

# The Impact of Life-style Drugs on Society: An Empirical Evidence from Pattaya, Thailand

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## ABSTRACT

People are extensively using drugs for changing their physical and mental aptitudes. These drugs are called life-style drugs. There is no doubt that the use of life-style drugs, including various nutritional supplements, provides many benefits to the individuals, but the continued use of these medicines makes the persons addicted. It adversely affects the health of individuals. Present study therefore aims to investigate the impact of life-style drugs on society. The study uses different supplements such as Food supplements (FS), Anabolic steroids (AS), Melatonin supplement (MS), Height increasing pills (HP), and Lipase Inhibitor (LI) as a proxy of life-style drugs. The study collected the data from 234 individuals of Pattaya, Thailand through a questionnaire. Study uses smart PLS software for analyzing the empirical results. Firstly, the study checks the

reliability and validity of the data. After that, study uses path analysis for the estimation of proposed hypotheses. Significance of the results are tested through bootstrapping. Results of the study reveal positive impact of FS, while negative impact of AS, MS, HP and LI on Society. The study suggested that life-style drugs should supply only those individuals who are having the prescription from doctor.

**Keywords:** Life Style Drugs, Society, Pattaya, Thailand.

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## INTRODUCTION

Life style drugs are the conventional branch of medicines which are used to treat life style illness i.e., sleeping problems, muscle problems, and so on [1]. These drugs can change the non-health related conditions of people [11]. People are extensively using these drugs for changing their physical and mental aptitudes [17]. There is no doubt that the use of life-style drugs, including various nutritional supplements, provides many benefits to the individuals, but the continued use of these medicines makes the person addicted of it. Moreover, it adversely affects the health of individuals [15]. Therefore, present study aims to examine the impact of lifestyle drugs, including Food supplements, Anabolic Steroids, Melatonin supplements, Height increasing Pills, and Lipase Inhibitor on society.

Food supplements are extensively used by the individuals for their balance diet [4]. It is known as a lifestyle drug, including many nutrition-like vitamins, iron, proteins and so on. These nutrients are beneficial for the health of individuals but the excess of anything is bad. Continued use of food supplements adversely affect the health of individuals [28]. For instance, too much vitamin A causes headache and liver damage. Similarly, excess of iron cause nausea and vomiting.

Anabolic steroids are another life-style drug, used for the growth and strength of muscles [3]. It increases body weight and muscle size. This medicine is commonly used by sportsmen or athletics. Once they start this drug, they become addicted to this. It also results chronic diseases in human body, including kidney problems, increase in sugar level, increase risk of high blood pressure and problems of blood clots etc.

Sleeping problems are very common among individuals, especially for adults. Therefore, people are taking many medicines like, Melatonin supplemented, for regulating their sleeping problems [14]. Although this supplement helps the insomnia patients but it makes the person addictive of it. People are unable to sleep without taking this supplement. Moreover, it effects the mental health of individuals in the form of depression, anxiety and irritation. It also results many digestive problems

Height increasing pills are also another life style drug which are commonly used by individuals, provides temporary satisfaction to the individuals, but having long lasting adverse effects on the individual's well-being. It results joints pain, swelling and high cholesterol levels. Similarly, the use of Lipase Inhibitor also increases by individuals, day by day for losing their weight which also makes the people addicted of it. [23]

There are five phases, involving in the addiction of any drug, including "relief, increased use, preoccupation, dependency, and withdrawal" (shown in Figure 1). Relief phase discusses the satisfaction, faced by the individual by the consumption of that drug, which helps in escape from tension, anger, anxiety or tiredness. The phase of an increased use forces an individual to take more quantity of the drug. Preoccupation phase involves a constant use of the specific drug, and the consumption of the drug becomes the habit of individuals. In the phase on dependency, individual become addicted to the drug and face cravings for the drug and if he does not get the specified amount of the drug, then he will face mood swings including, anger, anxiety, and depression. The phase of withdrawal shows adverse effects on individual's health, including itching, stomach problems, liver problems, intestine problems and cardinal problems [5].

