Since past several decades, the use of psychotropic substances is considered an important issue with significant morbidity and mortality. A psychotropic drug can be defined as any drug capable of affecting the mind, emotions, and behavior. Globally, there are various types of psychotropic drugs or substances used. In this review, most commonly used psychotropic substances are categorized within three classes such as benzodiazepines, stimulants, and opiates. The second and third class are cannabis and cocaine and alcohol, tobacco, and kola nut, respectively.

The trend of using psychotropic substances is increased gradually. Therefore, a mere thoughtfulness of the contributory

ADDRESS FOR CORRESPONDENCE:
Dr. Mohammad Jamshed Ahmad Siddiqui, E-mail: jamshed_siddiqui@iium.edu.my

Received : 28-12-14
Review completed : 18-02-15
Accepted : 21-04-15

KEY WORDS: Psychotropic, students, misuse, prevalence
factors toward the psychotropic use, their prevalence, and the misuse is the gist of the current review.

**Methods**

A literature search was performed during the period of September 2012 to October 2013 to identify published studies related to the use of psychotropic medications among students. The articles which emphasized on the usage, prevalence, gender differences, associating factors, and misuse of psychotropic medications were included. Studies not encompassing students and had respondents >30 years of age were fitted into the exclusion criterion. The retrieved literature was abstracted using a standardized data abstraction form in

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Method</th>
<th>Setting</th>
<th>Number of participant</th>
<th>Outcomes</th>
<th>Limitation highlighted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rates and prevalence Soldera et al. 2003</td>
<td>Brazil</td>
<td>Self-administered questionnaire</td>
<td>School</td>
<td>2287</td>
<td>Heavy use of legal and illegal drug was found as follow: Alcohol (11.9%), tobacco (11.7%), marijuana (4.4%), solvents (1.8%), cocaine (1.4%), medication (1.1%), and ecstasy (0.7%)</td>
<td>No limitation highlighted by the authors</td>
</tr>
<tr>
<td>Lambert et al. 2006</td>
<td>Brazil</td>
<td>Questionnaire</td>
<td>University</td>
<td>1054</td>
<td>Male students had a higher prevalence of alcohol abuse, alcohol LTD use, tobacco, cannabis, and inhalant lifetime use. Tranquilizers are common in female medical students</td>
<td>The limitation inclusive of recall bias, reporting errors, and potential sample bias of unknown quantity</td>
</tr>
<tr>
<td>Ryan et al. 2008</td>
<td>USA</td>
<td>Medication record’s review</td>
<td>Residential facilities</td>
<td>137</td>
<td>Medication rates varied from 65%-94% with an overall medication rate of 76% of all the students placed in the residential care</td>
<td>The sample is inadequate to represent the population as the sampling method is only based on convenience sample</td>
</tr>
<tr>
<td>Rosvold 2008</td>
<td>Norway</td>
<td>Self-completion questionnaire</td>
<td>University</td>
<td>604 (67% female)</td>
<td>Altogether 2% males and 6% females were using one or more of the three psychotropic listed (antidepressants being the larger group</td>
<td>Low response rate dictates the caution interpretation of the results</td>
</tr>
<tr>
<td>Azaiza et al. 2008</td>
<td>Israel</td>
<td>Self-report questionnaire</td>
<td>School</td>
<td>2994</td>
<td>Significant difference was found among gender. Higher rates of usage among the students with 14% of the participants were reported to having used tobacco in the past year, 17% admitted that they had consumed more than one type of alcoholic beverages. The rates for all type of illegal use were 12%, 8% for using medication for nonmedicinal use while 6% used cannabis and 9% used other type of illegal drugs</td>
<td>Limitation highlighted inclusive of difficulty in understanding certain questions, lack of knowledge and misrepresented the actual substances used</td>
</tr>
<tr>
<td>Stolberg et al. 2009</td>
<td>USA</td>
<td>Questionnaire</td>
<td>College</td>
<td>742</td>
<td>There is no significant difference between genders in consuming lifetime substance used except for opiates</td>
<td>Repetition of the research is suggested by the authors. Methodological limitation is highlighted</td>
</tr>
<tr>
<td>Chen et al. 2009</td>
<td>China</td>
<td>Self-administered questionnaire</td>
<td>School</td>
<td>18,232 (in 2004), 17,986 (in 2005), 17,864 (in 2006)</td>
<td>Ecstasy and ketamine are the most commonly used</td>
<td>Change in the mode of administration from paper to web-based questionnaire limit the previous data collection</td>
</tr>
<tr>
<td>Abdulmalik et al. 2009</td>
<td>Nigeria</td>
<td>Questionnaire and interview</td>
<td>Streets</td>
<td>340</td>
<td>The prevalence of psychoactive substance used was 66.2% among Almajiris. The most Common substance used were stimulant, volatile solvents, cigarettes, and cannabis</td>
<td>Limitation is not mentioned by authors</td>
</tr>
<tr>
<td>Redhwan et al. 2010</td>
<td>Malaysia</td>
<td>Questionnaire</td>
<td>University</td>
<td>200</td>
<td>The prevalence of using sleeping pills among university students is 7.5%. There is significant relationship between using sleeping pills and depression as well as in inducing sleep by reading 14 substances investigated. The life prevalence of use of any of them is 61.8% and the use in past year of 32.1%</td>
<td>There is no limitation highlighted by the author</td>
</tr>
<tr>
<td>Famimuya et al. 2011</td>
<td>Nigeria</td>
<td>Self-report questionnaire</td>
<td>School</td>
<td>4286</td>
<td></td>
<td>Under-reporting may occur due to the fear of reprimand and the problem of recall of past event</td>
</tr>
</tbody>
</table>
Mamat, et al.: Psychotropic substances and students

