

# Knowledge, attitude, and practice of Iranian adolescent girls towards 3-4-methylenedioxymethamphetamine

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## ABSTRACT

**الأهداف:** التحقق من مدى معرفة، وممارسة، ومواقف الفتيات الإيرانيات تجاه تعاطي العقار المخدر إكستازي (Ecstasy).

**الطريقة:** أجريت هذه الدراسة المقطعية في جامعة طهران للعلوم الطبية، طهران، إيران وذلك خلال الفترة من أكتوبر إلى ديسمبر 2008م، وشملت العينة العشوائية الفتيات المراهقات اللاتي تتراوح أعمارهن ما بين 14-18 عاماً وينتمين إلى 57 مدرسة ثانوية بطهران. لقد تم الحصول على الموافقة الرسمية من جميع المشاركات في الدراسة. وتم اعتماد الاستبيان التقييمي المكون من 61 فقرة والذي قام بوضعه باحث متخصص في هذا المجال، كما أنه يتميز بالثبات والمصدقية وذلك من أجل التقصي عن الصفات الديموغرافية، ومعرفة، وممارسة، ومواقف المشاركات تجاه الإكستازي، وقد كان عليهن ملأ فقراته باسم مجهول في المدارس. يتكون هذا الاستبيان من 4 مواضيع أساسية لتقييم الفتيات وهي كالتالي: البيانات الديموغرافية (14 فقرة)، والمعرفة (10 فقرات)، والمواقف (24 فقرة)، والممارسات (13 فقرة) تجاه تعاطي هذا العقار. لقد تم اعتبار نتائج الدراسة عالية من الناحية الإحصائية حيث وصلت القيمة الاحتمالية إلى  $p \leq 0.05$ .

**النتائج:** شارك في هذه الدراسة 4116 مراهقة، وأشارت النتائج إلى أن نسبة عالية من المشاركات كانت معرفتهن ضعيفة (70%)، ومواقفهن إيجابية تجاه تعاطي الإكستازي (80%)، وممارستهن معتدلة (60.4%) لهذا العقار. كما أن النتائج أشارت إلى وجود علاقة كبيرة بين المعرفة والمواقف من جهة وكذلك علاقة بين المواقف والممارسات من جهة أخرى وذلك فيما يخص تعاطي الإكستازي (معامل سبيرمان لارتباط الرتب  $(p=0.003)$  (0.760 =

**خاتمة:** أظهرت الدراسة مدى تدني معرفة، وممارسات، ومواقف الفتيات الإيرانيات تجاه تعاطي الإكستازي، ولذلك فنحن بحاجة إلى تثقيفهن حول مخاطر هذا العقار وإدخال البرامج التعليمية الملائمة لتحقيق ذلك.

**Objectives:** To investigate knowledge, attitude, and practice (KAP) of Iranian adolescent girls towards 3-4-methylenedioxymethamphetamine (MDMA [Ecstasy]).

**Methods:** A cross-sectional design study was conducted on female adolescents in Tehran high schools. The study took place in Tehran University of Medical Sciences, Tehran, Iran in October to December 2008. A

randomized cluster sample of adolescent girls from 14-18 years old, and enrolled in 57 public high schools of Tehran were selected. A written informed consent was obtained from all study participants. In order to assess the participants' demographic characteristics, and KAP towards Ecstasy, a 61-item, researcher-made, valid, and reliable questionnaire was completed anonymously by all participants at schools. The questionnaire included 4 main domains assessing adolescents': 1. Demographic characteristics (14 items), 2. Knowledge (10 items) 3. Attitude (24 items), and 4. Practice (13 items) toward Ecstasy. Results were considered significant at  $p \leq 0.05$ .

**Results:** A total of 4116 adolescents participated in the study. A high proportion of respondents had little knowledge (70%), positive attitude (80%), and moderate practice (60.4%) towards Ecstasy. In addition, findings revealed a significant relationship between knowledge-attitude and attitude-practice with respect to Ecstasy use (Spearman correlation coefficient,  $r_s=0.760$ ,  $p=0.003$ ).

**Conclusion:** Considering adolescents' improper KAP toward Ecstasy, it is obvious that there is a need for appropriate educational interventions to inform adolescent girls regarding the harmful effects of Ecstasy.

