

BIBLIOGRAPHIC INFORMATION SYSTEM

Journal Full Title: Journal of Biomedical Research & Environmental Sciences

Journal NLM Abbreviation: J Biomed Res Environ Sci

Journal Website Link: <https://www.jelsciences.com>

Journal ISSN: 2766-2276

Category: Multidisciplinary

Subject Areas: Medicine Group, Biology Group, General, Environmental Sciences

Topics Summation: 128

Issue Regularity: Monthly

Review Process type: Double Blind

Time to Publication: 7-14 Days

Indexing catalog: [Visit here](#)

Publication fee catalog: [Visit here](#)

DOI: 10.37871 ([CrossRef](#))

Plagiarism detection software: [iThenticate](#)

Managing entity: USA

Language: English

Research work collecting capability: Worldwide


Organized by: [SciRes Literature LLC](#)

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REVIEW ARTICLE

A Systematic Review of Intravenous Psychoactive Drug Use among Adolescent Females

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ABSTRACT

Background: In the twenty-first century, female adolescents' use of intravenous psychoactive substances has become widespread worldwide. For instance, statistics show that 155 and 250 million people between the ages of 15-64 used intravenous psychoactive drugs as of 2008. Examples of intravenous psychoactive drugs taken by people with 15-64 include; Amphetamines, non-prescribed psychoactive prescription drugs, cannabis, cocaine, and opiates. As a result of the preceding, the use of intravenous psychoactive drugs among Female adolescents is a common phenomenon in the 21st century.

Aim: To undergo a systematic review on IV psychoactive drugs use, prevalence, causes and effects among adolescent females.

Design: A systematic review.

Data Sources: Systematic search for worldwide published literature from databases like google scholar, Emerald, PubMed, and science-direct.

Study Eligibility Criteria: Articles that are published in English, primary research and studies published within the last 10 (ten) years (2013-2023).

Results: From the 2000 published papers that was found, 1700 publications were screened out owing to duplicate data. In addition, 60 publications were eliminated because they did not have appropriate information for this current study, and 200 papers were eliminated because of erroneous information. For being overly shallow, 29 publications were ignored. In the end, this study included 11 (eleven) publications.

Conclusion: Worldwide, there is a high prevalence of female adolescents using intravenous psychoactive drugs. The causes include feelings of helplessness following family separation, poor academic performance, a physical environment, prior substance use, recreational alternatives, socialisation issues, and inadequate organisational support. Cardiovascular illness, psychological diseases like anxiety, dependency, mood, and psychosis disorders, as well as various Hormonal Contraceptives, are all consequences of intravenous psychoactive drug use among female teenagers (HC). According to this study, more Motivational Enhancement Therapy (MET), family counselling, and cognitive-behavioural therapy should be used to free female adolescents from the shackles of intravenous psychoactive substance use.

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DOI: 10.37871/jbres1679

Submitted: 01 February 2023

Accepted: 02 March 2023

Published: 07 March 2023

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OPEN ACCESS

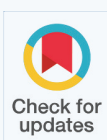
Keywords

- > Intravenous
- > Psychoactive
- > Drugs
- > Female
- > Adolescents

MEDICINE GROUP

PHARMACOLOGY

VOLUME: 4 ISSUE: 3 - MARCH, 2023



How to cite this article: Nkporbu AK, Metu I, Stanley PC. A Systematic Review of Intravenous Psychoactive Drug Use among Adolescent Females. 2023 Mar 07; 4(3): 321-330. doi: 10.37871/jbres1679, Article ID: JGRES1679, Available at: <https://www.jelsciences.com/articles/jbres1679.pdf>

Introduction

In the twenty-first century, female adolescents' use of intravenous psychoactive substances has become widespread worldwide. First of all, "intravenous" and "psychoactive medications" are the essential words here." Some authors defined a psychoactive drug as a drug or other substance that affects how the brain works and causes changes in awareness, feelings, mood, behavior or thoughts [1,2]. Other authors asserted that psychoactive drugs are compounds that, when consumed or injected into a person's system, affect such persons thinking, feelings, cognition, consciousness, mood, and perception [3,4]. The fact that psychoactive drugs impact the brain resulting in changes in thoughts, mood, consciousness, and behaviour, can be revealed in light of what numerous authors have said about what these intravenous psychoactive drugs are.

It is worth noting that psychoactive drugs are divided into many groups based on how they affect a person [5]. These groups consist of: "depressants," which are medications that induce sleep, calm the brain, and promote relaxation. Additionally, Depressant medications can also result in anger, anxiety, and nightmares [6]. The "Stimulants" are the second class of psychoactive medications; they promote alertness, wakefulness, and vigour [7]. In addition, "Opiates" psychoactive medicines are narcotic painkillers that heighten joy or euphoria and have a sedative effect [8]. Conclusively, the "Hallucinogens", are psychoactive medications that create hallucinations in which a user may perceive or hear things that are not there [9].

Notably, while intravenous drug use involves injecting a substance into a vein using a syringe [10], the intravenous route of delivery of psychoactive substances results in immediate and intensified effects [11]. This is because intravenous psychoactive substances injected via the intravenous route bypass the first-pass metabolism that all orally delivered medicines do. As a result, injecting medicine through the intravenous route enables quick bloodstream entry, accelerating transport to the brain [12]. Without a doubt, the effects of such drugs frequently start to take effect within a minute of the drug injection [12].

