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Prevalence and Factors Associated With Tramadol Abuse Among College Students in West of Iran: An Application of the Theory of Planned Behavior

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Background: Tramadol is an opioid analgesic indicated for the treatment of moderate and severe pains. In the case of long administration, tramadol has a potential to cause dependency, tolerance and drug abuse.
Objectives: This study aimed to investigate the prevalence and factors associated with tramadol abuse among college students based on the Theory of Planned Behavior (TPB) as a theoretical framework.
Patients and Methods: This descriptive-analytical study was performed on 400 college students of Hamadan universities recruited with a stratified sampling method. The data-gathering tool was a questionnaire based on the TPB constructs. Data was analyzed by logistic regression and bivariate correlations using SPSS-19 software.
Results: The subjects reported 50%, 35% and 77% of maximum receivable scores of attitude, subjective norm and perceived behavior control, respectively. In total, 12.5% of participants indicated drug abuse in the past. Subjective norms and perceived behavioral control were better predictors for tramadol abuse.
Conclusions: Results demonstrated the unique importance of subjective norms and perceived behavioral control when examining substance abuse among college students.

Keywords: Cognition; Students, Substance-Related Disorders; Tramadol

1. Background

Substance abuse is a predictable process. It begins with an initial experience of recreational use of cigarettes, alcohol, and opioid analgesic and continues with using marijuana, cannabis, and other drugs and stimulants (1, 2). According to the United Nations Office on Drugs and Crime in 2009, the number of consumers of various drugs was estimated around 149 to 279 million people, including 3.3 to 6.1 of the world's population of 15 to 64 years (3); in this regard, using opioid analgesics is of particular importance as the initial experience and recreational use in most instances (4). Tramadol is an opioid analgesic used among youth, particularly college students (5). It is a centrally acting atypical opioid drug with an approved impact on the μ-opioid receptors (6, 7).

After formal announcement of prohibition of injectable diclofenac, tramadol was released to the Iranian pharmaceutical market as an alternative analgesic. Although the drug is an opioid, no legal restriction was imposed on its sale and distribution; furthermore, its consumption spread in the society, regarding an attitude towards fast and symptomatic relief of pain, as well as competition among physicians, particularly general practitioners to treat patients (8). Initially, it seemed to have a very low risk of drug dependency, but its long-term use may result in drug dependence (9). Some effects of tramadol tablet abuse are psychosis and brain disorders, double personality, inability in decision-making, lack of coordination in walking and dried mouth (10).

Taremian in his study conducted on students in Tehran in 2005, (11) reported the rate of tramadol abuse as 5%; however, tramadol abuse has been highly increased in the society in the recent years. Tramadol abuse rate was reported as 26.5% according to the Iran Drug Control Headquarters statistics among substance abusers (5). The reasons for this increase might be due to easy access of tramadol, uncertainty of parents regarding its negative consequences, and no serious effort for preventive programs (12). This trend suggests that substance-related health campaigns were ineffective for college students, and more research is needed to understand and reduce tramadol abuse in students.

Most effective analytical studies are based on theory-driven approaches such as social cognition models. Social cognition models within health psychology focus

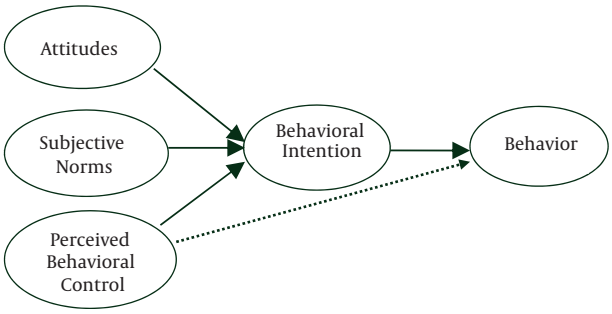

Figure 1. Theory of Planned Behavior (TPB)

on understanding the cognitive determinants of social behaviors, because they are thought to be more modifiable than other behavioral factors (13). One model often used in the health context to examine the determinants of behavioral decision making is the Theory of Planned Behavior (TPB) (Figure 1) (14).

