

# A Structural Correlation Modeling of Stress and Substance Abuse with the Mediating Role of Meaning in Life and Experiential Avoidance

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## Abstract

**Introduction:** Substance Abuse is a serious threat to societies which cannot be cured without considering the related factors.

**Method:** This study was a structural modeling of stress and substance abuse with the mediating role of meaning in life and experiential avoidance. The statistical population was all studying students at Ferdowsi University of Mashhad in 2019. In this study, 387 students were chosen using multi-stage random cluster sampling. The participants filled out a demographic information form, Substance Abuse and Mental Illness Symptoms Screener (SAMISS), Student Stress Survey (SSS), Multidimensional Experiential Avoidance Questionnaire (MEAQ), and Meaning Life Questionnaire (MLQ). The collected data were analyzed by SPSS-23 and AMOS-23.

**Results:** The total effect model analysis revealed that stress is directly and positively correlated with substance abuse. Also, the analysis of mediation effect model revealed that experiential avoidance positively and partially mediates the relationship between stress and substance abuse. Meaning in life negatively and partially mediates the relationship between stress and substance abuse. The P-value was smaller than 0.05 in both analysis.

**Conclusion:** The current study supported theories that widen the scope with regard to the conceptualization of substance abuse, and identify the meaning in life and experiential avoidance as particularly relevant factors to consider when treating substance abuse.

**Keywords:** Structural Equation Modeling, Stress, Meaning in Life, Experiential Avoidance, Substance Abuse

## Introduction

Substance abuse or drug use for non-medical purposes threaten public health, and severe consequences will likely occur for consumers and their families. According to the latest World Drug Report, approximately 19 million drug-related deaths occurred in 2015. In addition to the use of illegal drugs, non-medical use of tramadol, fentanyl, methadone, buprenorphine benzodiazepines and similar sedative-hypnotic drugs are currently one of the major drug use problems in 60 countries [1]. Substance abuse is defined by the diagnostic and statistical manual of mental disorders as repeated use of drugs and substances that can lead to failure in fulfilling one's obligations such as work, school and home [2].

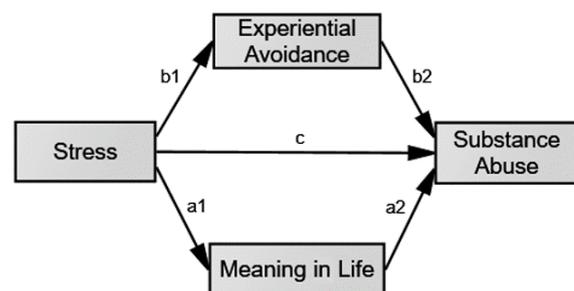
The existing research literature suggests that there is a positive relationship between substance abuse and exposure to stress [3, 4]. Stress affects most people, including students and affects their physical and mental well-being, as well as both their performance in university and home. When stress exists for an extended period of time, it can become a burden or even a health risk [5]. If the stress is at a level that is beyond one's ability and that

one is not equipped with the appropriate and effective coping skills, that individual is more vulnerable to psychological disorders [6]. Although many factors are involved in initiating and continuing drug use, it should be noted that stress has been identified as an important factor leading to drug abuse [7]. In a well-adjusted relationship, one strives to balance the stressful demands of life and one's ability to cope with such problems. When healthy methods are not available, substance abuse behaviors become one of the most effective coping strategies to maintain balance processes [8]. In a study examining the relationship between perceived stress and severity of drug and alcohol dependence, Arévalo Prado and Amaro found that perceived stress was significantly and positively related to the severity of drug dependence [9]. The findings of another study by Pour Seyyed Moussaie et al. showed that stress can be an important predictor of craving in drug dependents [10]. Moeini et al. showed stress-management training might be effective in promoting readiness for substance use treatment [11].

On the other hand, experiential avoidance is involved in a wide range of clinical problems and disorders including substance abuse. For example, people who use the avoidance method are more likely to develop drug use [12]. If a person has a negative belief about stress or anxiety, then he or she is likely to use problematic coping strategies such as avoidance, substance abuse, and other harmful responses [13]. The results of a research by Mohammadpour et al. showed that there is a relationship between perceived stress with experiential avoidance in substance dependents. Also experiential avoidance can positively and significantly predict perceived stress in substance abusers [14]. Furthermore, an association between experiential avoidance and substance abuse has been reported by previous studies [15]. Another study revealed that experiential avoidance played a mediating role in the relationship between stress and substance abuse [16].