This study investigates the prevalence, reasons behind, causes for, and effects of intravenous psychoactive drug use in female adolescents. It is apparent to understand that adolescence is imperial because it is linked to the adolescent years and serves

as a stage of life that cannot be overemphasised. The preceding is true because adolescence signifies the transition from childhood to adulthood and is accompanied by social, physical, and psychological changes [13]. According to statistics, an adolescent is anyone between the ages of 10 and 19 [14]. The fact that adolescents make up more than a fifth of the world's population is also important to note [15].

The fact that the use of psychoactive drugs is rampant among female adolescents far before birth is the aim of this study. For instance, as far back as 2008, between 155 and 250 million people in the globe between the ages of 15 and 64, used intravenous psychoactive substances [16]. Amphetamines, non-prescribed psychoactive pharmaceutical medications, cannabis, cocaine, and opioids are a few examples of the intravenous psychoactive drugs that this category of people takes. Furthermore, research has it that 129-190 million people have used psychoactive drugs such as cocaine and opioids. This makes cocaine and opioids the most used intravenous psychoactive drugs globally followed by amphetamine-type stimulants, cannabis, and subsequently [17].

Psychoactive substance abuse seriously impacts a person's health and the individuals in their family and community. For instance, the World Health Organization (WHO) estimated that cocaine and opioid usage contributed 0.7% to the worldwide illness burden in 2004 and that the social cost of illegal drug use accounted for around 2% of GDP in those nations with higher health burden. Additionally, whereas each individual in the world who is 15 years of age or older consumes 6.2 litres of pure alcohol per year on average [18], only 38.3% of people consume alcohol [19]. This indicates that each year, the average drinker consumes 17 liters of pure alcohol. Therefore, 148 countries have stated that at least 15.3 million people use drugs, and 120 reports that this group has chronic health challenges [20].

Conflict in the home, low parental involvement in the child's schooling, and drug use by friends, neighbours, and parents were all major risk factors for teenagers using intravenous psychoactive substances [21]. Additionally, parental drinking, death before age 18, and divorce before age 18 increase the likelihood that a child may consume psychoactive substances [22]. Furthermore, a person's behavior as a young adult is influenced by the socioeconomic milieu in which they were raised as youngsters and this can make adolescents indulge in taking psychoactive drugs [23]. Therefore, understanding this link

is a crucial first step in identifying those at risk. Measuring how socioeconomic factors affect young people's attitudes and behaviors toward psychoactive substances is crucial for identifying the risk factors and protective factors linked to young people abusing psychoactive substances.

Methods

Literature searches

The eleven papers used in this research are included in figure 1, along with a description of how the author of this research has chosen them. The appendix also included information on the number of articles excluded at various times and the justifications for those exclusions.

In this study, the terms “the use of intravenous psychoactive drugs among female adolescents,” “the prevalence of intravenous psychoactive drugs among female adolescents,” “causes of intravenous psychoactive drugs use among female adolescents,” and “the effect of intravenous psychoactive drugs on female adolescents” were all used in the search strategy. About 2000 published articles were found out when the search terms were applied to databases, including Google Scholar, Emerald, PubMed, and Science Direct.

1000 publications out of 2000 were discarded

owing to duplicate data and other issues with the publications, including the articles needing to be peer-reviewed. Additionally, 700 of the remaining 1000 articles were excluded and excommunicated because accessing them from the original databases used for the searches on intravenous psychoactive use among female teenagers required paying a fee. The above implies that just 300 freely available publications are available for the research to evaluate for eligibility.

However, the removal of 200 papers due to erroneous information and another 60 due to their ineligibility for the current study came as a result of additional quality assessment. Furthermore, 29 publications from the previously acquired list were ignored because they were too superficial and lacked the data necessary to address the study's research objectives. Following a comprehensive search and screening to ensure the study's goals and objectives were maintained, 11 (eleven) papers were eventually included in this review.

Notably, great care was taken to ensure that the publications discovered met the inclusion requirements for this study when searching for them with the search items urged in this study. The researcher first made sure that all of the articles chosen for this study covered topics like “the use of intravenous psychoactive drugs among female

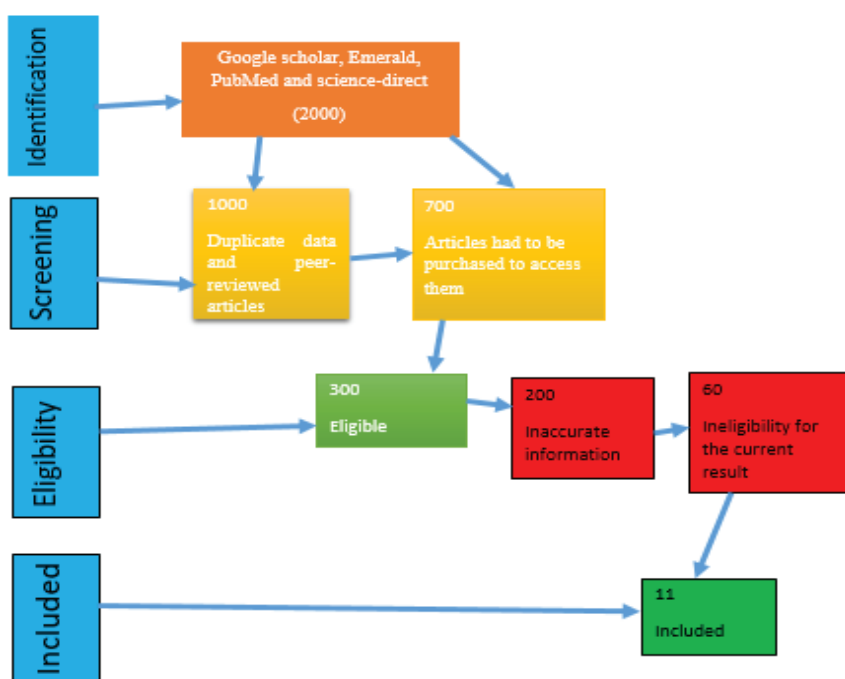


Figure 1 The PRISMA flow diagram for the study (Source: Authors computation, 2022).