Table 1: Contd...

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Method</th>
<th>Setting</th>
<th>Number of participant</th>
<th>Outcomes</th>
<th>Limitation highlighted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors associate in the usage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carroll et al. 2006</td>
<td>USA</td>
<td>Survey</td>
<td>College</td>
<td>347 (61.3% female)</td>
<td>The efficacy of the stimulant in helping one to study longer, study better, stay awake and lose weight was endorsed most strongly by nonprescription users</td>
<td>There might be sex selection bias</td>
</tr>
<tr>
<td>Chau et al. 2008</td>
<td>France</td>
<td>Questionnaire</td>
<td>Widespread</td>
<td>1257</td>
<td>Use of psychotropic drugs was common (33.2%) with more young adult female precedes the number of male in the usage of psychotropic medication in relation to their profession and other factors</td>
<td>The psychotropic drug considered included those for fatigue, nervousness, anxiety, and/or insomnia</td>
</tr>
<tr>
<td>Patrick et al. 2012</td>
<td>Germany</td>
<td>Web-based Questionnaire</td>
<td>University</td>
<td>1324</td>
<td>The usage of psychotropic substance as neuroenhancer that works to increase the concentration, increased vigilance, and enhanced cognitive function</td>
<td>The web-based questionnaires make it impossible to determine the exact response rate and the generalizability of the samples is limited</td>
</tr>
</tbody>
</table>

Misuse of the psychotropic drug

<table>
<thead>
<tr>
<th>Study</th>
<th>Country</th>
<th>Method</th>
<th>Setting</th>
<th>Number of participant</th>
<th>Outcomes</th>
<th>Limitation highlighted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quintero et al. 2006</td>
<td>USA</td>
<td>Interview</td>
<td>College</td>
<td>52</td>
<td>Benzodiazepines (e.g., Diazepam, alprazolam) and stimulants (e.g., Methylphenidate) medication are widely misused</td>
<td>The generalizability of the population is limited due to smaller sample size</td>
</tr>
<tr>
<td>Stone et al. 2011</td>
<td>USA</td>
<td>Self-reported questionnaire</td>
<td>University</td>
<td>383 (59.2% female)</td>
<td>Higher rates of psychiatric medication misuse for example benzodiazepine and stimulants, when compared to rates of medical use. There is not significant prevalence of drug misuse between genders</td>
<td>The use of convenience samples may limit the generalizability</td>
</tr>
<tr>
<td>Ghandour et al. 2012</td>
<td>Lebanon</td>
<td>Self-reported questionnaire</td>
<td>University</td>
<td>570</td>
<td>Medical and nonmedical lifetime usage rate were pain (36.9%, 15.1%), anxiety (8.3%, 4.6%), sleeping (6.5%, 5.8%), and stimulants (2.6, 3.5%)</td>
<td>No limitation is highlighted by the authors</td>
</tr>
</tbody>
</table>

Figure 1: Quorum flow chart of the review process

Search strategy

The search strategy involved using Boolean operators for the combination of following terms: Psychotropic, drugs, medicines, medication misuse, and students. The search was limited to full paper articles published in English from 1998 to October 2013.