Yalom states that the meaning in life is a belief in the world in a purposeful pattern that can originate from religion or spirituality [17]. It has been found that people who do not have much understanding of meaning in life experience higher levels of psychological disorders than people who have a strong understanding of meaning in life [18]. Frankl believed that the lack of meaning and the existential vacuum associated with constant conflicts of life can lead to substance abuse as a source of relief [19]. According to a study, the lack of meaning in life increases the likelihood of substance abuse through increased morbidity and sensitivity to social pressures [20]. Research has examined the role of meaning in life as a mediator between depression and substance abuse. The findings showed that there was a significant negative correlation between the meaning in life and substance abuse [21]. Researchers have found a significant relationship between stress and the meaning in life. For example, a study investigating the effect of stress management on the meaning in life for unmarried women showed that promoting stress management increased the meaning in life [22].

Researchers have begun exploring the mechanisms by which stressful life events increase the risk of psychological distress [23]. The impacts of stress include disruption of emotion regulation processes [24], challenge meaning systems, and destroy assumptions about the self, the world, and others [25] and impede the process of identifying core values. An exploration of how behavioral avoidance strategies, including substance abuse behaviors, are incongruent with core values provides a rationale for studying the relationship between meaning in life and substance abuse. Substance abuse as a serious issue in people's lives and in societies is associated with many variables such as stress, experiential avoidance, and the meaning in life. This issue makes the topic of substance abuse worthy of study. Identifying the predictors of this disorder, as well as identifying the factors that mediate its development or enhancement and that continue to be a disruption and barrier to treatment, may have a significant role in reducing this disorder. This study aims to explain the relationship between stress and substance abuse and the mediating role of experiential avoidance and meaning in life. In this study, substance abuse is considered as an endogenous variable and stress as an exogenous variable and experiential avoidance and meaning in life as mediator variables. The relationships between variables are plotted in a conceptual model in Figure 1.



**Figure 1.** Conceptual Model of the Relationship between Endogenous, Exogenous and Mediator Variables

## Method

This research is a descriptive correlational structural model that was designed to model the structural relationship between stress and substance abuse through the mediation of experiential avoidance and the meaning in life. The statistical population of this study included all students studying at the Ferdowsi University of Mashhad in 2019. According to the formula and table of Krejcie and Morgan (1970), 387 individuals studying in the academic year of 2019-2020 were selected through multistage cluster sampling. At first, ethical considerations such as confidentiality of information and participants' satisfaction were taken into account. Then all participants completed the research questionnaires. After extracting the questionnaires, the data were checked and some missing, indifferent, and outliers were considered. Data were analyzed by SPSS-23 and AMOS-23 software. The Pearson Correlation Test and Structural Equation Modeling were used for analyzing.

The tools used in this study were as follows:

**Student Stress Survey (SSS):** This is a questionnaire designed by Ross et al. [26] to measure major sources of stress among college students. The SSS is comprised of 40 items divided into four areas of stress: interpersonal, intrapersonal, academic and environmental. Six items represent interpersonal sources of stress, 16 items represent intrapersonal sources of stress, eight items represent academic sources of stress and 10 items represent environmental sources of stress. The participants were asked to consider how much of a problem each item was over the past 12 months and rate severity on a four-point scale ranging from "no problem at all" to "very much a problem." Higher values reflect greater levels of stress. In assessing the validity and reliability of the questionnaire, all measured variables loaded significantly onto their hypothesized factors ( $p < 0.01$ ) and the obtained factors were 0.63, 0.85, 0.75 and 0.70 for interpersonal, intrapersonal, academic, and environmental areas [16]. The Cronbach's alpha in this study for interpersonal, intrapersonal, academic, and environmental dimensions were 0.65, 0.78, 0.74 and 0.69 respectively.

**Multidimensional Experiential Avoidance Questionnaire (MEAQ):** This questionnaire was developed by Gamez et al. [27]. It has 62 items on the six-point Likert scale and the total score ranges from 62 to 317. Higher scores indicate greater experiential avoidance. It also has six subscales. Gamez et al. reported Cronbach's alpha coefficients in the samples ranging from 0.91 to 0.95 and the correlation of this tool with the commitment and action questionnaire of Hayes was 0.74. Cronbach's alpha coefficients were 0.77, 0.70, 0.55, 0.78 and 0.79 for behavioral avoidance, distraction/suppression, denial/repression, and distress tolerance respectively. Average inter-item correlation for the MEAQ is in the low to moderate range (0.15), which reflects the multidimensional nature of the questionnaire [27]. The Persian version of the MEAQ has acceptable psychometric properties in the students and clinical population. The results from confirmatory factor analysis confirmed 44 items into six factors and 42.19% of the total variance is explained. The Multidimensional structure was consistent with the internal correlation. The Cronbach's alpha coefficient for the total questionnaire was 0.842. [28]. For the present study, the obtained values of Cronbach Alpha was 0.81.