adolescents,” “the prevalence of intravenous psychoactive drugs among female adolescents,” “causes of intravenous psychoactive drug use among female adolescents,” and “the effect of intravenous psychoactive drugs on female adolescents.” Additionally, the researcher ensured that all the articles used were systematic reviews and peer-reviewed works. Because English is the official language of the researcher’s institution, the writers ensured that all the articles were published in English. Additionally, publications containing quantitative and qualitative analysis and research that were only published during the past ten years are included in the inclusion criteria for these investigations (2013–2023).

Quality assessment

Eight quality criteria were used to evaluate the quality of the published articles included in this research. These eight quality criteria include; (1) Reliable, repeatable case definition (2) Appropriate sampling technique (e.g., random, cluster) (3) the target population must be specified (4) confidence intervals or standard errors must be reported (5) measuring with an appropriate tool (6) Makes an effort to lessen observer bias Both the sample size (> 300 individuals) and response rate (> 66%) is sufficient in the study data. The “prevalence of intravenous psychoactive drug use among female adolescents,” “causes of female adolescents’ use of intravenous psychoactive drugs,” and “impact of intravenous psychoactive drug usage on female adolescents” were all noted by the researcher as the search words. These variables were classified as categorical/continuous in each study. After the quality assessment, studies were categorized based on their overall score, which ranged from 1 to 8, the CASP checklist was applied to the 11 (eleven) included articles, and the scores were assigned ([Appendix](#)). In the CASP checklist, there are three possible answers: “Yes,” “neither yes nor no,” and “o.” Notably, the checklist was useful in guiding the researcher to select only the best articles from the best sources. When the CASP was used to evaluate the quality of the articles included in this study, the quality score was 90% indicating that the information gleaned and used from the studies is of high quality, valid, and reliable, which in turn facilitates the researcher’s quest to archive the research goals and objectives simultaneously.

Data synthesis

A method for qualitative data synthesis was

used in this review. The substantial variability of the key outcome measures was precluded using an aggregated data analysis. The sample size, amount of evidence, bias risk, and degree of heterogeneity/homogeneity were considered when interpreting the study’s findings. The following preference criteria were considered if there were duplicate primary studies:

- Availability of numerical data or findings.
- Highest SIGN rating (A quality assessment tool for systematic reviews).
- More recent date of publication.
- More studies and observations.

In certain instances, the post-study analysis carried out was disclosed in additional papers. In these instances, the researcher’s data extraction was guided by both reports.

Results and Discussion

The eleven (eleven) articles that were considered in this study were discussed from every angle. A systematic review of the use, prevalence, causes, and effects of IV psychoactive drugs among adolescent females provides answers to the discussion, which is also retrieved from the included studies in a way that addresses the aim of the study. For the goal of critical analysis and to avoid biases of any claims made in these articles, it is also important to note that external publications support the debate.

The prevalence of intravenous psychoactive drug use among female adolescents

According to this study, the prevalence of intravenous psychoactive drug use indicates the frequency with which a population (female adolescents) consumes these drugs. Looking at the incidence of intravenous psychoactive drug use among female teenagers worldwide, it is evident that there is still a significant amount of usage of these substances [24]. For instance, [25] acknowledged a projected increase in the use of intravenous psychoactive drugs among female teenagers in their study on the effectiveness of adolescent substance use treatment. The preceding translates to over 1.75 million admissions to substance use treatment programmes in 2015 and about 1.3 million female adolescents still using intravenous psychoactive substances as of 2014. To add to the aforementioned, [26] also researched trends in self-poisoning and psychotropic drug use

in individuals aged 5-19. In this study, the authors revealed that females outnumbered males 3:1 in the 33501 cases of intravenous psychoactive drug use in individuals aged 5-19 [27] also claimed that roughly 23% of Brazilian female adolescents take drugs, which supports the aforementioned statistics even more.

In contrast, [28] summarised latent classifications of polysubstance use in teenagers (10-19 years) and discussed determinants of polysubstance use in their research. The authors acknowledged that when there is a significant incidence of intravenous psychoactive drug use among female teenagers, these adolescents' drug use levels and classes vary. For instance, the prevalence of intravenous psychoactive drugs in the "no use" or "low use" classes is not concerning because youth in these classes only use the drugs on purpose and under recommendations [29]. While female adolescents only engage in extensive single-substance use of intravenous psychoactive drugs in Intermediate classes [30], polysubstance use classes were universally predicted by higher intravenous psychoactive injection use, which is linked to peer substance use and subpar academic performance [31].

It is possible to conclude that there is a projected increase in intravenous psychoactive drugs among female adolescents after a succession of insights from various writers, as stated in the preceding paragraphs. The use of intravenous psychoactive medications among female teenagers differs depending on the class. The aforementioned is true because some female adolescents fall into the "no use" or "low use" categories, meaning they only purposefully and under-prescribed dosages use intravenous psychoactive drugs. The Intermediate classes, where some female adolescents only use one substance in large doses, and the Polysubstance Use classes, where some female adolescents use multiple substances, were unanimously predicted by the higher usage of these intravenous psychoactive injections.

