the smoke of Tabaco.

H₂: "There are negative effects of smoking on society"

Goldstein et al. [5] proposed that the consumption of caffeine tends to increase the sports performance of individuals. Moreover, it is beneficial for high-intensity exercises. The study concluded that the consumption of caffeine should be low to moderate because a high level of caffeine consumption may adversely affect the health of individuals. Hering-Hanit & Gadoth [6] revealed that mostly the individuals consume caffeine in the form of tea, coffee or cold drinks which in their turn leads many health problems to the individuals, including severe headache or migraine. Roehrs & Roth [20] revealed the adverse effects of caffeine consumption on human health by visiting the headache clinic of general hospital. Author found that during the last 5 years 24% patients are those who consume caffeine in the form of cola drinks. Mort & Kruse [14] examined the impact of caffeine consumption on blood-pressure. Study revealed that BP is significantly affected by the caffeine consumption. Particularly, caffeine tends to increase BP through the inhibition of adenosine receptor. The study concluded that caffeine level reaches to its peak after the 25-240 minutes of its oral consumption. Uddin et al. [25] investigated the impact of caffeine on the sleeping quality of individual. The study proposed that the sleeping quality of regular caffeine's in-takers are not good.

H3: "There are significant effects of caffeine, amphetamine on society"

Lopez et al. [12] explored the adverse effects of nicotine consumption on human health. The study found that the ratio of nicotine consumption is high on the smokers because nicotine is the main intergradient of cigarettes and people become addicted of nicotine which adversely affect the health of individuals in the form of severe headache, nausea, vomiting or migraine. Salman et al. [21] examined the influence of nicotine on lungs diseases and revealed that the increasing ratio of lungs diseases are directly associated with the consumption of nicotine. The higher the consumption of nicotine, the higher the ratio of lungs diseases.

H4: "There are negative effects of nicotine consumption on society"

METHODOLOGY

Sample and Data Collection

The study uses multiple-choice questions to analyze the respondent's profile. The data are collected through an online survey method. The URL of questionnaire was shared to different Social websites such as Facebook, WhatsApp and Instagram. Some parts of the survey followed the pattern of 5 type Likert scale, containing 5 responses i.e., strongly disagree=5 to strongly agree=1; while other parts followed the pattern of nominal scale, containing 2 responses i.e., 1=yes; 2=No. Questionnaire was divided into two parts, first part consisting on demographic profiles of respondents, including information regarding their gender, age, and qualification. While second part containing items related to module variables. Almost 235 participants filled the online questionnaire. Data of the respondents are used to accomplish follow-up analysis.

Description of Variables

Alcohol (AL)

AL is used as an independent variable of the study. It is commonly used drug among the adults which is highly associated with the enlarged risk of damages and accidents. The study used consumption of alcohol as a measurement of alcohol.

Smoking (SM)

SM is also an independent variable of the study. Nowadays, smoking is very common among individuals. Generally, smokers suffer in various infections like thyroid infection, lungs infection, asthma and so on. The study used consumption of Tabaco cigarettes as a measurement of smoking.

Caffeine, amphetamine (CAA)

CAA is another independent variable of the study. Basically, caffeine in drinks with the overtone of amphetamine-related drugs is very demanding among young adults which leads to hyperthermia, seizures and severe toxicity. Study used consumption of caffeine as a measure of CAA.

Nicotine (NI)

NI is also used as an independent variable of the study. It is the vigorous intergradient in tobacco products, which makes an individual of tobacco addicted. Study used nicotine consumption as a measurement of nicotine.

Society (SOC)

SOC is the dependent variable of the study. It is defined as a group of people who are involved in persistent communal interface. Study used well-being of individual as a proxy of society.

Methods

Present study used structural equation modeling (SEM) for analyzing the data. It is new technique, having extensive use as it has a capability to establish multipurpose regression and correlation on a single model. It is providing more accurate results as compare to OLS [21]. It reduced the residual errors from the independent latent variables and lessen the estimator's preference. SEM comprising on 2 models, measurement model and structural model. Measurement model is used to check the reliability and validity of data. Testing of this model is very essential because if data are not valid or reliable then author cannot proceed for further estimations. Structural model is used to test the significance of the variables.

Model Specification

Present study used following econometric model for the empirical estimation of the results.

$$SOC = \beta_0 + \beta_1(AL) + \beta_2(SM) + \beta_3(CAA) + \beta_4(NI) + \mu$$

Where; "AL is Alcohol, SM is smoking and CA is Caffeine, amphetamine; β_0 , β_1 , β_2 , β_3 , β_4 are coefficients, while μ is error term/residuals."