**Meaning in Life Questionnaire (MLQ):** This questionnaire measures two dimensions of meaning in

life, namely the presence of meaning and the search for meaning by using 10 items on a seven-point Likert scale from completely false (1) to completely true (7). The highest score for this questionnaire is 70 and the lowest score is 10. Higher scores reflect that the meaning in life is better. Steger and Shin (2010) show that the questionnaire meets the reliability and consistency criteria and include convergent and discriminant validity [29]. For example, for both scales, it has reported a very good internal consistency (alpha coefficients between 0.82 and 0.87). Furthermore, the reliability of 0.70 for presence subscale and 0.73 for search subscale were obtained within one month [30]. Mesrabadi et al. have used a hierarchical discriminative function analysis for discriminative validity analysis and have obtained  $\lambda = 0.89$ ,  $P \leq 0.01$ . It showed that the construct validity of MLQ is acceptable for a sample of Iranian students [31]. For the present study, the coefficients of Cronbach's alpha in two dimensions of search and presence of meaning were obtained, 0.76 and 0.79, respectively.

**The Simple Screening Instrument for Substance Abuse and Mental Illness (SAMISS):** This tool was designed by Whetten et al. [32] in the field of mental health and has been widely used to illustrate the issue of substance abuse. Its reliability and validity have also been confirmed. Factor loading was 0.85 for all items in overall [16]. The sensitivity and specificity of the SAMISS was 94 % (95 % CI: 88–98 %) and 58 % (95 % CI: 52–65 %) [33]. The positive predictive value of the screener in comparison to the SCID was 98.6% of substance use disorders. The agreement between specific screener symptoms and their corresponding SCID diagnoses was relatively high for alcohol dependence ( $\kappa = 0.50$ ,  $p < 0.001$ ) and drug abuse ( $\kappa = 0.42$ ,  $p < 0.001$ ) [32]. The SAMISS contains six items assessing symptoms of substance abuse. Each item determines frequency and amount of substance use and participants respond to questions on a five-point Likert scale ranging from 0 (*Never*) to 4 (*4 or more times per week*). Individual item scores are totaled which provides a continuous total scale score, with higher values reflecting the severity of substance abuse. In the current study, the obtained values of Cronbach Alpha was 0.78.

## Results

The minimum age of participants was 18, the maximum 45, and the average 23.47 years. The other demographic characteristics of participants, including gender, education, and marital status are presented in (Table 1).

**Table 1.** Frequency and Percentage of Participants' Gender, Marriage, and Education

Variable	Frequency	Percentage
Gender		
Female	213	55.9
Male	168	44.1
Education		
Bachelor Student	245	64.3
Master Student	105	27.5
PhD Student	31	8.2
Marriage		

Unmarried	279	73.2
Married	102	26.8

Table 2 presents the concentration and dispersion indices including mean, standard deviation, range of variation, skewness, and kurtosis for all variables separately. Multivariate normality is one of the prerequisites for applying covariance-based structural equation modeling to maximum likelihood. As presented in Table 2, the distribution of the scores of variables follows the normal distribution. Also, in this study, the Shapiro-Wilk test was used and the results are presented in (Table 3). The p-value for all variables is greater than 0.05. This indicates the normal distribution of scores across all variables. Pearson correlation coefficient was used to investigate the correlation between variables. The results are shown in (Table 4). P-value was zero for all correlations.

Due to the sensitivity of the sample size, the chi-square index usually becomes meaningful which means poor and undesirable fitting. If the sample size is small, it often does not recognize the difference of models and when the sample size is large, the smallest difference between the hypothesized model and the observed is significant. Therefore, other indicators designed for this purpose are used to evaluate the fit of the model. In general, when at least three indexes have values in the acceptable range, the model fit is considered good and acceptable [34]. The model fit indices are listed in (Table 5). The total effect model of Baron and Kenny method were used for testing the direct relationship between stress and substance abuse. The diagram of this model is shown in Figure 2 and the statistical results of the analysis are presented in Table 6.

