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A Systematic Literature Review on the Predictors of Drug Abuse, Substance Use, and Opioid Misuse among Adolescents

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Abstract

This article reviews opioid misuse, prescribed opioids dependence, and drug addiction among adolescents. It aims to identify predictors of substance use, opioid abuse, and prescribed opioids misuse in this demographic. The review covers articles from 2016 to 2022, totaling 31 articles. Descriptively, substance use was the main outcome in 15 studies, followed by opioid misuse in 11 studies, and prescribed opioid misuse in 5 studies. Common influencing factors include family-related aspects, pain severity, comorbidities, demographics, substance use disorders, addictive behaviors, and peer influence. Clinicians should consider these factors when identifying at-risk adolescents, emphasizing the need for alternative pain management strategies.

Keywords: Drug addiction; substance use; opioid misuse; prescribed opioid misuse

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1.0 Introduction

Drug addiction and substance use are among the main health concerns affecting adolescents and young adults worldwide. Substance use refers to the persistent use of substances, illegal drugs, or misuse of over-the-counter or prescribed drugs with adverse outcomes. According to the World Health Organisation, drug use accounted for 12.4% of mortality globally in 2020 with the Global Burden of Disease Project estimating that substance use is among the six fastest-growing causes of global deaths from 2002 to 2030 (World Health Organisation, 2020).

Adolescence and young adulthood are characterised by stages of identity exploration such as gender identity, sexual orientation, and sensation seeking, which may increase the risk of substance use (Brumback, T., Thompson, W., Cummins, K., Brown, S., & Tapert, S., 2021). Substance use initiation during these periods commences by experimenting and exploring substance effects, followed by problematic use characterised by recurrent exposure (Martins, S. S., Fenton, M. C., Keyes, K. M., Blanco, C., Zhu, H., & Storr, C. L.,

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2012). The multifaceted developmental changes, ranging from biological to sociocultural aspects, occurring during adolescence and emerging adulthood could be deranged following the use of substances (Barnett, T. E., Thompson, E. L., Litt, D. M., & Lewis, M. A., 2019). Early substance users are more likely to experience psychosocial problems, psychiatric disorders and poor peer relationships. Additionally, these issues are linked to the failure to effectively engage in self-management practices for substance use (Gilam, G., Sturgeon, J. A., You, D. S., Wasan, A. D., Darnall, B. D., & Mackey, S. C., 2020a). Despite the extensive literature on opioid misuse, and prescription opioid misuse, a systematic review of the factors or predictors of substance use and considering both opioid and prescription opioid misuse, particularly in adolescents is lacking (Brumback et al., 2022). This article presents a systematic literature review to gather the current evidence on the predictors of substance use, opioid abuse, and misuse of prescribed opioids in adolescents. In particular, the main objective of the SLR is to determine the predictors of substance abuse in adolescents in Malaysia.

2.0 Literature Review

Opioid misuse is also a significant problem and a national public health emergency. The use of opioids such as cocaine and amphetamine is associated with an increased risk of severe health consequences (MacMillan, T., Corrigan, M. J., Coffey, K., Tronnier, C. D., Wang, D., & Krase, K., 2022). Apart from opioid misuse, prescription opioid use which is usually employed for acute pain therapy from illness or injury could also be misused. For instance, prescription opioids correlated positively with misuse of such medication (Cragg, A., Hau, J. P., Woo, S. A., Kitchen, S. A., Liu, C., Doyle-Waters, M. M., & Hohl, C. M., 2019), leading to an increased risk of overdose and death. To mitigate opioid misuse among adolescents and emerging adults, it is crucial to elucidate the predictors, especially during the development period – a transition phase in an individual's life where behavioural patterns and lifestyle activities are shaped. Recent studies highlighted that initiation and persistent drug use are associated with several social, demographic, psychological, family-related, and personality (Brumback et al., 2021; Barnett et al., 2019). Given the extensive literature on opioid misuse, and prescription opioid misuse, reviews on these forms of substance use have been undertaken separately in previous studies (Bonar et al., 2020; Nargiso et al., 2015). However, a systematic review of the factors or predictors of substance use and considering both opioid and prescription opioid misuse, particularly in adolescents is lacking. Therefore, this article offers a comprehensive review of the factors that predict substance use, opioid abuse, and the misuse of prescribed opioids among adolescents, to address the existing gaps in our understanding of drug abuse.