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Drug abuse is an area of increasing concern due to its wide ranging, destructive consequences to individuals, societies, and the world.<sup>1</sup> With the emergence of chemical and synthetic mood altering drugs, the picture of addiction trend has been transformed.<sup>2</sup> During the 1980's, heroin was a popular agent, and since then, 3-4-methylenedioxymethamphetamine (MDMA [Ecstasy]) has been gradually introduced to young people, and is being misused in parties and night clubs as a "non-addictive" drug. However, the effect of Ecstasy on the likelihood of engaging in high risk behaviors, physical, and psychosocial disorders is more than heroin.<sup>3</sup> Ecstasy is a derivative of amphetamines, which is known as MDMA, and categorized as stimulants.<sup>4</sup> The chemical structure of Ecstasy is similar to methamphetamine that brings stimulatory side effects, and mescaline, with its hallucinatory side effects.<sup>5</sup> Sexual and behavioral deviations, neurotic disorders like aggression, violence, intention to suicide, and even psychosis are associated with stimulant drugs.<sup>6</sup> Disturbances in brain function,<sup>7</sup> decrease in the number of serotonin releasing cellules, which affects learning ability and memory power,<sup>8</sup> damage in dopamine releasing cellules, and increasing the likelihood of Parkinson disease<sup>9</sup> have been reported by recent investigations as side effects of Ecstasy use. Young people are more likely inclined to use Ecstasy as a stimulant drug.<sup>2</sup> Unfortunately, some subjective effects of these drugs, including energy peak, body strengthening, sexual arousal, mood elevation, mania, and so forth<sup>6,10</sup> made them more susceptible to misuse it. Recent history proved that knowledge is one of the most effective measures against the use of drugs.<sup>11</sup> Attitude is also an important element in drug abuse. Concerning healthy people, Yacoubian et al in 2003<sup>12</sup> noted that non-Ecstasy users significantly differ from Ecstasy users with regard to belief in the harmful side effects of Ecstasy. Findings from different studies have revealed that Ecstasy is typically viewed as a relatively safe drug with minimal health consequences.<sup>13</sup> There has been a considerable amount of literature concerning drug-related knowledge,<sup>14</sup> attitudes,<sup>15,16</sup> and practice<sup>14,17,18</sup> in other countries. Recently, there have been some investigations in some Middle East countries including Iran regarding this matter as well.<sup>19-22</sup> Therefore the purpose of this study was to obtain a picture of Iranian adolescent girls' knowledge, attitude, and practice (KAP) towards Ecstasy.

**Methods.** A cross-sectional study design was carried out in Tehran University of Medical Sciences

(TUMS), Tehran, the capital city of Iran from October to December 2008. This study was conducted to investigate the following: 1) adolescent girls KAP towards Ecstasy, and 2) correlation between the girls' knowledge-attitude and attitude-practice towards Ecstasy. A cluster random sample of 4116 adolescent girls living in Tehran were selected from 57 public high schools over the city. All participants were 14-18 years old. A written informed consent was obtained from all study participants. Research protocol was approved by the research ethics committee of TUMS. Participants were informed on the anonymity and optional participation in the study. We included in the study only citizens of Tehran that had been studying in Tehran high schools, and excluded those who refused to cooperate.

A 61-item, researcher-made questionnaire was completed anonymously by the study sample. The questionnaire consisted of 4 main domains assessing the following on adolescents': 1) demographic characteristics (14 items), knowledge - this part was developed to assess adolescent girls' knowledge towards Ecstasy in 11 items, 4 "ticked-reply" questions, 7 "true" or "false", and "I don't know" questions; 2) attitude - this part was to evaluate how do adolescents perceive Ecstasy and its harm within 24 items: 23 Likert scale "agree," "disagree," and "no opinion," 1 "yes-no" question; and 3) practice towards Ecstasy - in assessing adolescents practice with regard to Ecstasy through 13 items, "yes," "No," and "I don't know" answers, Appendix 1 shows the questions which were used to assess these variables. Answers in KAP parts were scored separately based on their values. In each part, higher values were specified to healthier answers (for example, a healthier response to an attitude question were graded as higher scores and showed more negative attitude). Sum of the scores in each part were then classified into 3 levels based on 100% which are as follows: 1) knowledge part: high; >75%, moderate; 50-75%, and low; <50%. 2) attitude part: negative; >75%, moderate; 50-75%, and positive; <50%, and 3) practice part: good; >75%, moderate; 50-75%, and poor; <50%. As seen in here, we allocated higher scores to healthier and better KAP.