TPB is constituted of attitude, subjective norms, perceived behavior control, intention, and behavior and predicts the occurrence of a particular behavior, provided that the person has the intention to perform the behavior (14). Identifying predictors of tramadol abuse in preventive programs is very important.

2. Objectives

This study used the TPB to analyze tramadol abuse among college students.

3. Patients and Methods

3.1. Participants

This was a cross-sectional study performed on 18 to 30 years age college students in Hamadan City in west of Iran during 2012. Four hundred students were recruited from different universities (three public and one private universities) based on multistage random sampling method. At first, universities were selected proportionally based on the ratio of the total number of students in every university to the total number of students in Hamadan city. Second, stratified sampling was performed in every university according to faculty size and at the third stage, students were selected through simple sampling method. This study was approved by the institutional review board and ethical committee of Hamadan University of Medical Sciences. Informed consent was obtained from all participants before the project. Participants were ensured that they could decide whether to participate in the research. Prior to the main project, a pilot study was conducted to obtain feedback about the clarity, length, comprehensiveness, and completion time of the questionnaire, as well as estimating the internal consistency of the questionnaire.

3.2. Measures

The self-administered questionnaire included closed questions and required approximately 30 minutes to complete. The questionnaire included three sections as follows; a) Demographic and background variables including age, gender, grade, dwelling, having history of smoking (never, occasionally, always), and using illicit drugs (never, occasionally, always); b) Tramadol abuse: College students were asked if they had used tramadol. Participants were put into one of the following tramadol abuse categories: never used; used, but not in the past 12 months; used, but not in the past 30 days; used in the past 30 days; used in the past 7 days; and using every day. Participants who used tramadol in the past were considered as users of tramadol; c) TPB Theoretical constructs: TPB scale was designed based on a standard questionnaire and included 33 items under four constructs including (a) attitude, (b) subjective norms, (c) perceived behavioral control, and (d) behavioral intention.

3.3. Attitude

Twelve items were designed to assess attitude toward tramadol abuse (e.g. “If I were to use tramadol it would help me to forget problems”). The items were rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated more positive attitude to tramadol abuse. The 12-item scale had Cronbach’s alpha of 0.85.

3.4. Subjective Norms

Subjective norms were measured in relation to the best friend, other friends, family, and people who use each of the drugs. A sample item was “My best friend thinks I should not or should use this drug”. The items were rated on a 5-point scale ranging from 1 (should not) to 5 (should). Motivation to comply with each of the referent groups was measured with items for each group. A sample item was “Regarding the use of this drug, I want to do what my best friend thinks I should”. The items were rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). These items were multiplicatively combined and averaged. The 8-item scale had Cronbach’s alpha of 0.71.

3.5. Perceived behavioral control

A belief-based measure of PBC (perceived behavioral control) was employed. Control beliefs were assessed in relation to availability of tramadol, having important work to do, being in a bad mood, being in a good mood, and being under the influence of another drug. The items were rated on a 5-point scale ranging from 1 (infrequently) to 5 (frequently). Power item measures were taken for each of the control beliefs. For example, “Being in a bad mood makes me use this drug”, which was rated

on a 5-point scale ranging from 1 (less likely) to 5 (more likely). These measures were multiplicatively combined and averaged. The 12-item scale had Cronbach's alpha of 0.75.

3.6. Intention

Intention to use was assessed using a single item. The item was "Please state how often you intend to use the drug over the next 6-month period (if ever) by ticking the appropriate box". The choices were rated on a 6-point scale ranging from 1 (never) through 4 (every few months) to 6 (every day). Higher scores indicate more intention to tramadol abuse.

3.7. Data Analysis

All statistical analyses were performed using version 19.0 of the statistical software package (SPSS Inc. Chicago, IL, USA) and an alpha level of 0.05 for all statistical tests. A series of logistic regression and bivariate correlations and descriptive analysis were computed to determine tramadol abuse and predictive factors.