EMPIRICAL ANALYSIS

This section presents the empirical estimation of moduled variables.

Discriptive Statistics

Table 1 shows the results of discriptive statistics, comprising on mean, median, standard deviation, minimum and

maximum values of items. Outputs indicate that the study is based on a survey of 27 items, responses of 6 items varies from zero to one, responses of 2 items varies from one to four, and the responses of 19 items varies from one to five. Mean score of different items ranges from 0.365-4.403 and the value of standard deviation ranges from ± 0.065 to ± 1.249 .

TABLE 1: Discriptive Statistics

Indicators	Mean	Min	Max	Standard Deviation
AL2	3.311	1	5	1.249
AL3	3.311	1	5	1.249
AL4	0.532	0	1	0.065
AL5	3.063	1	5	1.237
AL6	3.189	1	5	1.116
SM1	0.652	0	1	0.085
SM2	3.042	1	5	1.111
SM3	0.387	0	1	0.076
SM4	3.412	1	5	1.040
SM5	3.458	1	5	1.039
CAA1	0.365	0	1	0.067
CAA2	3.870	2	5	1.019
CAA3	3.450	1	5	1.002
CAA4	3.525	1	5	0.990
CAA5	3.525	1	5	0.990
CAA6	3.408	1	5	0.969
NI1	0.476	0	1	0.075
NI2	3.513	1	5	0.951
NI3	3.513	1	5	0.934
NI4	3.370	1	5	0.906
NI5	2.634	1	5	0.906
SOC1	2.067	1	4	0.872
SOC2	2.815	1	4	0.864
SOC3	4.403	2	5	0.863
SOC4	4.403	2	5	0.863
SOC5	3.399	0	1	0.089

Measurement Model

Figure 2 shows the measurement model of the study, comprising on four latent variables i.e., Alcohol, caffeine, nicotine, smoking and society. This model is consisting on confirmatory factor analysis which tells the author about the

reliability and validity of different items and constructs. Measurement model is essential for conducting the primary research because author cannot proceed for further analysis if the data are not reliable and valid.

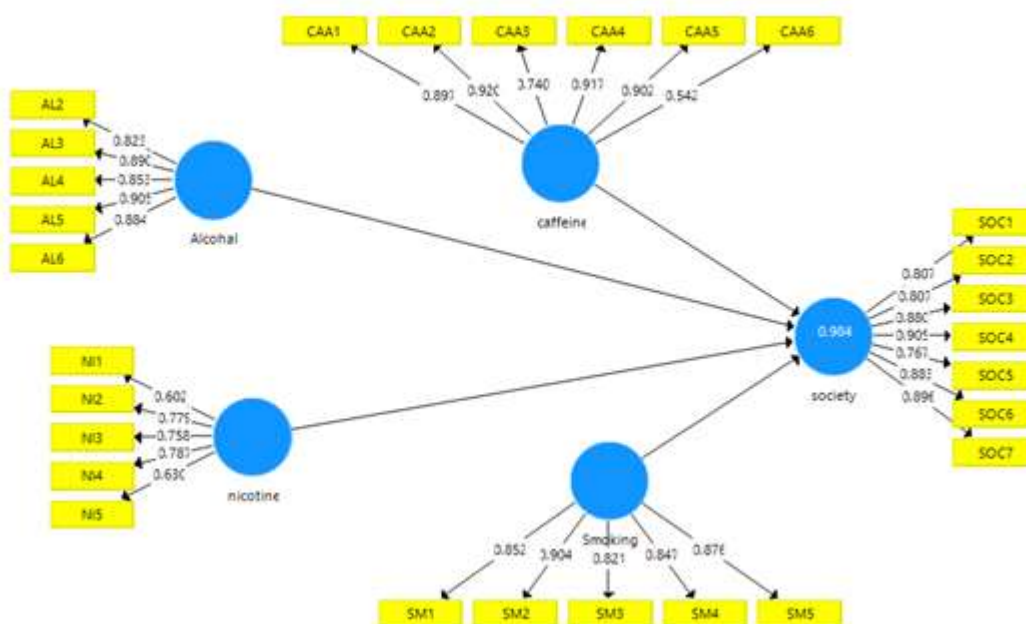


FIGURE 2: Measurement Model

Confirmatory Factor Analysis (CFA)

In primary research, there might be possibility that data are not reliable or valid for further analysis. So, testing the reliability and validity of different items and construct are essential. CFA is used for testing the reliability and of data that are obtained through measurement model. Results of CFA are depicted in Table 2.