The causes/factors contributing to the use of intravenous psychoactive drugs among female adolescents

Several authors have contributed to their quotes to help solve the mystery of what causes the use of intravenous psychoactive drugs among female adolescents. These authors discuss the causes and factors that contribute to this use. As an illustration [32] conducted research to compile and critically analyse the published literature on street children and substance use in resource-constrained settings.

The authors empathetically opined that because they lacked orientation, information, and education, street children (children who grow up in rural areas) reported high lifetime intravenous psychoactive drug use. On the other hand [33] found that of the global sample 53.3% of urban female adolescents used intravenous psychoactive drugs because they saw it as a requirement to be considered a "big girl," according to their study that was aimed at understanding the variable of urban and rural area and how it contributes to why female adolescents use it.

Additionally, several authors have linked peer pressure to why female teenagers use intravenous psychoactive medications [34-36]. Other scientists have gone a step further and stated that female adolescents are not sufficiently attracted to the use of psychoactive drugs by peer pressure. Instead, authors like [35,37,38] claimed that family influence is the primary reason why female teenagers used intravenous psychoactive drugs. To support the aforementioned submission [39] conducted a study to examine the Influence of family factors on substance use in early adolescents. In this study, the authors looked at the concurrent and longitudinal influences of paternal and maternal factors on the levels and changes in early adolescent substance use. Based on three waves of data collection from 2,669 Chinese junior high school students in Hong Kong, the authors discovered that the degree of behavioral control exercised by fathers and mothers and the strength of the parent-adolescent bond were detrimental predictors of the early levels of substance use. Higher maternal behavioral control levels and the mother-youth connection quality predicted a slower growth rate in adolescent substance use. In contrast, it is important to note that parental psychological control was not a reliable indicator of the rate at which adolescent substance use increased [40]. Mother-adolescent relationships were a strong longitudinal predictor of teenage substance use, but fathers' behavioral control and mother-adolescent relationships were stable contemporaneous predictors of why female adolescent uses intravenous psychoactive drugs.

Furthermore, according to [27], environmental circumstances, a person's development, and a connection between genetic risk and the substance used are all contributing factors to why female adolescents use intravenous psychoactive drugs. In conclusion, it would be wise to conclude that a number of causes and circumstances contribute

to female adolescents abusing psychoactive drugs based on the efforts of various writers, which have been addressed above. According to the author of this study, there are often 7 (seven) reasons why female teenagers utilize intravenous psychoactive medications. According to [41], these factors include feeling helpless after being cut off from family, poor academic achievement, physical surroundings, prior substance use, recreational options, socialization issues, and ineffective organizational assistance.

The effects of the use of Intravenous psychoactive drugs among female adolescents

It is impossible to overestimate the negative effects of intravenous psychoactive drugs on female teenagers across all 11 (eleven) papers considered in this analysis. Because of this, this study will examine the impact of intravenous use of psychoactive substances among female teenagers concerning two authors from the 11 (eleven) studies included in this study.

First off, the study by [42], titled “Autonomic nervous system dysfunction in psychiatric disorders and the impact of psychotropic medications,” was able to pinpoint the potential cause of the increased risk of cardiovascular disease in people who have female adolescents who use intravenous psychoactive drugs. The type of cardiovascular problems linked to intravenous use of psychoactive drugs by female teenagers has been further elaborated upon by numerous authors over time [43,44]. Endocarditis is a common cardiovascular condition brought on by intravenous psychotropic substances [45]. Notably, endocarditis is a disorder characterised by inflammation of the heart’s internal lining and most frequently brought on by prolonged intravenous drug usage [45]. Endocarditis can arise from long-term use of intravenous psychoactive drugs since most drug users inject their narcotics into veins that drain into the right side of the heart. Endocarditis may consequently form in the right-sided heart valves.

Additionally, the use of intravenous psychoactive medications has been linked to several psychiatric diseases due to the aforementioned. For instance, research on the relationship between schizophrenia and nicotine usage demonstrates how smoking causes the disorder and negatively affects the brain [46]. These mechanisms align with the finding that nicotine and the schizophrenia drug clozapine successfully treat patients with the condition and can

act as substitutes for the nicotine found in cigarette smoke, making it simpler to stop smoking.

Intravenous psychoactive chemicals can potentially cause psychiatric conditions such as anxiety, dependence, mood, and psychosis disorders [47]. Even if one occurred first, the high prevalence of co-occurring substance use disorders and other mental illnesses does not prove causation. But for several reasons, determining the direction of causality is challenging. Behavioral or emotional disorders, for instance, might not be severe enough to warrant a diagnosis, but subclinical mental health conditions might lead to drug use [48]. It can be challenging to pinpoint whether substance use or mental health issues occurred because people’s memories of the time when drug use or addiction occurred may be faulty.

In addition [49] study used age-stratified logistic regression models to estimate Odds Ratios (OR) and measure the correlation between various Hormonal Contraceptive (HC) methods and psychotropic drug use. The researchers also calculated the area under the receiver operating curve to calculate the HC’s HC’s discriminatory accuracy concerning psychotropic drugs. The author also claimed that hormonal contraception is linked to intravenous psychoactive drug use in adolescent girls, in addition to the fact that the burden of depression and anxiety disorders is greater in women and that female sex hormones are especially relevant for females who use these drugs.