Search engine

Electronic databases included in the search were EBSCOhost, Science Direct, Springer Link, Proquest, CINAHL Plus with Full Text, and Google Scholar. Identified studies were...
arranged chronologically starting from the 2003 to 2013 [Figure 1].

Search objectives

The three main objectives of this review were prevalence the usage of psychotropic medications by examining the trend of use, factors associated with the usage of psychotropic substances, and as well as the misuse of any psychotropic drugs.

Results

From 45 titles and abstracts which were identified from the above-mentioned databases, only 16 titles were used in this literature review. The other 28 titles and abstracts did not meet the objectives of this review. Only one is excluded for having <20 numbers of respondents. For all the 16 titles full texts were retrieved and divided into three categories, that is, the usage prevalence and rate, associated factors, and the misuse of psychotropic drugs.

The rates and prevalence of the usage of psychotropics

According to Stone and Merlo, there are higher rates of psychiatric medication misuse when compared to the rates of medical use.[9] Saddock and Saddock reported that illicit substance use in the youth population is more prevalent than any other age groups in the society.[5] In Malaysia, the usage of psychotropic drugs is increased mainly due to western influence, rapid urbanization, and industrial exposure parallel with the rapid progression of the Malaysia from a developing nation to a transitional economy.[6] In this cross-sectional study, of 200 Malaysian university students, the prevalence of using sleeping pills was found to be high.[6]

Soldera et al. studied the prevalence and associated social factors among the high school students of both the public and private schools.[11] The study was done on 2287 elementary and high school students. There were some factors identified as protectors and facilitators. Religious knowledge during childhood was identified as protector whereas facilitating factors promoting heavy use of legal and illegal drugs were financial assets, socialization patterns with friends, and deteriorated family environment.[7] On the contrary, Lambert and his associates focused their study on the prevalence of psychoactive drug use among the medical students. It was a cross-sectional study design with a final sample of 1,054 medical students which reported the usage prevalence and rate, associated factors, and the misuse of psychotropic drugs (n = 39, 28.5%), and last but not the least the stimulants were prescribed (n = 18, 28.5%).[8]

Rosvold conducted a survey in one of the universities in Norway, which aimed to analyze the medicine usage in general. In a survey executed with 604 students under the age of 30 years old, it was found that the usage of psychotropic drugs was still one of the favorite drug categories consumed by females, most likely because female students were found to be more stressed.[10]

A study conducted by Azaiza et al. in the Israel region in 2008 used self-reported questionnaires as a tool to collect the pattern of usage of psychotropic substances among Arab secondary school students. In a sample of 2944 students, 14% of the participants reported to have used tobacco in the past year whereas 17% admitted that they had consumed more than one type of alcoholic beverages. The rate for all types of illegal uses was 12%. More male students were identified to use psychoactive substances than their female counterparts; that is, in the use of cigarette and cannabis.[9]

Three included studies executed in the year 2009 from USA, Taiwan, and Nigeria reported alcohol, tobacco, marijuana, cocaine, relaxants, amphetamines, barbiturates, and opiates categories.[10] Stolberg in an African-American based study reported that regardless of gender more than three-fourth of the respondents reported to “ever use any of the drugs” on the other hand, Chen et al. studied about the use of ecstasy and other psychoactive substances among the adolescents in Taiwan. In this national survey that was done consecutively from 2004 to 2006 with the involvement of a bigger sample; that is, 18,232 students in 2004, 17,986 in 2005, and 17,864 in 2006 Ecstasy and ketamine appeared the most commonly used illegal drugs. Majority of the ecstasy users were involved in poly-drug usage.[10] For Nigeria, the study was done by focusing on the Almajiri group of students. Almajiri are children that were sent away at an early age by their parents to get religious knowledge from their teachers. They live together with their friends independently. Living a life of street children, usually these students were asked to beg in the street and do some menial jobs such as cleaning people shoes, selling paper, and others to support their daily needs. A cross-sectional survey was conducted with the involvement of 340 Almajiri male students. The prevalence of the drug use was 66.2%, and the most common substances used were stimulants, volatile solvents, cigarettes, and cannabis[12] highlighting the high usage of the psychotropic drug among teenage students.

Studies on the use of psychotropic drugs in Malaysia are limited. In the current review, one study was retrieved which emphasized on the prevalence of the sleeping pill use among students. With a 200 sample size study at the Management and Science University, Malaysia it reported the prevalence of sleeping pill use of about 7.5%.[8] A significant relationship was reported between sleeping pills to depression as well as their usage to induce sleeping by reading.