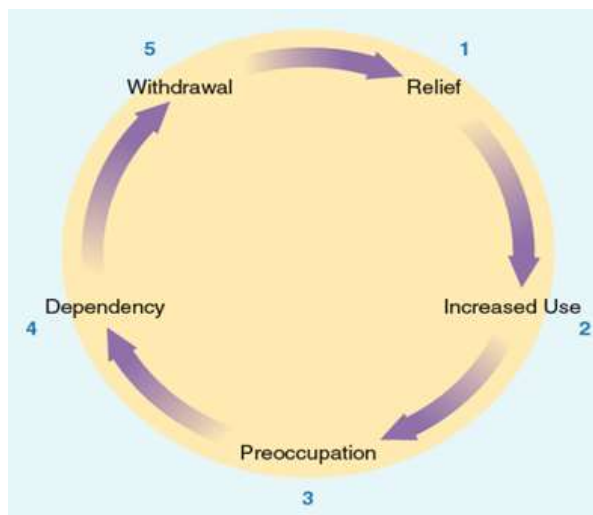


FIGURE 1. Drug Dependence Stages

During 2018, there is increase in the ratio of the consumption of life style drugs, including different supplements (shown in Figure 2). 38% people are taking supplements for health reasons. 35% are taking for balanced diet for health reasons. 35% are taking for balanced diet plan. 34% people are taking for the immune system

stimulation. 17% are taking for cosmetic reason. 16% are taking for weight losing purpose and 15% are taking for regulating their sleeping routine. But these people are not aware that the consumption of these supplements are associated with various side effects.

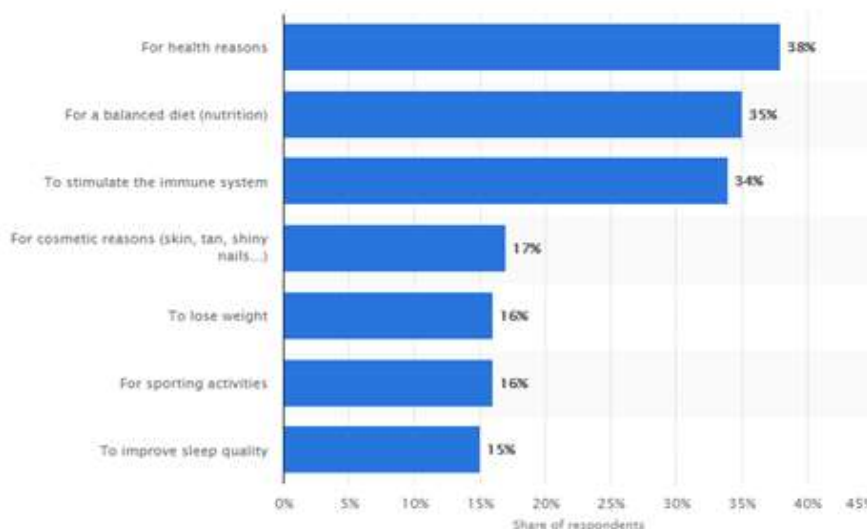


FIGURE 2. Ratio of the Consumption of Life-style Drugs

However, triangulating the discussion from above it is concluded that life style drugs adversely affect the life of individuals, hence having significant relations with society which is not empirically investigated yet. Therefore, present study aims to investigate the impact of Food supplements, Anabolic Steroids, Melatonin supplements, Height increasing Pills, and Lipase Inhibitor on pattaya, Thailand. Remaining study has following structure: section 2 shows the review of existing literature, section 3 is about data, sample and methodology. Section 4 presents empirical results and section 5 is about conclusions, discussions and policy implications.

## LITERATURE REVIEW

This section signifies the review of existing literature and construction of hypotheses.