3.0 Methodology

This systematic review was performed using the PRISMA guidelines as described by Page et al. (2021).

3.1 Search strategy

A detailed literature search was performed in three electronic databases: ScienceDirect, PUBMED, and Emerald from September 4, 2022, to November 30, 2022. Only original research articles that were written in English and published from January 1, 2017, to November 1, 2022, were considered in the search process. Specifically, the keywords used for the literature search process were "predictors", "factors", "drug addiction", "drug abuse", "drug misuse", "substance use", "adolescence" and opioid use". These keywords were combined with combination with Boolean operators 'AND' and 'OR'.

3.2 Inclusion/exclusion criteria of the study

The inclusion and exclusion criteria considered in this systematic literature review are presented in Table 1.

Table 1: The inclusion and exclusion criteria

Factors	Inclusion criteria	Exclusion criteria
Studies	Empirical studies (i.e., cross-sectional, longitudinal, randomised control trial), qualitative and mixed-methods research, case studies, and pilot studies	Reviews, study protocols or concept articles, editorial letters, expert opinions, book chapters, policy briefs, conference and proceedings, thesis/dissertation, and other secondary studies
Research topics	Studies that considered associated factors, predictors, or determinants of substance use, drug abuse, opioid or prescribed opioid misuse among adolescents	Studies on only substance or drug use without considering the associated or causal factors and adolescent age. Neither substance use, drug abuse, opioid or prescribed opioid misuse/dependence was the topic of interest
Study participants	Adolescents, emerging adults, school-age children	Older adults, aged-individuals
Outcomes	Substance use, drug use, opioid use/misuse, and prescription opioid use/misuse	

3.3 Screening articles for eligibility, data extraction and data synthesis

The primary search retrieved many articles that were forwarded to an email repository and stored. Next, the articles were subjected to the first screening to identify and remove duplicates. The title of each manuscript was then checked and screened for eligibility. During this stage, articles with irrelevant titles were removed from the list, whereas those aligning with the inclusion criteria were selected for abstract screening and full-text reading. Data extraction was performed by reading the full text of the included studies, and the main

findings were summarised. Data synthesis was conducted by thematic analysis, focusing on the factors associated with substance use, opioid misuse, and drug use among adolescents.

4.0 Findings

4.1 Search outcomes

A total of 824 articles were retrieved from the three databases: PUBMED (n = 196), Emerald (n = 102) and ScienceDirect (n = 526). Approximately 35% (286) of the retrieved results were duplicates and they were deleted from the list (Figure 1). Meanwhile, 292 articles failed to align with the inclusion criteria. Only 102 articles were selected for further review after title screening. In the last stage, 31 articles were selected and included in the final analysis.