The examples of intravenous psychoactive drugs used by female adolescent

Different opinions on the kinds and uses of various intravenous psychoactive drugs by female adolescents can be found across this study’s 11 (eleven) papers.

While tobacco and marijuana were listed by [32,50] as the two most commonly utilised intravenous psychoactive substances by female teenagers, on the other hand [26] criticised the fact that female adolescents appear to use marijuana and cigarettes only as antidepressants. The benzodiazepines, escitalopram, fluoxetine, quetiapine, Selective Serotonin Reuptake Inhibitors (SSRIs), and sertraline were among the most commonly used intravenous psychoactive drugs by female adolescents, according to [26] research on trends in self-poisoning and psychotropic drug use in people aged 5 to 19. In addition to the preceding, [36], who was researching the use of psychoactive substances by adolescents

in Nigeria, claimed that coffee and hypnosedatives are primarily instances of intravenous psychoactive drugs utilised by female adolescents.

However, in the study by [33], the authors focused on the usage and knowledge of novel psychoactive substances among young adults in both urban and rural settings. The authors listed many intravenous psychoactive substances used by female teenagers, with various usage rates. According to this study's authors, urban areas had a higher knowledge of Novel Psychoactive Substances (NPS) than the rest of the world, with 53.3% of the worldwide sample declaring to have some understanding of them. The study also identified a few intravenous psychotropic medications utilised by female adolescents. These intravenous psychoactive substances include methamphetamine (21.7%), mephedrone (26%) and desomorphine (22.6%).

The intervention of intravenous psychoactive drugs used by female adolescent

After much has been stated about the prevalence, causes, effects, and examples of female adolescents using intravenous psychoactive drugs, it is critical to offer strategies to reduce this use to have a healthier world and healthy female adolescent populations.

The intervention of intravenous psychoactive drug use by female teenagers is taken from [25] study on the effectiveness of treatment for adolescent substance use, one of the 11 (eleven) studies included in this study. The research by [25] identified the most effective interventions for releasing female adolescents from the grip of psychoactive drug use as Motivational Enhancement Therapy (MET), family therapy, Cognitive-Behavioural Therapy (CBT), behavioural therapy, and assertive continuing care. Similarly [30], study looked at the concurrent and long-term effects of maternal and paternal variables on the amounts and trends of early adolescent substance use. According to [30], adolescent substance use was predicted to increase at a slower rate by having better parental behavioural control and mother-adolescent relationships. The results highlight the crucial responsibilities that parents play in influencing teenage substance use as a result.

Finally [27], in their study on the use of psychoactive substances by adolescents, made the following conclusion: "Few interventions to the use of intravenous psychoactive drug use imply that there should be restrictions and access to drugs, preventing

progression to serious patterns of abuse or dependence along with facilitating prompt recognition of initial use." Furthermore, the authors argued that intervention should be extensive, covering academic and professional pursuits as well as leisure activities and social connections, all of which are essential for restoring normal teenage development.

Conclusion

Reviewing the prevalence, causes, and effects of IV psychoactive drug use among female adolescents was the goal of this study. This study aimed to determine the prevalence of intravenous psychoactive drug use among female teenagers. To that end, the researcher conducted a systematic review to evaluate the previous literature on the subject.

According to the research, there is still a high prevalence of intravenous psychoactive drug use among female adolescents worldwide. Seven (seven) main causes or factors contribute to this, including feeling helpless after being estranged from family, poor academic performance, the physical environment, prior drug use, recreational alternatives, and sex. Additionally, this study identifies certain hormonal contraceptives, cardiovascular illness, and psychiatric problems such as anxiety, dependence, mood, and psychosis disorders as side effects of intravenous use of psychoactive substances among female teenagers (HC). This study identified benzodiazepines, escitalopram, methamphetamine, Mephedrone, and desomorphine as some examples of intravenous psychoactive substances used by female teenagers. Regarding the usage of psychoactive medications by female adolescents who get them intravenously. According to this study, the most successful methods for assisting female adolescents in breaking free from psychoactive drug use include increased Motivational Enhancement Treatment (MET), family therapy, Cognitive-Behavioural Therapy (CBT), behavioural therapy, and aggressive ongoing care.

Only databases like Google Scholar, Emerald, PubMed, and Science-Direct were used in this study, which limits future research to those sources. Future research should consider databases that were not employed in this study to increase our understanding of intravenous psychoactive drug use among female teenagers. In addition, only English-language papers, primary research, and studies published during the last ten years were considered by the author (2013-2023). The scope of future research should be

expanded to explore topics that the inclusion criteria for this study prevented it from exploring.