### Food Supplements and Society

Carvalho et al. [7] done their research on food supplements. The study examined the influence of food supplements on the human health. For this purpose, study collected the data form 234 individuals who are regularly taking food supplements. The study indicated the positive influence of food supplements on human health. Dams et al. [9] done a qualitative work and examined the influence of food supplements on human health. For this purpose, the study selected 68 subjects, including 33 males and 38 females of under the age of 22-35. The study concluded the positive

effects of food supplements of human health. The study also concluded that an excessive amount may adversely effects the health of individuals, i.e., it may create different hormonal problems. Wieseemann [31] investigated the influence of protein shake, use as a food supplement on the human health. The study indicated the positive effects of protein shake on human health while the excessive amount of protein negatively affects the human health. Efremova, Taranova, & Zenina [10] investigated that either the usage of carrot juice instead of water enhances the quality of bread or not. The study revealed that the quality of bread which is made by using the carrot juice is better than the quality of that bread which is made by using simple mineral water. Ford et al., [12] indicated the adverse effects of vitamin and mineral supplements on human health. The study proposed that excessive use of supplements makes the people addicted of it. So, it is proposed that

H<sub>1</sub>: “There is a significant relationship between food supplements on society”.

#### Melatonin Supplement and Society

Carracedo-Rodríguez et al. [6] examined the influence of melatonin supplement on the intraocular pressure (IOP) in normotensive subjects after the two hours of consumption. The study showed that the daily intake of melatonin supplement tends to reduce IOP in normotensive subjects. Zimmerman & Reiter [32] indicated the effect of melatonin supplement on the health of individuals. The study indicated that there are some advantages of this supplement on the patients of sleeplessness but it adversely affects the health of its in-takers. Akbari et al. [2] explored the contributions of melatonin supplement o the blood-pressure of insomnia patients. The results revealed that the regular dose of this supplement tends to reduce the blood pressure of patients, hence having negative effects on the human health. Gao et al. [13] examined the influence of melatonin supplement on the sleeping habits of individuals. The study concluded that this supplement is commonly used by the patients of insomnia which helps in managing their sleeping routine. So, it is proposed that

H<sub>2</sub>: “There is significant relationship between melatonin supplement and society”

#### Anabolic Steroids and Society

Amsterdam, Opperhuizen & Hartgens [30] perceived anabolic steroids as imitated drugs, mostly used by the athletics or body builders. The study proposed that the excessive use of these drugs negatively affects the health of the individuals. The study concluded that these drugs effects the health of the individuals in the form of liver diseases and cordial diseases. Abbate et al. [1] indicated that excessive use of anabolic steroids affects the behavior of its in-takers in the form of low self-esteem and low-assertiveness. Kimergård & McVeigh [20] investigated the influence of anabolic steroids on public health. For this purpose, the study conducted face-to-face interviews from 24 in-takers of anabolic steroids. The study revealed that the satisfaction of body needs is the necessary condition for taking the decision that either to take these drugs or not because many people who regularly use these drugs are unconscious about its

chronic effects. Study further concluded that the continued use of these drugs might increase the chance of heart diseases. Pope, Khalsa & Bhasin [26] also revealed that regular usage of anabolic steroids adversely affects the health of individuals. So, it is proposed that

H<sub>3</sub>: “There is significant relationship between anabolic steroids and society”.

#### Height Increase Pills and Society

Rahman, et al. [7] indicated the negative influence of height increasing pills on the health of individuals. The study proposed that the ration of taking these pills increasing day by day but people are not aware about their consequences. The study concluded that excessive amount of these pills results many hormonal problems. Khan et al. [19] concluded that the inappropriate usage of height increase pills may negatively affects the health of individuals in the form of chronic diseases. Maki [22] also demonstrated the adverse effects of height increasing pills on the adults. The study concludes that the usage of these pills provides temporary satisfaction to the individuals but on the long run it adversely affect the health of individuals. So it is proposed that

H<sub>4</sub>: “There is positive relationship between height increase pills and society”.

#### Lipase Inhibitor and Society

Sumithran et al [29] indicated the negative influence of lipase inhibitor on society. The study further proposed that the regular users of these drugs are facing various health problems with in the 10 weeks. Lehmann et al. [21] revealed that the continue usage of Lipase inhibitor create digestive problems for individuals. Grabner et al [16] concluded that instead of using medicine for weight loss, individuals should prefer different exercise because the usage of medicines like lipase inhibitor helps in the temporary weight loss. Nomura & Casida [25] also indicated the acute effects of lipase inhibitor on the health of individuals. So, it is proposed that

H<sub>5</sub>: “There is significant relationship between lipase inhibitor and society”.