**Validity and reliability.** In developing the questionnaire, related literature were followed and initial items were derived.<sup>4,11,12,16</sup> Content validity was examined obtaining the questionnaire reviewed by a board of 10 experts in the field of health education and health promotion. All judges were faculty members and had more than 5 years of experience. Minor revisions on face validity were suggested by 7 judges, and sequences of some questions by 5 judges, that was finalized before

\*The full text including Appendix is available in PDF format on Saudi Medical Journal website ([www.smj.org.sa](http://www.smj.org.sa))

the data collection phase. We assessed the reliability of the questionnaire through a test-retest exam on 20 adolescent girls, which had the study samples' characteristics, and internal consistency was met using Chronbach's alpha (70.5%).

In analyzing the data, the Statistical Package for Social Sciences software version 11.5 (SPSS Inc., Chicago, IL, USA) was used. A  $p \leq 0.05$  was considered for interpreting the results. Descriptive statistics were used for describing adolescent's demographics and KAP. Since we converted KAP variables to ordinal variables based on their scores (as mentioned above), Spearman's correlation coefficient test ( $r_s$ ) was used for assessing knowledge-attitude and attitude-practice association.

**Results.** A total of 4116 adolescent girls were enrolled in the study. Most of them (35.3%) were 16 years old (age range from 14-18 years old, mean=15.79, standard deviation=0.956), studying in Human Sciences Department (45.3%), reported to be under the protection and supervision of their parents, and not having a part-time job (96%). Most participants

reported that there is no drug user among their friends (72.3%) and family members (88.3%). Descriptive details on demographic characteristics are presented in Table 1. Most respondents (2881 [70%]) had little knowledge, 799 (19.4%) had moderate knowledge, and a few of them (436 [10.59%]) have good level of knowledge regarding Ecstasy. Most of them (3293 [80%]) had also a positive attitude towards Ecstasy, 494 (12%) has moderate attitude, and a few of them (329 [8%]) negatively perceived the use of ecstasy and its harmful effects. Most participants (2486 [60.4%]) showed a moderate level of practice, 1399 (34%) had weak use of Ecstasy, and some of them (231 [5.6%]) frequently use it. In addition, the study findings revealed a significant relationship between knowledge-attitude ( $r_s=0.445$ ,  $p=0.012$ ), and attitude-practice ( $r_s=0.760$ ,  $p=0.003$ ) with respect to Ecstasy.

**Discussion.** Recent evidence suggests that the use of Ecstasy also known as "club drug" has become progressively more prevalent among adolescents and young adults.<sup>23</sup> If the present trend remains, the problem could become a global one, which affects adversely both the developed and the developing countries. Our results indicated that a high proportion of respondents had low knowledge, positive attitude, and inappropriate practice towards Ecstasy. Gaining the communities' knowledge level toward drugs and their adverse effects is important as it is a basis for people's attitude, and for accurate drug-related policy making.<sup>24</sup> In our study, however, only few participants were fully knowledgeable on the adverse effects of Ecstasy. Although, due to uncertainties on drugs, no one is 'fully knowledgeable' in this area, therefore, educational program for this young group who are evidently at risk would be beneficial. Lack of clarification policies on drugs (such as, educational programs, enough TV programs, available websites, and so forth) including Ecstasy in Iran can be considered as a rationale for such a low knowledge level.

It could be implied from previous investigations that internet information on drugs including Ecstasy could promote knowledge on this drug's potential hazards, and simultaneously provide negative attitudes towards them. Brewer<sup>25</sup> in his investigation on the relation between adolescents' internet searching of club drugs and their knowledge (in drug users and non-users) concluded that searching increases the level of knowledge and decreases risky behavior among non-users of drugs, and reinforced the importance of such information delivery routes for healthy people.