**Table 2. Indexes of Concentration and Dispersion of Variables**

variables	Mean	Std	Rang	Skewness	Kurtosis
Stress	48.30	15.39	80	0.161	-0.311
Experiential Avoidance	129.14	39.92	210	0.129	-0.289
Meaning in Life	35.04	7.74	41	0.133	-0.281
Substance Abuse	22.21	5.05	27	0.114	-0.193

**Table 3. Investigation of Natural Distribution of Variables' Scores by Shapiro Wilk test**

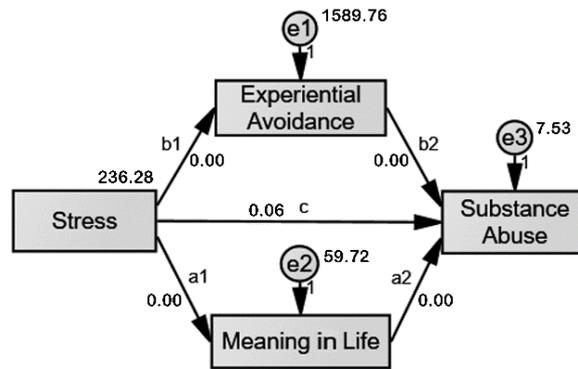
variables	Statistic	DF	P-value
Stress	0.995	387	0.193
Experiential Avoidance	0.995	387	0.326
Meaning in Life	0.994	387	0.142
Substance Abuse	0.994	387	0.104

**Table 4. Correlation between Variables with Pearson Test**

variables	Substance Abuse	Meaning of Life	Experiential Avoidance	Stress
Stress	0.839	-0.453	0.783	1
Experiential Avoidance	0.904	-0.529	1	
Meaning in Life	-0.535	1		
Substance Abuse	1			

**Table 5. Model Fit Indexes**

Index	Amount	Limit
Goodness of fit chi-square	0.000	p-value>0.05
Root Mean Square Error Approximation	0.614	Less than 0.1
Comparative Fit Index	0.901	Higher than 0.9
Normed Fit Index	0.901	Higher than 0.9
Incremental Fit Index	0.901	Higher than 0.9
Goodness of Fit Index	0.945	Higher than 0.9



**Figure 2.** Total Effect Model Diagram

The results in Table 6 indicate the  $p\text{-value} \leq 0.00$ , which means, the independent variable affects the dependent variable. The positive regression coefficient means that as the independent variable increases, the dependent variable also increases and with the decrease of the independent variable, the dependent variable decreases. Therefore, the first assumption that which stated that stress is related to substance abuse is confirmed.

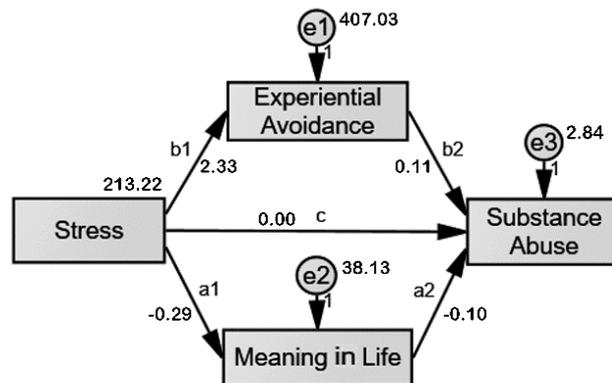
Mediator variables explain the relationship between two variables. Therefore, the first step in the mediation test is to ensure that there is a direct relationship between the independent and dependent variables. For this purpose, in the previous section, the direct relationships between stress and substance abuse were investigated and the significance of this relationship was determined. In the second step, only indirect paths were checked including

the relationship of stress with experiential avoidance and meaning in life. Also, the relationship of experiential avoidance and meaning in life with substance abuse were checked. This model is called the indirect effect model (Figure 3). Statistical results are presented in (Table 7).

The results in Table 7 show that the P-value for all paths is zero, which means that the experiential avoidance in the positive direction and meaning in life in the negative direction play a mediating role between stress and substance abuse. When the meaning in life and experiential avoidance are present, if stress has relationship with substance abuse, mediation is partial and otherwise mediation is complete. In step 3, all paths are processed simultaneously to show the role of mediator variables. This model is called the mediation effect model (Figure 4). The statistical results are presented in Table 8.