Loading values, shown in Table 2 shows the convergent validity of each item. According to [20], loading value of an item must exceed 0.4. if the value is less than 0.4 then convergent validity is not present in items and author should exclude that item from the construct for making the data reliable. In present case, the loading value of A11 was less than 0.4, so we exclude A11 from the model. However, reaming loading values are greater than 0.4. The highest loading value is 0.917 while the lowest loading value is 0.542. So, it is concluded that convergent validity is present in each item of all constructs.

Values of AVE, shown in Table 2 shows the convergent validity of each construct. The value of AVE for each construct must exceed 0.5 [20]. In present case, the value of

AVE for all constructs i.e., AL (AVE= 0.940), SM (AVE=0.934), CAA (AVE=0.929), NI (AVE=0.838), SOC (AVE=0.948) exceeds 0.5. So, it is concluded that convergent validity is present in each construct.

Coefficient of CR, shown in Table 2 shows the construct validity, another type of validity. The value of CR must exceed 0.5 in order to satisfying the condition of construct validity. In present case, the value of CR of each construct (AVE= 0.922), SM (AVE=0.916), CAA (AVE=0.930), NI (AVE=0.776), SOC (AVE=0.940) exceeds 0.5. So it is concluded that construct validity is present.

Cronbach’s alpha (α), shown in table 2 is used for testing the reliability of each construct. According to Hair et al. [20], the value of α must exceeds 0.4 and if the value exceeds from 0.8 then the data of constructs will be highly reliable. In present case, the values of α for all constructs is greater than 0.4 so it is concluded that data are reliable. Particularly, the data of AL ($\alpha = 0.921$), SM ($\alpha = 0.912$), CAA ($\alpha = 0.904$), SOC ($\alpha = 0.936$) are highly reliable as the values are exceeding from 0.8.

TABLE 2: Confirmatory Factor Analysis (CFA)

constructs	Items	loadings	Cronbach’s alpha	CR	AVE	VIF
AL	AL2	0.823	0.921	0.922	0.940	2.311
	AL3	0.890				3.653
	AL4	0.853				2.508
	AL5	0.905				3.997
	AL6	0.884				2.942
SM	SM1	0.852	0.912	0.916	0.934	3.438
	SM2	0.904				4.415
	SM3	0.821				1.923
	SM4	0.847				4.584
	SM5	0.876				3.899

CAA	CAA1	0.897	0.904	0.930	0.929	1.488
	CAA2	0.920				1.237
	CAA3	0.740				1.773
	CAA4	0.917				1.444
	CAA5	0.902				1.835
	CAA6	0.542				1.312
NI	NI1	0.602	0.759	0.776	0.838	2.703
	NI2	0.779				3.599
	NI3	0.758				2.221
	NI4	0.787				2.455
	NI5	0.630				2.833
SOC	SOC1	0.807	0.936	0.940	0.948	2.457
	SOC2	0.807				2.526
	SOC3	0.880				3.424
	SOC4	0.905				4.356
	SOC5	0.767				1.971
	SOC6	0.883				4.424
	SOC7	0.896				4.019

Discriminate Validity

Table 3 shows the results of discriminate validity. In present study, criteria of FLC is used for measuring the discriminate validity. According to this criteria, if the diagonal values (shown in bold) are exceeding from remaining values, then

the discriminate validity is present in data. In present case, diagonal values (0.998, 0.986, 0.983, 0.971, 0.985) are exceeding from remaining values (shown in Table 3). So it is concluded that there is presence of discriminate validity in data

TABLE 3: Discriminate Validity

	Alcohol	Smoking	Caffeine	Nicotine	Society
Alcohol	0.998				
Smoking	0.888	0.986			
Caffeine	0.891	0.860	0.983		
Nicotine	0.766	0.748	0.884	0.971	
Society	0.847	0.895	0.873	0.854	0.985

Structural Model

After getting assured that data are reliable and valid for further analysis, the study used structural model for the empirical estimation of results. Structural model (shown in

Figure 3) is obtained through bootstrapping process which tells the author about the collinearity issues and the significance of the results.