4. Results

From 400 participants, 53.8% were female, and 80.4% were single. Age of respondents ranged from 18 to 30 years, with a mean age of 22.1 years (SD = 2.2). The frequency of 21-25 years age group was the highest (67.2%). Almost less than a half of the participants (49%) lived with their parents and one-quarter (33%) lived in dormitory. Regarding the educational status, 84.2% of respondents were undergraduates, and 15.8% were postgraduates. More than two-quarters of respondents (69%) were from state universities and others were from private ones. At baseline, 9.7% of students reported unsafe sexual behaviors (without using condoms, or having multiple sexual partners). In addition, 22.3% and 7.8% of participants reported to have a history of smoking and illicit drugs consumption, respectively.

Table 1 shows bivariate associations between the TPB variables. Attitude was significantly related to subjective norms (r = 0.402) and intention (r = 0.184), but non-significant correlation was found between attitude and perceived behavioral control (r = -0.081). Additionally, subjective norms were significantly related to perceived behavioral control (r = -0.281), and intention (r = 0.319), also there was a significant correlation between perceived behavioral control and intention (r = -0.311).

As can be seen in Table 2, hierarchical logistic regression analysis was performed to explain the variation in tramadol abuse intention. Attitude and perceived behavioral control significantly predicted tramadol abuse intention, χ^2 (2, N = 400) = 64.7, P < 0.001, and accounted for 26% of the variance (based on the Nagelkerke R^2). Besides, hierarchical logistic regression was used to predict whether participants engaged tramadol abuse from (a) intention, and (b) perceived behavioral control. Intention and perceived behavioral control significantly predicted whether participants engaged in tramadol abuse, (χ^2 [1, N = 400] = 131.59, P < 0.001), and accounted for 53% of the variance (based on the Nagelkerke R^2). Intention was a better predictor of behavior (OR = 15.263) compared to perceived behavioral control (OR = 0.895) (see Table 3).

The frequency of lifetime tramadol abuse was 12.5% (50 participants), and 11% (44 participants) had used tramadol within the past year, while others (38 participants) had used tramadol within the previous month (Figure 2).

Table 1. Descriptive Statistics and Intercorrelations Between the TPB Variables (N = 400)

Variables	1	2	3	4	Mean ± SD
Attitude Toward Tramadol Abuse	1	0.402[a]	-0.081	0.184[a]	30.34 ± 7.2
Subjective Norms Toward Tramadol Abuse	-	1	-0.281[a]	0.319[a]	14.54 ± 5.1
Perceived Control Tramadol Abuse	-	-	1	-0.311 [a]	46.51 ± 7.9
Intention to Tramadol Abuse	-	-	-	1	1.21 ± 0.6

[a] P < 0.001.

Table 2. Logistic Regression Predicting Tramadol Abuse Intention With TPB Variable [a,b]

Step	B	SE	OR	P Value
1				
Attitude	0.033	0.027	1.033	0.230
Subjective norms	0.120	0.034	1.124	0.001
Perceived behavioral control	-0.091	0.019	0.913	0.001
2				
Subjective norms	0.133	0.032	1.142	0.001
Perceived behavioral control	-0.093	0.019	0.911	0.001

[a] Abbreviations: B, unstandardized regression coefficient; SE, standard error; OR, odds ratio
[b] N = 400.

Table 3. Logistic Regression: Predicting Tramadol Abuse With TPB Variable [a,b]

	B	SE	OR	P Value
Step 1				
Intention	2.726	0.405	15.263	0.001
Perceived behavioral control	-0.110	0.024	0.895	0.001

[a] Abbreviations: B, unstandardized regression coefficient; SE, standard error; OR, odds ratio
[b] N = 400.