## METHODOLOGY

### Sample and Data collection

Study collects the data from 234 individuals of the Pattaya, Thailand. Data are collected through questionnaire, randomly distributed to individuals. Questionnaire is based on the 5-type Likert scale, starts from “1: strongly disagree to 5: strongly agree”. Questionnaire is divided into two parts. First part is based on demographic information, consisting on 4 items, including information regarding gender, age, and qualification. Second portion of questionnaire consists of 5 items of FS, 4 items of AS, 6 items of MS, 4 items of HP, 4 items of LI and 6 items of SOC. Respondents voluntarily filled the questionnaire, no-body was forced to respond.

Description of variables

*Food supplements (FS)*

FS is used as an independent variable (IV) of the study. FS are extensively used by the individuals for their balanced diet. FS provides all those nutrients to the human body, which are missing from the diet.

*Anabolic Steroids (AS)*

AS is another IV of the study. Mostly, AS are used by the athletics for improving their muscles growth and for enhancing their stamina.

*Melatonin supplements (MS)*

MS is also an IV of the study. MS is used by those individuals who are facing chronic insomnia. This supplement helps the individuals in regulating their sleeping habits.

*Height increasing pills (HP)*

HP is another IV of the study. These are commonly used pills among individuals for increasing their height which helps an individual to grow by 2 to 3 inches in six months.

*Lipase inhibitor (LI)*

LI also used as an IV. LI are commonly used by individuals for losing their weight. The main act of LI is to reduce the intestinal fascination of fats.

*Society (SOC)*

Study uses SOC as a dependent variable which is define as a group of people, involving in different activities.

**DATA ANALYSIS**

Study analyzes the data by using the software of Smart PLS. Descriptive statistics are calculated first. Study applies structural equational modeling (SEM) for testing the

proposed hypothesis of the study because SEM is linked with multiple advantages, the most important of which include estimation of multiple relationships. It tests number of hypothesis in a single click. Anyhow, it comprises on two models, measurement model and structural model. Measurement model is used to test the reliability and validity of the data, including convergent, discriminate and construct validity. Structural model tests the collinearity issues and model's good fit. Furthermore, path analysis is conducted for testing the significance of variables.

Model Specification

Study uses following econometric models to empirically investigative the relationship among proposed variables.

$$SOC = \beta_0 + \beta_1(FS) + \beta_2(AS) + \beta_3(MS) + \beta_4(HP) + \beta_5(LI) + \mu$$

Where; "SOC is society, FS is Food supplements, AS is Anabolic Steroids, MS is Melatonin supplemented, HP is Height increasing Pills, LI is Lipase Inhibitor,  $\beta_0, \beta_4$  are coefficients, while  $\mu$  is error term."

**EMPIRICAL RESULTS**

This section provides the empirical findings of proposed model of the study.

Descriptive Statistics

Table 1 shows the results of descriptive statistics of survey items, comprises on the values of mean and standard deviation, and on the minimum and maximum responses of participants. Results indicates that the survey is accomplished by Likert-type 5-point questions, based on 29 items. Responses of 23 items vary from one to five while response of 3 items vary from two to five, and one to four. Mean score of different items range from 2.067 to 3.525 and the value of standard deviations range from 0.698 to 1.249

TABLE 1: Descriptive Statistics

	Mean	Min	Max	Standard Deviation
FS1	2.067	1	4	0.872
FS2	3.450	1	5	1.002
FS3	3.458	1	5	1.039
FS4	3.513	1	5	0.951
FS5	3.639	1	5	1.027
AS1	3.513	1	5	0.934
AS2	3.412	1	5	1.040
AS3	3.370	1	5	0.906
AS4	3.399	1	5	0.863
MS1	3.525	1	5	0.990
MS2	3.408	1	5	0.969
MS3	3.189	1	5	1.116
MS4	3.311	1	5	1.249
MS5	4.403	2	5	0.863
MS6	3.063	1	5	1.237
HP1	3.042	1	5	1.111
HP2	2.655	1	5	0.845
HP3	2.840	1	4	0.698