References

- Müller CP. Drug instrumentalization. *Behav Brain Res.* 2020 Jul 15;390:112672. doi: 10.1016/j.bbr.2020.112672. Epub 2020 May 19. PMID: 32442549.
- Moncrieff J. Research on a 'drug-centred' approach to psychiatric drug treatment: assessing the impact of mental and behavioural alterations produced by psychiatric drugs. *Epidemiol Psychiatr Sci.* 2018 Apr;27(2):133-140. doi: 10.1017/S2045796017000555. Epub 2017 Oct 12. PMID: 29022518; PMCID: PMC6998955.
- Sanz C, Zamberlan F, Erowid E, Erowid F, Tagliazucchi E. The Experience Elicited by Hallucinogens Presents the Highest Similarity to Dreaming within a Large Database of Psychoactive Substance Reports. *Front Neurosci.* 2018 Jan 22;12:7. doi: 10.3389/fnins.2018.00007. Erratum in: *Front Neurosci.* 2018 Apr 11;12:229. PMID: 29403350; PMCID: PMC5786560.
- Frone MR. Employee psychoactive substance involvement: Historical context, key findings, and future directions. *Annual Review of Organizational Psychology and Organizational Behaviour.* 2019;6(1):273-297. doi: 10.1146/annurev-orgpsych-012218-015231.
- Peacock A, Bruno R, Gisev N, Degenhardt L, Hall W, Sedefov R, White J, Thomas KV, Farrell M, Griffiths P. New psychoactive substances: challenges for drug surveillance, control, and public health responses. *Lancet.* 2019 Nov 2;394(10209):1668-1684. doi: 10.1016/S0140-6736(19)32231-7. Epub 2019 Oct 23. PMID: 31668410.
- Quinlan J, Cox F. Acute pain management in patients with drug dependence syndrome. *Pain Rep.* 2017 Jul 27;2(4):e611. doi: 10.1097/PR9.0000000000000611. PMID: 29392226; PMCID: PMC5741366.
- Plumber N, Majeed M, Ziff S, Thomas SE, Bolla SR, Gorantla VR. Stimulant Usage by Medical Students for Cognitive Enhancement: A Systematic Review. *Cureus.* 2021 May 22;13(5):e15163. doi: 10.7759/cureus.15163. PMID: 34178492; PMCID: PMC8216643.
- Loganathan K, Lv J, Copley V, Zalesky A, Ho ETW. Valuation system connectivity is correlated with poly-drug use in young adults. *Neurosci Res.* 2021 Dec;173:114-120. doi: 10.1016/j.neures.2021.06.006. Epub 2021 Jun 29. PMID: 34214618.
- Bouso JC, Ona G, Kohek M, Dos Santos RG, Hallak JEC, Alcázar-Córcoles MÁ, Obiols-Llandrich J. Hallucinations and Hallucinogens: Psychopathology or Wisdom? *Cult Med Psychiatry.* 2023 Jan 12:1-29. doi: 10.1007/s11013-022-09814-0. Epub ahead of print. PMID: 36633720; PMCID: PMC9838303.
- Visconti AJ, Sell J, Greenblatt AD. Primary Care for Persons Who Inject Drugs. *Am Fam Physician.* 2019 Jan 15;99(2):109-116. PMID: 30633481.
- Lucas CJ, Galettis P, Schneider J. The pharmacokinetics and the pharmacodynamics of cannabinoids. *Br J Clin Pharmacol.* 2018 Nov;84(11):2477-2482. doi: 10.1111/bcp.13710. Epub 2018 Aug 7. PMID: 30001569; PMCID: PMC6177698.
- Crowe TP, Greenlee MHW, Kanthasamy AG, Hsu WH. Mechanism of intranasal drug delivery directly to the brain. *Life Sci.* 2018 Feb 15;195:44-52. doi: 10.1016/j.lfs.2017.12.025. Epub 2017 Dec 22. PMID: 29277310.
- Simmons RG, Blyth DA. Moving into Adolescence. Simmons RG, editor. Routledge; 2017.
- Muhammad T, Srivastava S, Kumar P, Patel SK. What predicts the early sexual debut among unmarried adolescents (10-19 years)? Evidence from UDAYA survey, 2015-16. *PLoS One.* 2021 Jun 10;16(6):e0252940. doi: 10.1371/journal.pone.0252940. PMID: 34111205; PMCID: PMC8192016.
- Clark H, Coll-Seck AM, Banerjee A, Peterson S, Dalglish SL, Ameratunga S, Balabanova D, Bhan MK, Bhutta ZA, Borrazzo J, Claeson M, Doherty T, El-Jardali F, George AS, Gichaga A, Gram L, Hipgrave DB, Kwamie A, Meng Q, Mercer R, Narain S, Nsungwa-Sabiiti J, Olumide AO, Osrin D, Powell-Jackson T, Rasanathan K, Rasul I, Reid P, Requejo J, Rohde SS, Rollins N, Romedenne M, Singh Sachdev H, Saleh R, Shawar YR, Shiffman J, Simon J, Sly PD, Stenberg K, Tomlinson M, Ved RR, Costello A. A future for the world's children? A WHO-UNICEF-Lancet Commission. *Lancet.* 2020 Feb 22;395(10224):605-658. doi: 10.1016/S0140-6736(19)32540-1. Epub 2020 Feb 19. Erratum in: *Lancet.* 2020 May 23;395(10237):1612. PMID: 32085821.
- Pérez-Mañá C, Papaseit E, Fonseca F, Farré A, Torrens M, Farré M. Drug Interactions With New Synthetic Opioids. *Front Pharmacol.* 2018 Oct 11;9:1145. doi: 10.3389/fphar.2018.01145. PMID: 30364252; PMCID: PMC6193107.
- Ibrahim Y, Hussain SM, Alnasser S, Almohandes H, Sarhandi I. Patterns and sociodemographic characteristics of substance abuse in Al Qassim, Saudi Arabia: a retrospective study at a psychiatric rehabilitation center. *Ann Saudi Med.* 2018 Sep-Oct;38(5):319-325. doi: 10.5144/0256-4947.2018.319. PMID: 30284986; PMCID: PMC6180213.
- Ritchie H, Roser M. Alcohol consumption. *Our World in Data.* 2018.
- Cunningham JA, Godinho A, Kushnir V. Can Amazon's Mechanical Turk be used to recruit participants for internet intervention trials? A pilot study involving a randomized controlled trial of a brief online intervention for hazardous alcohol use. *Internet Interv.* 2017 Sep 9;10:12-16. doi: 10.1016/j.invent.2017.08.005. PMID: 30135748; PMCID: PMC6084901
- Grebely J, Larney S, Peacock A, Colledge S, Leung J, Hickman M, Vickerman P, Blach S, Cunningham EB, Dumchev K, Lynskey M, Stone J, Trickey A, Razavi H, Mattick RP, Farrell M, Dore GJ, Degenhardt L. Global, regional, and country-level estimates of hepatitis C infection among people who have recently injected drugs. *Addiction.* 2019 Jan;114(1):150-166. doi: 10.1111/add.14393. Epub 2018 Aug 28. PMID: 30035835; PMCID: PMC6657799.