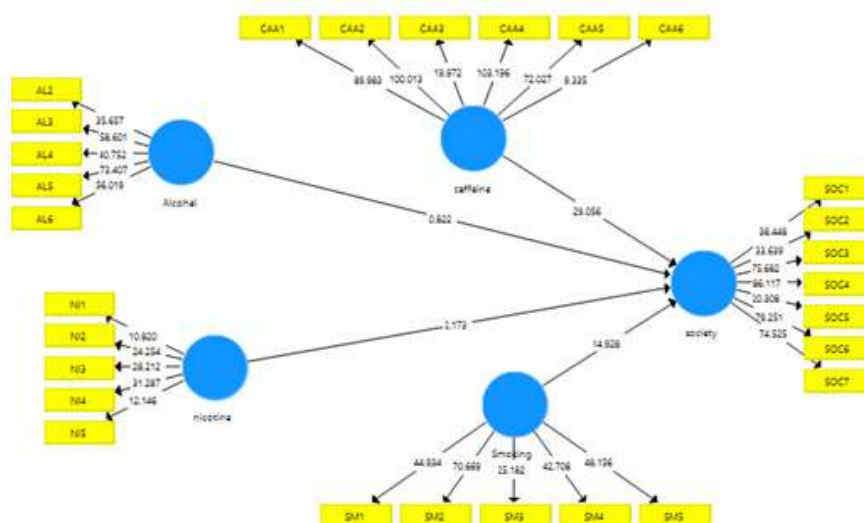


FIGURE 3: Structural Model

Collinearity Issues

Values of VIF, shown in Table 2 are used to test the issue of collinearity among moduled variables. If the value of VIF is less than 5, then there is no issue of collinearity. While, value ranges from 5-10 possesses minor issue of collinearity among variables. Whereas, value exceeds from 10, shows high collinearity issues among variables. In present case, the highest value of VIF is 4.425 while the lowest value is

1.237, as all the values are less than 5, so it is concluded that there is no issue of collinearity among variables.

Path Analysis

Table 4 elaborates the results of path analysis used to test the proposed hypothesis of the study. Significance of path coefficient is tested through the process of bootstrapping.

TABLE 4: Path Analysis

Hypothesis	Coefficients	t-stat.	p-values	Decision
Alcohol → Society	-0.1353	0.822	0.098	Supported
Smoking → Society	-0.3244	14.928	0.000	Supported
Caffeine → Society	-0.0883	29.056	0.000	Supported
Nicotine → Society	-0.1624	2.173	0.030	Supported

Path coefficient of H1 (Alcohol → Society) shows that society is adversely affected by the consumption of alcohol, particularly, 1-unit increase in the consumption of Alcohol tends to reduce the well-being of individual by 0.1353 units. Here, H₁ is supported at 10% level of significance. Path coefficient of H₂ (Smoking → Society) depicts the significant negative influence of smoking on the society. Results show that 1-unit increase in the consumption of Tabaco migrates tends to reduce the well-being of individuals by 0.3244 units. H₂ is also supported at 1% level of significance. Similarly, coefficient of H₃ (Caffeine → Society) also revealed that 1-unit increase in the consumption of caffeine reduces the well being of individuals by 0.0883 units, hypothesis-3 is accepted at 1% level of significance. Finally, study also shows significant negative relationship between nicotine and society at 5% level of significance. The results depict that 1-unit increase in the consumption of nicotine reduces the wellbeing of society by 0.1624 units.

are consistent with existing researchers [15, 17, 24, 16, 20, 12].

Present study has following implications. First, government should impose taxes on the consumption of drugs so that people might reduce their drugs consumption. Secondly, health literacy programs should be introduced by the governments so that people may get aware about the disadvantages of drugs. Third, the supply of drugs should ban for the individuals who are under the age of 18 years. Present study has few limitations: First, the study is conducted in Thailand, future researchers can conduct the replica of this study in different nations. Secondly, the study used only legal drugs for their empirical estimations on the society, future studies may use both legal and illegal drugs. Third, the study use wellbeing as a measurement of society, future studies might use other measurement of society.

DISCUSSION AND CONCLUSION

Drugs are defined as a medicine, which adversely affect the physical and mental health of individuals. Nowadays, people can easily get addicted of drugs [1]. Legal drugs, including alcohol, nicotine, caffeine, and smoking are commonly used drugs among individuals, which postpones the nervousness, anxiety and social stress from the individuals by providing them a temporary satisfaction. But the extensive use of these drugs are having adverse effects on society because the consumption of these drugs leads many socio-economic and health problems, including lung diseases, sickness, increase in crime rates and so on. [10].

Therefore, present study aims to investigate the impact of smoking, alcohol, nicotine and caffeine on society. For this purpose, study collected the data from 235 participants. Data are collected through an online survey method. Study applied structural equational modeling for the empirical estimation of results. Significance of the results are tested through bootstrapping.

Results of the study revealed negative impact of drugs i.e., smoking, alcohol, nicotine and caffeine on society because the consumption of drugs threatens the health of individuals and they suffer in severe health diseases. Results of the study

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