In one of the Nigerian studies by Famuyiwa et al. their focus was on adolescents of the metropolitan Lagos, Nigeria. A total of 4286 school pupils were assessed for the use of 14 types of psychotropic drugs. For all of them, the lifetime prevalence was found out to
be 61.8% and the use in the past 1 year was 32.2%. The most common or highest used drug both in “lifetime prevalence” and in the “past year prevalence” was mild stimulants which were coffee (61.8%), kola nut (42.6%), and alcohol (32.2%).  

**Contributory factors toward the usage**

Carroll et al. studied the pattern and knowledge of the nonmedical use of stimulants among college students majoring in arts. A sample of 347 undergraduates was recruited to assess their knowledge on the “stimulant use.” More than half of the total students had peers who used nonpersion stimulants. Interestingly, there were students visiting the physicians to get the medication for ADHD, although they did not have the disease. More than half of the respondents knew people who sold stimulants to students.  

Chau et al. published a study in 2008, to identify the factors contributing to the usage of these drugs. The study was conducted on a sample of 1257 people aged 18–29 randomly selected in North-Eastern France by means of a postal survey. The disparity in socioeconomic status imparts great influences in this matter. Interestingly, it was found out that housewives and students are at higher risk for psychotropic drug use than an unemployed young adult. Other stressors such as financial problem among students and academic pressures and their consequences on the social life also contribute to the high possibility of using psychotropic medications.  

A study by Eickenhorst et al. in 2012 also reported that the leading motives of German university students was to use any class of psychotropic drugs for a neuro-enhancement effect, thereby expecting to improve concentration. In this web-based survey of 1324 undergraduate and postgraduate students large academic workload and the management of the high level of stress were found to be primary motivators of practicing neuro-enhancement. These findings are in parallel with many previously published studies. Other potential motives were increased vigilance followed by enhanced cognitive performance. A large percentage of respondents reported that the use of psychotropic drugs improve the concentration.

**Misuse of the psychotropic drug from prescription**

Many a times, it is necessary for the physician to prescribe the psychiatric medications as a treatment for students and often these then further misused and abused especially in the college campus. It is estimated that for every three students taking the prescribed psychotropic medication, one of them will divert the actual usage of the medication for their own purposes.  

Quintero et al. studied the prescription drug misuse among the college students and reported out that from a total of 235 lifetime episodes of misuses, 56 different prescription drugs approximately equals to the five episode of prescription misuse per respondent. In this study, 52 college students at a public university in US were interviewed. From the findings, the psychotropic drugs were found out to be most commonly and widely misused. It included opioid analgesic, benzodiazepine such as diazepam, alprazolam, and also stimulants like methylphenidate. Most of the students got the drugs from the prescription that the physician prescribes to them.  

Stone and Merlo in 2011 reported about the misuse of psychotropic medication in college students which resulted in high rates of drug misuse compared to rates of medical use. This study represented a sample of 383 students recruited on campus or via an online class of different ethnicities and background. In other words, the sample was reflective of overall students’ population. The same pattern of usage was also seen in a study in one of the universities in Lebanon in which they found out the rate of nonmedical is half of the actual activity of the drug as psychotherapeutics. Medical and nonmedical lifetime usage rates were pain, anxiety, insomnia, and stimulants. Chandour et al. reported that 1 out of 5 person (20%) will divert the actual usage of the medication to their intended purposes such as help in sleeping or increasing alertness. The higher rate of misuse was observed more following the lifetime marijuana users and alcohol abusers.

**Discussion**

Of all the articles reviewed, it can be summed up that the higher prevalence use of any psychotropic substance is alcohol usage. This is commonly shared by most of the previously published studies which do not only focus on just one type of psychotropic substance. The overall percentage of alcohol consumption is always more than 10% from the total percentage of all the substances tested. This is not a surprising outcome since alcohol is one of the socially-acceptable psychotropic substance worldwide. There are three studies in the current review that contravenes to each other from the gender perspectives. Females are found to use more psychotropic drugs in a sense to fight their depression as compared to male students. This happens because of the mental stresses that usually occur to female, and they are more open to share with the physician or psychiatrist regarding their condition or problem. The ratio of psychotropic drug use among female to male is approximately 2:1 as shown in cross sectional studies that supported this basis. Most of them related to the usage of prescribed psychotropic drugs. From another perspective, male students are found to be at the higher prevalence of the cannabis and tobacco and alcohol use. It is reported that more males consume tobacco (30.2% vs. 21.9%) and alcohol abuse (12.5% vs. 3.3%) rather than females. This is presumably due to the fact that the tobacco usage is extensive and is seen as one of the common habits in male, contributing to project their image of masculinity. On the contrary to both studies before, Stolberg did not find any difference of the usage of psychotropic substances in relation to gender.