HP4	2.815	1	4	0.864
LI1	3.870	2	5	1.019
LI2	2.634	1	5	0.906
LI3	2.714	1	5	0.811
LI4	3.525	1	5	0.990
SOC1	3.408	1	5	0.969
SOC2	3.189	1	5	1.116
SOC3	3.311	1	5	1.249
SOC4	4.403	2	5	0.863
SOC5	3.063	1	5	1.237
SOC6	3.042	1	5	1.111

### Convergent Validity

Figure 3 shows the results of convergent validity of each item of the construct. According to [30], convergent validity is present in the item if loading values (shown in figure 3) exceeds from 0.4. Whereas, if the value of any item is less than 0.4, then we have to exclude that item from the

construct for making data valid. In present case, the loading value of FS1 was less than 0.4, so we excluded the item from the construct. However, remaining values are greater than 0.4. highest loading value is 0.915 while the lowest loading value is 0.637

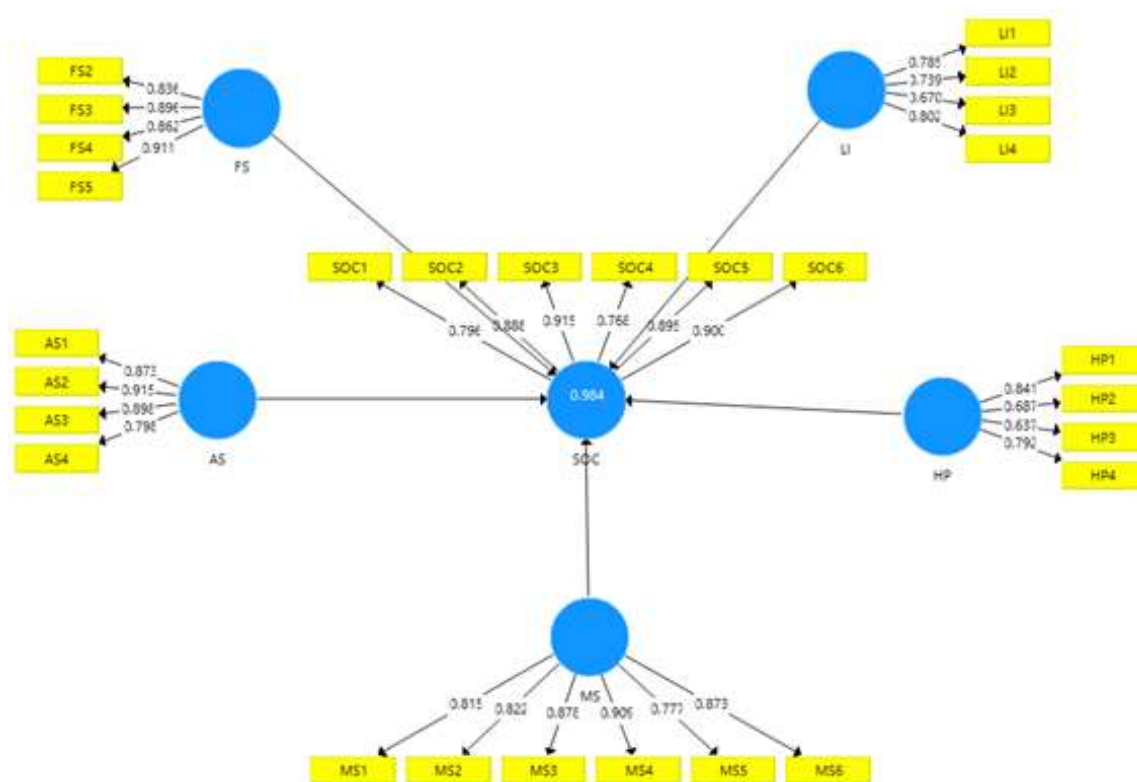


FIGURE 3. Convergent Validity

### Construct Reliability and Validity

Value of Cronbach's alpha (shown in table 2) is used to test the reliability of each construct. For the current sample, values of Cronbach's alpha vary from 0.736 to 0.930, indicating that each multi-item construct contains reliability. The values of AS (alpha = 0.894), FS (alpha = 0.899), HP (alpha = 0.736), value of LI (alpha = 0.742), value of MS (alpha = 0.921), value of SOC (alpha = 0.930) shows that SOC and MS possesses exceptional reliability while remaining construct possesses high reliability. Value of composite reliability (CR) measures the construct validity. The value of CR must exceed 0.4 for satisfying the

condition of construct reliability [30]. In present case, the value of CR (AS= 0.927), FS (0.930), HP (0.830), LI (0.837), MS (0.938), SOC (0.945) exceeds from 0.4, showing the presence construct validity in the data.