**Table 6.** Statistics of Total Effect Model

	Estimate	S.E	C.R	P-value	Label
Effect of Stress on Substance Abuse	0.059	0.016	3.602	0.0001	c



**Figure 3.** Indirect Effect Model Diagram

**Table 7.** Statistics of Indirect Effect Model

	Estimate	S.E	C.R	P-value	Label
Effect of stress on experiential avoidance	2.333	0.086	27.04	0.0001	a1
Effect of stress on meaning in life	-0.290	0.025	-11.78	0.0001	a2
Effect of experiential avoidance on substance abuse	0.108	0.003	34.85	0.0001	b1
Effect of meaning in life on substance abuse	-0.096	0.016	-6.12	0.0001	b2

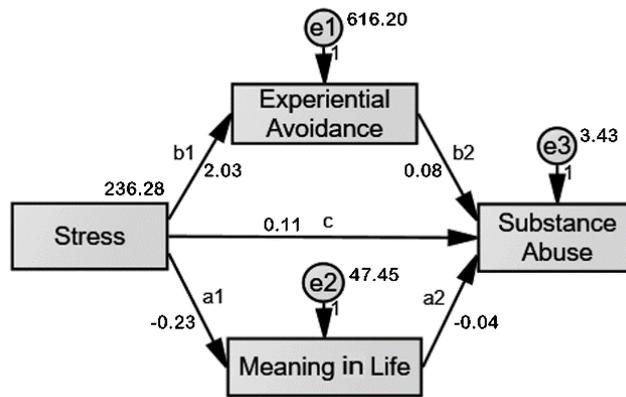


Figure 4. Mediation Effect Model Diagram

Table 8. Statistics of Mediation Effect Model

	Estimate	S.E	C.R	P-value	Label
Effect of Stress on Substance Abuse	0.109	0.013	8.54	0.0001	c
Effect of stress on experiential avoidance	2.030	0.082	24.69	0.0001	a1
Effect of stress on meaning in life	-0.228	0.023	-9.98	0.0001	a2
Effect of experiential avoidance on substance abuse	0.077	0.005	16.71	0.0001	b1
Effect of meaning in life on substance abuse	-0.040	0.017	-2.37	0.018	b2

The results in Table 8 show that the p-value of all paths is less than 0.05 and the measurement model demonstrated good fit (CFI=0.901, GFI=0.945, NFI=0.901). Hence, the analysis of mediation effect model showed that experiential avoidance positively and partially mediates the relationship of stress and substance abuse and the meaning in life negatively and partially mediates the relationship of stress and substance abuse.

**Discussion**

Analysis of the total effect model and the mediation effect model showed that stress had a positive and direct effect on substance abuse with and without the presence of the mediating variables. These findings are in line with the results of other studies [3, 4, 8]. In the mediation effect model analysis, the results indicated that experiential avoidance positively and partially mediates between stress and substance abuse. These results are supported by the results of a research [14] which has pointed out to the relationship of stress with experiential avoidance. Other studies [12, 15, 16] have shown the relationship of experiential avoidance with substance abuse. Also, the meaning in life negatively and partially mediates between stress and substance abuse. These results are in line with previous studies [20, 21, 22].

Meaning in life involves a sense that the world is predictable and hence controllable [35]. Uncontrollability is considered as an important cause of stress. So, it can be stated that inner processes that enhance the perception of control over the environment could decrease one's levels of stress [36]. Therefore, it can be resulted that people who have a good sense of the meaning in life may cope with stress better than others. Disruptions to the process of meaning-making, including stressful life events [37] may instigate a reliance on behavioral avoidance strategies such as substance abuse [38]. Another effect of stress is the development of behavioral avoidance

strategies such as methods of coping [24]. Experiential avoidance can proliferate through a variety of behaviors ranging from benign to potentially destructive. The potential of experiential avoidance manifests itself through health-risk behaviors such as substance abuse [39].

**Conclusion**

The purpose of this study was to better understand the mechanisms by which stress contributes to the risk of substance abuse. This goal was partially met as all the direct and indirect paths were significant. Simply put, higher levels of stress can predict an increase in substance abuse. Also, increasing stress can predict an increased likelihood of substance abuse by increasing experiential avoidance. On the other hand, higher levels of stress in individuals can predict a decrease in the meaning in life, and a decrease of meaning in life can predict a likelihood of an increase in substance abuse. This study, in addition to showing stress as one of the factors that can lead to more severe disorders such as substance abuse, showed that the meaning in life and experiential avoidance are certain variables that should be considered during the prevention and treatment of substance abuse.

There were some limitations to this research, including the large number of questions which increased the likelihood of making mistakes. Also, this research has been carried out in student and normal samples therefore, care should be taken in generalizing the results to clinical groups. It is suggested that, if possible, this study be repeated on clinical samples and that the results be compared with the present study. Also, it is recommended that more research be done on other psychological mechanisms that underlie substance abuse. This research can be useful for conceptualizing and treating this disorder.

**Conflict of Interest**

The authors declare no conflicts of interest.

## Ethical Approval

This study was conducted according to ethical standards.

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