The attitude of the largest percentage of female adolescents towards Ecstasy was positive. Some investigations suggest that Ecstasy is known to be a

**Table 1** - Frequency distribution of adolescent girls' demographic characteristics.

Demographic characteristics	N (%)
<i>Age, years</i>	
14	424 (10.3)
15	890 (21.6)
16	1453 (35.3)
17	671 (16.3)
18	678 (16.5)
Total	4116 (100)
<i>Educational branch</i>	
Mathematic Sciences	1247 (30.3)
BioSciences	1004 (24.4)
Human Sciences	1864 (45.3)
Total	4115 (100)
<i>Parents' supervision (how students perceive their parents supervision)</i>	
Low	1000 (24.3)
High	70 (1.7)
Not at all	3046 (74.0)
Total	4116 (100)
<i>Part-time job</i>	
Yes	62 (1.5)
No	3951 (96.0)
Sometimes	103 (2.5)
Total	4116 (100)
<i>Is there a drug user in your family</i>	
Yes	317 (7.7)
No	3634 (88.3)
I don't know	165 (4.0)
Total	4116 (100)
<i>Is there a drug user among your friends</i>	
Yes	226 (5.5)
No	2976 (72.3)
I don't know	914 (22.2)
Total	4116 (100)

recreational drug, and therefore a harmless one by many ecstasy users, young adults, and general population.<sup>26</sup> This is congruent to de Almedia and Silva's findings in Sao Paulo.<sup>27</sup> Mousavi and Tabatabaee in 2006<sup>28</sup> also showed that 72.1% of men and 79.8% of women in Iran had moderate to positive attitude towards Ecstasy. It could be argued that perhaps presenting Ecstasy as a harmful and dangerous drug has not led to negative attitude towards Ecstasy among this age group according to the participants' responses. This is an important finding, because only a small percentage of participants in our study had negative attitude in this respect, thus there is a need for putting a wide-ranging and specific plan into action in order to prevent them from leaning toward this drug.

On the other hand, investigations of different populations of USA and UK consistently reported desirable knowledge and attitude towards Ecstasy and its harm.<sup>26</sup> Dunn and Thomas<sup>29</sup> also evaluated the knowledge and attitude of a sample of athlete adolescents in Australia, and reported well-established base of knowledge toward cannabis and Ecstasy, and a reasonable attitude toward all drugs. Bagheri and Bahrami in 2003<sup>30</sup> reported that if people were aware of, and believed the undesirable effects of drugs, they may be less likely to take drugs.

Since the advent of Ecstasy is a new phenomenon in Iran, and the respondents in this study are adolescent girls who are naturally less familiar with illegal drugs, gaining such result is not surprising. Our results indicated that a most participants showed moderate level of practice and a few of them had weak level of practice towards Ecstasy. Rabiee and Ghafari<sup>31</sup> found that 15% of female and 12% of male students at the Islamic Azad University in Shahr-e Kord, Iran had used Ecstasy at least once. Furthermore, 12% of female and 30% of male students were offered Ecstasy tablets, and 28% of female and 30% of the male respondents asserted that at least one of their acquaintances had spoken on their experience of taking Ecstasy. In addition, 27% of female and 42% of male students knew where to obtain the drug, and 37% of female and 27% of male respondents had seen and touched Ecstasy.<sup>31</sup> Çorapçiolu et al in 2004<sup>32</sup> investigated 30,467 10th-grade Turkish students' practice towards Ecstasy. They reported that 3.3% of the respondent used Ecstasy at least once in their lifetime. Based on their results, they pointed to the growing nature of inappropriate practice toward Ecstasy among students.<sup>32</sup>

A statistically significant positive relationship was shown between knowledge and attitude of the female adolescents regarding Ecstasy. Therefore, the higher their knowledge, the more negative are their attitude. Jazari et al in 2003<sup>33</sup> reported that one of the preventive

methods is providing knowledge regarding the dangers and harmful effects of illicit drugs bringing forth a change in their attitude from positive to negative towards addiction, addicts, and drugs. Our results also showed that there is a positive and meaningful correlation between the attitude and practice of the informants regarding Ecstasy. In addition, participants who had more negative attitude towards Ecstasy showed a better practice in this regard. Bolhari et al showed that there is a meaningful correlation between adolescents' attitudes, perception of drug use to be wrong, and their practices in Iran.<sup>34</sup> The correlation coefficient between attitudes towards, and practice of drug taking has been, in descending order; 0.72 for alcoholic drinks, 0.53 for cigarettes, 0.31 for cannabis, 0.29 for opium, and 0.16 for Ecstasy. In other words, the more negative attitude towards a given drug, the less likelihood was of using it and vice-versa.<sup>6</sup> Bagheri and Bahrami<sup>30</sup> reported that there is a connection between young peoples' attitudes and beliefs toward drugs. In fact, a more positive attitude toward drugs encourages an earlier deterioration of practice on drugs. Jazari et al<sup>33</sup> quoting the Deputy Head of the Organisation for Preventative Healthcare reported that positive beliefs and attitudes towards drugs can lead to an increase in their use.