In general, there are many factors that contribute to the usage of the psychotropic medication. One of them is the usage related to the performance in studying processes. More students use the psychotropic drug in the form of stimulants in order to increase the concentration in learning as well as to have a longer period of studying by staying awake and improvised academic performance and make them more relaxed.
Stress is also one of the factors that contribute to psychotropic drug taking behavior.[23] The elevation in the psychological distress is reported to be higher among university students as compared to the general population norm.[24] For example, a study done on the medical student in southern Brazil stated that the crescent workload in academic life tends to put the student in more distressful situations and thus predisposing them to the consumption of psychotropic drugs.[21]

Other than that the usage of the psychotropic drugs is also increased due to environmental and social factors. Students that come from the unsuccessful family institutions are more prone to consume psychotropic drugs.[11] Both study from Chau et al. and Azaiza et al. supported this theory and highlighted the significant role of the family in modeling good children. Students that have a strong relationship with their parents and feel at ease with their family and friends are found out to be more protected against the usage of the drug.[7,23] Moreover, their obedience and respect toward their parents make them become aware of their responsibilities and prevent them from taking these type of habit-forming or addictive drugs.

In terms of individual religiosity, there is the low prevalence of usage among those students who had strong beliefs in their religions or the existence of GOD even when they had easy access to different psychotropic substances.[12] On the other hand, a higher rate of psychotropic substance usage is associated with the students with low religiosity.[19] Religiosity does not account only for Muslims such as in the case of “Almajiri” student but also for those who present to church regularly.[23]

The misuse of the psychotropic substance is also higher among the college students. Despite not having any problems or diseases related to the usage of psychotropic drugs, students still seek the physician; although they believed that they have no such diseases like ADHD.[14] McCabe et al. categorized this misuse as nonmedical usage of the drug and students often misuse this type of psychotropic substance due to their easy availability of the drugs or either getting from peers and family members with legitimate prescription.[23]

**Conclusion**

Globally, the usage of psychotropic drugs is evolving gradually. There is increased need of awareness on the psychotropic substances usage or consumption among the community. Awareness regarding its side effects, habit forming and/or addictive property and as well as interaction with other drugs need to be done especially among teenage and students. Moreover, it is pertinent that the enforcement policies regarding psychotropic substances might be improved to fulfill any loopholes in the regulation.

Last but not the least, there are some limitations in this review. This study does not really reflect the overall prevalence of use of the psychotropic drug for the whole population. This is due to the fact that different countries may practice difference types of regulation in drug prescription.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

20. Stolberg VB. Lack of gender differences in lifetime substance use reported among African-American urban community college
Mamat, et al.


Author Help: Online submission of the manuscripts

Articles can be submitted online from http://www.journalonweb.com. For online submission, the articles should be prepared in two files (first page file and article file). Images should be submitted separately.

1) **First Page File:**
   Prepare the title page, covering letter, acknowledgement etc. using a word processor program. All information related to your identity should be included here. Use text/rtf/doc/pdf files. Do not zip the files.

2) **Article File:**
   The main text of the article, beginning with the Abstract to References (including tables) should be in this file. Do not include any information (such as acknowledgement, your names in page headers etc.) in this file. Use text/rtf/doc/pdf files. Do not zip the files. Limit the file size to 1 MB. Do not incorporate images in the file. If file size is large, graphs can be submitted separately as images, without their being incorporated in the article file. This will reduce the size of the file.

3) **Images:**
   Submit good quality color images. Each image should be less than 4096 kb (4 MB) in size. The size of the image can be reduced by decreasing the actual height and width of the images (keep up to about 6 inches and up to about 1800 x 1200 pixels). JPEG is the most suitable file format. The image quality should be good enough to judge the scientific value of the image. For the purpose of printing, always retain a good quality, high resolution image. This high resolution image should be sent to the editorial office at the time of sending a revised article.

4) **Legends:**
   Legends for the figures/images should be included at the end of the article file.