21. Massey SH, Newmark RL, Wakschlag LS. Explicating the role of empathic processes in substance use disorders: A conceptual framework and research agenda. *Drug Alcohol Rev.* 2018 Mar;37(3):316-332. doi: 10.1111/dar.12548. Epub 2017 May 10. PMID: 28493364; PMCID: PMC5681447.
22. Janicijevic KM, Kocic SS, Radevic SR, Jovanovic MR, Radovanovic SM. Socioeconomic Factors Associated with Psychoactive Substance Abuse by Adolescents in Serbia. *Front Pharmacol.* 2017 Jun 13;8:366. doi: 10.3389/fphar.2017.00366. PMID: 28659800; PMCID: PMC5468426.
23. Wickham SR, Amarasekara NA, Bartonicek A, Conner TS. The Big Three Health Behaviors and Mental Health and Well-Being Among Young Adults: A Cross-Sectional Investigation of Sleep, Exercise, and Diet. *Front Psychol.* 2020 Dec 10;11:579205. doi: 10.3389/fpsyg.2020.579205. PMID: 33362643; PMCID: PMC7758199.
24. Fattore L, Marti M, Mostallino R, Castelli MP. Sex and Gender Differences in the Effects of Novel Psychoactive Substances. *Brain Sci.* 2020 Sep 3;10(9):606. doi: 10.3390/brainsci10090606. PMID: 32899299; PMCID: PMC7564810.
25. Tanner-Smith E, Steinka-Fry K, Kettrey H, Lipsey M. Adolescent substance use treatment effectiveness: A systematic review and meta-analysis. 2016.
26. Cairns R, Karanges EA, Wong A, Brown JA, Robinson J, Pearson SA, Dawson AH, Buckley NA. Trends in self-poisoning and psychotropic drug use in people aged 5-19 years: a population-based retrospective cohort study in Australia. *BMJ Open.* 2019 Feb 20;9(2):e026001. doi: 10.1136/bmjopen-2018-026001. PMID: 30787095; PMCID: PMC6398641.
27. Lopes GM, Nóbrega BA, Del Prette G, Scivoletto S. Use of psychoactive substances by adolescents: current panorama. *Braz J Psychiatry.* 2013;35 Suppl 1:S51-61. doi: 10.1590/1516-4446-2013-S105. PMID: 24142128.
28. Tomczyk S, Isensee B, Hanewinkel R. Latent classes of polysubstance use among adolescents-a systematic review. *Drug Alcohol Depend.* 2016 Mar 1;160:12-29. doi: 10.1016/j.drugalcdep.2015.11.035. Epub 2015 Dec 11. PMID: 26794683.
29. Ho BC, Barry AB, Koeppl JA, Macleod J, Boyd A, David A, O'Leary DS. Recreational marijuana use, adolescent cognitive development and schizophrenia susceptibility. *Biological Psychiatry Global Open Science.* 2022. doi: 10.1016/j.bpsgos.2022.01.008.
30. Luthar SS, Small PJ, Ciciolla L. Adolescents from upper middle class communities: Substance misuse and addiction across early adulthood. *Dev Psychopathol.* 2018 Feb;30(1):315-335. doi: 10.1017/S0954579417000645. Epub 2017 May 31. Erratum in: *Dev Psychopathol.* 2018 May;30(2):715-716. PMID: 28558858.
31. Moore K, Wells H, Feilding A. Roadmaps to regulation: MDMA. Beckley foundation. 2019.
32. Embleton L, Mwangi A, Vreeman R, Ayuku D, Braitstein P. The epidemiology of substance use among street children in resource-constrained settings: a systematic review and meta-analysis. *Addiction.* 2013 Oct;108(10):1722-33. doi: 10.1111/add.12252. Epub 2013 Jul 12. PMID: 23844822; PMCID: PMC3776018.
33. Martinotti G, Lupi M, Carlucci L, Cinosi E, Santacroce R, Acciavatti T, Chillemi E, Bonifaci L, Janiri L, Di Giannantonio M. Novel psychoactive substances: use and knowledge among adolescents and young adults in urban and rural areas. *Hum Psychopharmacol.* 2015 Jul;30(4):295-301. doi: 10.1002/hup.2486. PMID: 26216566.
34. Tomaszek K, Muchacka-Cymerman A. Sex Differences in the Relationship between Student School Burnout and Problematic Internet Use among Adolescents. *Int J Environ Res Public Health.* 2019 Oct 24;16(21):4107. doi: 10.3390/ijerph16214107. PMID: 31653105; PMCID: PMC6862502.
35. Anetor GA. The socio-economic effects of substance abuse in Nigerian youths: A case study of neuro-psychiatric hospital, yaba, lagos. *Archives of Basic and Applied Medicine.* 2019;7(1):4641-4646.
36. Okogbenin E. Psychoactive substance use among adolescents in Nigeria: A systematic review. *International Journal of Science Academic Research.* 2021.
37. Sitaram SK. Pattern of substance abuse among children in slum areas of India. Substance use disorder: New research perspectives in the diagnosis. Treatment, and Prognosis. 2022. doi: 10.5772/intechopen.105596.
38. Bhandari TR, Khatiwada B, Rajbhandari B, Bestman A, Mistry SK, Rayamajhee B, Rawal LB, Yadav UN. A qualitative study to understand drivers of psychoactive substance use among Nepalese youth. *PLoS One.* 2021 Nov 5;16(11):e0259021. doi: 10.1371/journal.pone.0259021. PMID: 34739508; PMCID: PMC8570474.
39. Shek DTL, Zhu X, Dou D, Chai W. Influence of Family Factors on Substance Use in Early Adolescents: A Longitudinal Study in Hong Kong. *J Psychoactive Drugs.* 2020 Jan-Mar;52(1):66-76. doi: 10.1080/02791072.2019.1707333. Epub 2019 Dec 22. PMID: 31865866.
40. Shek DTL, Zhu X, Ma CMS. The Influence of Parental Control and Parent-Child Relational Qualities on Adolescent Internet Addiction: A 3-Year Longitudinal Study in Hong Kong. *Front Psychol.* 2018 May 1;9:642. doi: 10.3389/fpsyg.2018.00642. PMID: 29765349; PMCID: PMC5938405.
41. Kahsay ZH, Tesema AG, Bazzano AN. A qualitative study of drivers of psychoactive substance use among Mekelle University students, Northern Ethiopia. *Subst Abuse Treat Prev Policy.* 2019 Mar 4;14(1):11. doi: 10.1186/s13011-018-0190-1. PMID: 30832696; PMCID: PMC6398241.
42. Alvares GA, Quintana DS, Hickie IB, Guastella AJ. Autonomic nervous system dysfunction in psychiatric disorders and the impact of psychotropic medications: a systematic review and meta-analysis. *J Psychiatry Neurosci.* 2016 Mar;41(2):89-