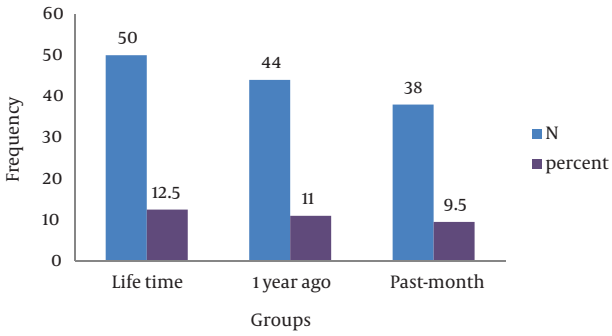

Figure 2. The Frequency Distribution of Tramadol Abuse by the Subjects

5. Discussion

The current study was conducted to evaluate tramadol abuse to design effective strategies to prevent substance abuse. Our findings showed that 12.5% of participants had experienced tramadol abuse at least once. In this regard, the rate of substance abuse among students in this investigation was higher than other studies (11, 15, 16). This discrepancy might be due to differences in study populations; for instance, some studies only included one gender or one public university as their study population (17). While no attention was paid to changing patterns of drug use over time (1), as well as cultural and economic differences among students in public and private universities and differences among various disciplines (2).

Analysis of attitude revealed that the students with a mean score of 50% were not in a good condition and many of them had a positive attitude towards taking tramadol. The results in this section are consistent with the findings of similar studies (4, 18). To explain the findings of this section, substance abuse behavior is affected by individuals' cognition and beliefs. Therefore, educational programs of healthy behavior construction aimed to prevent addiction could result in a negative attitude of people in various dimensions.

A significant portion of students reported very high and strong encouraging subjective norms for tramadol abuse. The results in this regard are consistent with the findings of other studies (4, 12, 19, 20). Motivations of peers play a pivotal role in the onset of substance use. It seems that friendship with peers with substance abuse and belonging to a group as one of the most important needs of adolescents are the reasons for the highlighted role of mentioned findings (12).

Regarding the perceived behavioral control, findings showed a mean score of 77.5% from the maximum obtainable score. The results of this study are consistent with the findings of similar studies (21, 22). Accordingly, psychological studies have mentioned that individuals with low self-esteem or poor sense of personal control can be more affected by advertisement and are more likely to use drugs. An intention to take tramadol was reported by 14.7% of the students. In this regard, the association between behavioral intention and substance abuse and in a more general expression, risky behaviors has been reviewed and approved in several studies (4, 12, 21, 23). Many studies have noted that not decreasing behavioral intention, as the prebehavior step, can be a powerful risk factor to experience drug abuse. Generally, our results showed that subjective norms and perceived behavioral control, as the two main constructs of TPB, were associated with tramadol abuse intention. In addition, intention and perceived behavioral control predicted tramadol abuse behavior. Perceived behavioral control has a significant role to predict intention and behavior simultaneously. The TPB suggested that PBC of the focal person in a decision making situation may affect behavioral intentions. The TPB suggested that the individual's decision making and behavioral intention dependent on "PBC" as an important variable. (14). These results are consistent with the findings of other researchers in the field of high-risk behaviors (21, 22, 24, 25). In this context, particular attention to educate life skills emphasizing skills of substances rejection seems necessary. This study had some limitations. First, data collection was based on a self-reporting method, which may raise the possibility of information bias. Second, these analyses were cross-sectional; longitudinal studies are needed to understand long-term trends of tramadol abuse among college students.

We concluded that almost one-quarters of the participants had used tramadol within their lifetime. Furthermore, the results indicated the effectiveness of TPB to predict students' behavior towards tramadol abuse. Therefore, it is recommended to implement educational interventions using the theory of planned behavior with emphasis on subjective norms and perceived behavioral control to facilitate the prevention of substance abuse.

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Authors' Contributions

Saeed Bashirian and Majid Barati developed the original idea and the protocol, abstracted and prepared the manuscript. Yadollah Fathi participated in study design and analyzed the data. All authors provided comments and approved the final manuscript.

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