### Discriminate validity

Table 3 shows the discriminate validity of the data. The study follows Fornell-Larker criteria for testing the discriminate reliability of the data. According to this criterion, the diagonal values (shown in bold in table 3) must exceed from the remaining values. In present case, all

the diagonal values exceed remaining values. Therefore, it is concluded that discriminate validity is present in the data.

#### Path Analysis

Table 4 shows the results of path analysis which is used for testing the proposed hypothesis of the study. The coefficient of AS (-0.129) indicated significant and negative association between AS and SOC. Hence, H<sub>1</sub> is supported at 1% level of significance. Coefficient of FS (0.131) revealed a positive

association between FS and SOC at 1 % level of significance. Hence H<sub>2</sub> is also supported. Coefficient of HP (-0.125) revealed a negative association between HP and SOC at 1% level of significant. So, H<sub>3</sub> is also accepted by the study. Similarly, coefficient of LI (-0.092) also revealed the significant and negative relationship between LI and SOC. Hence, Accepting H<sub>4</sub> at 1% level of significance. Study also revealed significant association between MS and SOC at 1% level of significance. Thus, H<sub>5</sub> is also supported.

TABLE 2. Construct Reliability and Validity

	Cronbach's Alpha	Composite Reliability
AS	0.894	0.927
FS	0.899	0.930
HP	0.736	0.830
LI	0.742	0.837
MS	0.921	0.938
SOC	0.930	0.945

TABLE 3. Discriminate Validity

	AS	FS	HP	LI	MS	SOC
AS	0.972					
FS	0.888	0.997				
HP	0.791	0.792	0.983			
LI	0.783	0.797	0.828	0.961		
MS	0.606	0.714	0.876	0.611	0.947	
SOC	0.707	0.792	0.769	0.796	0.689	0.962

TABLE 4. Path Modeling

Hypothesis	Coefficients	P Values	Decision
AS --> SOC	-0.129***	0.000	Supported
FS --> SOC	0.131***	0.000	Supported
HP --> SOC	-0.125***	0.000	Supported
LI --> SOC	-0.092***	0.000	Supported
MS --> SOC	-0.295***	0.000	Supported

## CONCLUSION AND DISCUSSION

Life style drugs are the conventional branch of medicines which are used to treat life style illness i.e., sleeping problems, muscle problems, and so on [1]. These drugs can change the non-health related conditions of people [11]. People are extensively using these drugs for changing their physical and mental aptitudes. There is no doubt that the use of life-style drugs, including various nutritional supplements, provides many benefits to the individuals, but the continued use of these medicines makes the person addicted of it. Moreover, it adversely affects the health of individuals [15].

Therefore, present study aims to examine the impact of lifestyle drugs, including food supplements, anabolic steroids, melatonin supplements, height increasing pills, and lipase inhibitor on society. For this purpose, the study collects the data from 234 individuals of the Pattaya, Thailand. Data are collected through questionnaire, randomly distributed to individuals. Study applies structural equational modeling for the empirical estimation of results.

The significance of the results is tested through bootstrapping.

Results of the study revealed that life-style medicines negatively affect the society. Results of the study revealed a negative relationship of AS, MS, HP and LI with SOC. Results are consistent with [6, 32]. Whereas, the study found a positive relationship between FS and SOC. Results are consistent with [9, 31].

The study has few implications: First, government should arrange different awareness programs for their citizens in which citizens might be able to know the side effects of the life-style drugs. Secondly, the sale of life-style drugs should sale only to those individuals who are having the prescription of doctor for that specific drug.

Present study has few limitations: first, this study is conducted in only one city of Thailand that is Pattaya. Future studies may conduct replica of this study in different cities or countries. Second, the study uses only supplements as a proxy of life-style drugs. Future studies might use many other proxies of life style drugs such as antioxidants, NSAIDS etc.



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