We conducted this study based on the assumption of the participants honesty, however, data collection process was carried out in the participants schools (for logistic purposes), and thus, there may be deviations in answers from the true. We assured all participants that they will participate anonymously to minimize this limitation. In addition, we assessed parents' supervision subjectively, and the variable practice towards Ecstasy through a number of written questions, which does not sound that these methods are the best ways for assessing these variables, thus the results regarding these parts should be interpreted more cautiously.

In summary, this study indicated that the KAP towards Ecstasy is not satisfactory in a high percentage of adolescent girls in our study. These findings calls for a need of appropriate interventions in this area for improvement of KAP towards Ecstasy in Iranian girls. We conducted this investigation in the adolescent girls population of Tehran, and developing similar investigations in other cities of Iran within both genders is recommended.

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## References

1. Hoseini S, Fgahihi A. Understanding and investigating factors causing addiction amongst the young people and adolescents. *People's Doctor Monthly* 2005; 38: 55-56.

2. Agar M, Schacht R. Going for the Global: The Case of Ecstasy. *Human Organization* 2003; 62: 1-11.
3. McCann UD, Ricaurte GA, Molliver ME. Ecstasy and serotonin neurotoxicity: new findings raise more questions. *Arch Gen Psychiatry* 2001; 58: 907-908.
4. Hoseinian MH, Farnaghi F, Sarjamee S. The extent of awareness among medical students of Shaheed Beheshti University of Medical Sciences in the case of ecstasy. *Iranian Journal of Legal Medicine* 2005; 11: 128-131.
5. Soltani NK, Ghane T, Behmanesh Y. Ecstasy. Tehran (Iran): Ministry of Health and Medical Education (Division of Food and Medicine); 2006.
6. Parrott AC, Lasky J. Ecstasy (MDMA) effects upon mood and cognition: before, during and after a Saturday night dance. *Psychopharmacology (Berl)* 1998; 139: 261-268.
7. Jacobsen LK, Mendl WE, Pugh KR, Skudlarski P, Krystal JH. Preliminary evidence of hippocampal dysfunction in adolescent MDMA ("ecstasy") users: possible relationship to neurotoxic effects. *Psychopharmacology (Berl)* 2004; 173: 383-390.
8. Kalant H. The pharmacology and toxicology of "ecstasy" (MDMA) and related drugs. *CMAJ* 2001; 165: 917-928.
9. Kish SJ. What is the evidence that Ecstasy (MDMA) can cause Parkinson's disease? *Mov Disord* 2003; 18: 1219-1223.
10. Parrott AC, Milani RM, Parmar R, Turner JD. Recreational ecstasy/MDMA and other drug users from the UK and Italy: psychiatric symptoms and psychobiological problems. *Psychopharmacology (Berl)* 2001; 159: 77-82.
11. Ferrara M, Gentile A, Langiano E, De Vito E, La Torre G, Ricciardi G. Alter Ego. Drug and brain--information to prevent. Compared analysis of opinions, knowledge and habits among a multicentric sample of secondary school students about drug addiction. *J Prev Med Hyg* 2006; 47: 8-11.
12. Yacoubian GS Jr, Boyle C, Harding CA, Loftus EA. It's a rave new world: estimating the prevalence and perceived harm of ecstasy and other drug use among club rave attendees. *J Drug Educ* 2003; 33: 187-196.
13. Bahora M, Sterk CE, Elifson KW. Understanding recreational ecstasy use in the United States: a qualitative inquiry. *Int J Drug Policy* 2009; 20: 62-69.
14. Tang YL, Wiste A, Mao PX, Hou YZ. Attitudes, knowledge, and perceptions of Chinese doctors toward drug abuse. *J Subst Abuse Treat* 2005; 29: 215-220.
15. Sagy S, Shani E, Leibovich E. Factors related to attitudes towards drug abuse and alcohol drinking: Comparing immigrants from the Former Soviet Union and Israeli-born adolescents. *Journal of Substance Use* 2008; 14 : 10-18.