104. doi: 10.1503/jpn.140217. PMID: 26447819; PMCID: PMC4764485.
43. Brouillette J, Nattel S. A Practical Approach to Avoiding Cardiovascular Adverse Effects of Psychoactive Medications. *Can J Cardiol.* 2017 Dec;33(12):1577-1586. doi: 10.1016/j.cjca.2017.09.001. Epub 2017 Sep 11. PMID: 29173600.
44. Beach SR, Celano CM, Sugrue AM, Adams C, Ackerman MJ, Noseworthy PA, Huffman JC. QT Prolongation, Torsades de Pointes, and Psychotropic Medications: A 5-Year Update. *Psychosomatics.* 2018 Mar-Apr;59(2):105-122. doi: 10.1016/j.psym.2017.10.009. Epub 2017 Nov 3. PMID: 29275963.
45. Ray V, Waite MR, Spexarth FC, Korman S, Berget S, Kodali S, Kress D, Guenther N, Murthy VS. Addiction Management in Hospitalized Patients With Intravenous Drug Use-Associated Infective Endocarditis. *Psychosomatics.* 2020 Nov-Dec;61(6):678-687. doi: 10.1016/j.psym.2020.06.019. Epub 2020 Jul 2. PMID: 32778422.
46. Lucatch AM, Lowe DJE, Clark RC, Kozak K, George TP. Neurobiological Determinants of Tobacco Smoking in Schizophrenia. *Front Psychiatry.* 2018 Dec 6;9:672. doi: 10.3389/fpsyt.2018.00672. PMID: 30574101; PMCID: PMC6291492.
47. Kapitány-Fövény M, Farkas J, Pataki PA, Kiss A, Horváth J, Urbán R, Demetrovics Z. Novel psychoactive substance use among treatment-seeking opiate users: The role of life events and psychiatric symptoms. *Hum Psychopharmacol.* 2017 May;32(3). doi: 10.1002/hup.2602. Epub 2017 Jun 15. PMID: 28618002.
48. Parker C, Tejerina-Arreal M, Henley W, Goodman R, Logan S, Ford T. Are children with unrecognised psychiatric disorders being excluded from school? A secondary analysis of the British Child and Adolescent Mental Health Surveys 2004 and 2007. *Psychol Med.* 2019 Nov;49(15):2561-2572. doi: 10.1017/S0033291718003513. Epub 2018 Dec 20. PMID: 30572975.
49. Zettermark S, Perez Vicente R, Merlo J. Hormonal contraception increases the risk of psychotropic drug use in adolescent girls but not in adults: A pharmacoepidemiological study on 800 000 Swedish women. *PLoS One.* 2018 Mar 22;13(3):e0194773. doi: 10.1371/journal.pone.0194773. PMID: 29566064; PMCID: PMC5864056.
50. Rehm J, Probst C, Falcón LL, Shield KD. Burden of disease: The epidemiological aspects of addiction. *Textbook of Addiction Treatment.* 2020;51-64. doi: 10.1007/978-88-470-5322-9.

How to cite this article: Nkporbu AK, Metu I, Stanley PC. A Systematic Review of Intravenous Psychoactive Drug Use among Adolescent Females. 2023 Mar 07; 4(3): 321-330. doi: 10.37871/jbres1679, Article ID: JBRES1679, Available at: <https://www.jelsciences.com/articles/jbres1679.pdf>