16. Orbell S, Blair C, Sherlock K, Conner M. The theory of planned behavior and ecstasy use: Roles for habit and perceived control over taking versus obtaining substances. *Journal of Applied Social Psychology* 2001; 31: 31-47.
17. Klitzman RL, Greenberg JD, Pollack LM, and Dolezal C. MDMA ('ecstasy') use, and its association with high risk behaviors, mental health, and other factors among gay/bisexual men in New York City. *Drug and Alcohol Dependence* 2002; 66: 115-125.
18. von Sydow K, Lieb R, Pfister H, Höfler M, Wittchen HU. Use, abuse and dependence of ecstasy and related drugs in adolescents and young adults-a transient phenomenon? Results from a longitudinal community study. *Drug Alcohol Depend* 2002; 66: 147-159.
19. Ilhan IO, Yildirim F, Demirbaş H, Doğan YB. Prevalence and sociodemographic correlates of substance use in a university-student sample in Turkey. *Int J Public Health* 2009; 54: 40-44.
20. Hekmat M. The students' relationship between knowledge and attitude about using ecstasy in public female's pre-university centers of zone 17 in Tehran city in the year 2007-2008. *Middle East Journal of Nursing* 2009; 3 : 147-159.
21. Dabiran S, Khosravi S, Hatmi ZN, Sheikhsavan M. Iranian school teachers: knowledge and attitude toward ecstasy. *Int J Adolesc Med Health* 2009; 21: 175-178.
22. Yekkehfallah L, Momeni A, Torkashvand A, Jahani HH. [Factors Associated with Ecstasy Use in Students of Qazvin University of Medical Sciences] *Hayat* 2009; 15: 93-101.
23. Boyd CJ, McCabe SE, and d'Arcy H. Ecstasy use among college undergraduates: gender, race and sexual identity. *J Subst Abuse Treat* 2003; 24: 209-215.
24. Bryan A, Moran R, Farrell E, and O'Brien M. Drug-Related Knowledge, Attitudes and Beliefs in Ireland: Report of a Nation-Wide Survey. Dublin (Germany): The Health Research Board; 2000. p. 104. Report No: 0-9517193-8-6.
25. Brewer NT. The relation of Internet searching to club drug knowledge and attitudes. *Psychology & Health* 2003; 18: 387-401.
26. Gamma A, Jerome L, Liechti ME, Sumnall HR. Is ecstasy perceived to be safe? A critical survey. *Drug Alcohol Depend* 2005; 77: 185-193.
27. de Almeida SP, Silva MT. Ecstasy (MDMA): effects and patterns of use reported by users in São Paulo. *Rev Bras Psiquiatr* 2003; 25: 11-17.
28. Mausavi F, Tabatabaee R. An Investigation of the Knowledge, Attitude and Practice of Youths in Tehran relating to Ecstasy. *Social Welfare Summer* 2006; 5: 293-306.
29. Dunn M, Thomas JO. Attitudes toward, knowledge of, and prevalence of recreational drug use among elite Australian athletes. *EDRS Drug Trends Bulletin*. [accessed 2010 April]. Sydney: National Drug and Alcohol Research Centre, University of New South Wales. Available from URL: [http://www.med.unsw.edu.au/NDARCWeb.nsf/resources/EDRS+Bulletin+April09.pdf/\\$file/EDRS+bulletin+April10.pdf](http://www.med.unsw.edu.au/NDARCWeb.nsf/resources/EDRS+Bulletin+April09.pdf/$file/EDRS+bulletin+April10.pdf)
30. Bagheri M, Bahrami EH. The Impact of Life Skills Training upon Pupils' Knowledge and Attitude regarding Drugs and Self-Respect. *Scient-Res Quart Substance Abuse* 2003; 3: 149-172.
31. Rabiee M, Ghafari GA, editors. An Investigation of the Students' Experiences relating to Ecstasy Tablets amongst the Students of the Islamic Azad University in Shahr-e Kord. Proceedings of the National Ecstasy Conference; 2006 May 6-10; Astara (Iran). Astara (Iran): Islamic Azad University Astara; 2006. p. 1561-5.
32. Corapçioğlu A, Ogel K. Factors associated with Ecstasy use in Turkish students. *Addiction* 2004; 99: 67-76.
33. Jazeri A, Rafiee H, Nazari M. Attitudes of 11-13 Year-Old Pupils in Tehran towards Addiction. *Social Welfare Quarterly* 2003; 7: 217-229.
34. Bolhari J, Taremiyan F, Peirovi H, Ghazi TM. Prevalence of drug abuse in university students of Tehran. *Iranian Journal of Psychology and Psychiatry* 2007; 13: 335-342. Persian.