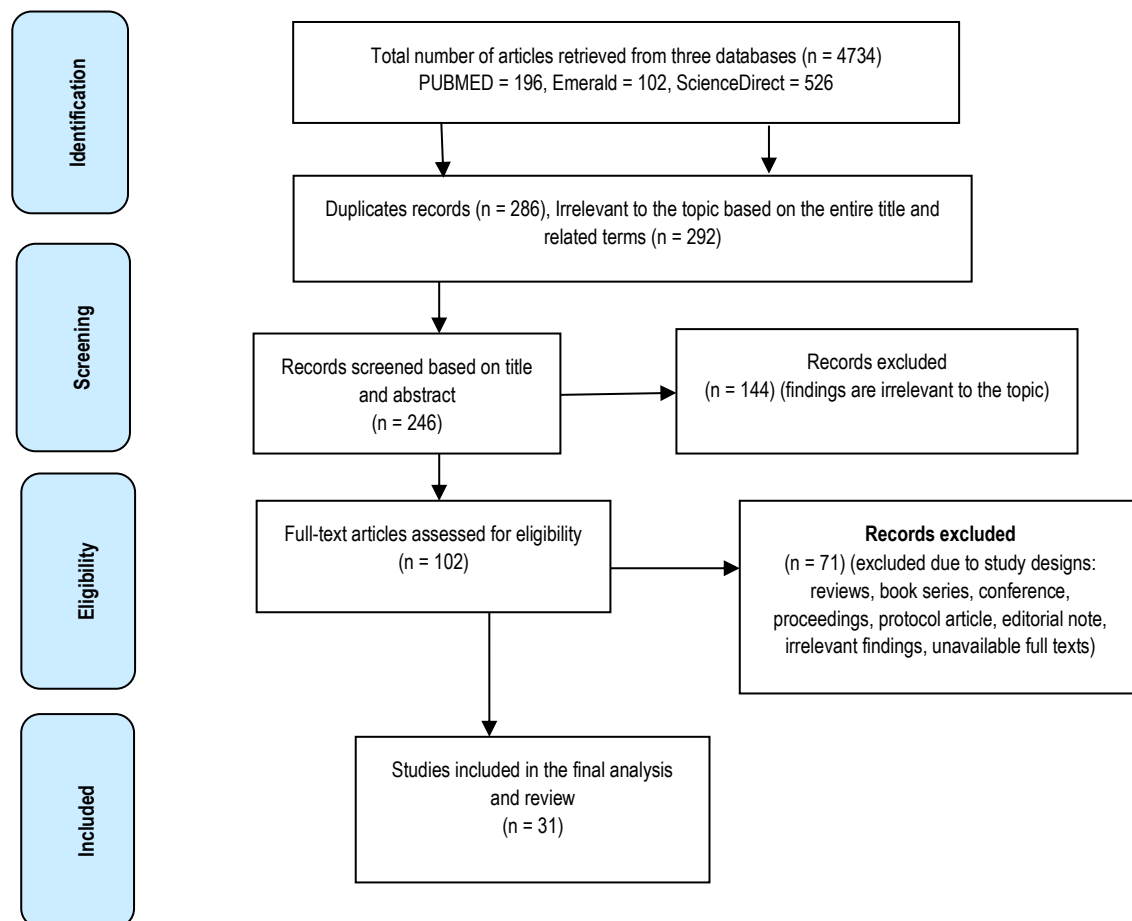


Figure 1: Literature search process and flow diagram using the PRISMA guideline

4.2 Thematic analysis results

Six broad themes were obtained from the thematic analysis as follows: family-related factors, pain severity and interference, Demographic Factors, Comorbidity and psychopathology, substance use disorders, and peer influence.

Family-related factors

Family-related factors were among the most investigated variables in the reviewed studies. In China, Shek, D. T. L., Zhu, X., Dou, D., & Chai, W. (2020) assessed the impact of maternal and paternal factors on substance use levels among early adolescents in junior high schools and discovered the diverse influence of both factors. The rate of increase in substance use was slower relative to a higher quality of mother-adolescent relationships and levels of maternal behavioural control. Parental substance use and incarceration were significant predictors of substance use and delinquency among self-identified gang members ranging from 14 to 19 years old in the US (Quinn, K., Walsh, J. L., & Dickson-Gomez, J., 2019)

In terms of opioid use, lower family disapproval of use was positively linked to a higher risk of lifetime and past month opioid misuse among adolescents (Nalven, T., Spillane, N. S., & Schick, M. R., 2020). Tucker, J. S., Davis, J. P., Seelam, R., Stein, B. D., & D'Amico, E. J. (2020) depicted that the likelihood of opioid misuse during the transition to emerging adulthood was predicted by having an older

sibling with alcohol and marijuana use (Tucker et al., 2020). Overall, family-related factors have either a protective or predisposing role in substance use/opioid misuse in this vulnerable population (Matta et al., 2022).

Pain Severity and Interference

Upon adjusting for demographic profile and injury severity score, Whiteside et al. (2016) found that the likelihood of reporting preinjury marijuana uses, and higher baseline pain scores were significantly associated with sustained prescription opioid use. In a recent study, Gilam et al. (2020) revealed that greater impairment across the pain severity measures was demonstrated by patients taking opioid medications. Specifically, pain intensity–worst was one of the few significant predictors of prescribed opioid misuse. Marel et al. (2019) demonstrated a significant association between medication side effects and higher interference of pain-related activity among patients with chronic musculoskeletal pain.

Demographic Factors

In this review, the most reported demographic variables include age, gender, race, type of occupation, educational level, and residential location. Younger individuals were more likely to experience prescription drug use disorder relative to older individuals (Hah et al., 2017; Barnett et al., 2019). Likewise, a prospective cross-sectional study in Iran depicted younger age at first drug use as a predictor of persistent drug use in early and late adulthood (Amirabadizadeh, A., Nezami, H., Vaughn, M. G., Nakhaee, S., & Mehrpour, O., 2018)

In terms of gender, the association between this variable and substance use or opioid misuse appears to vary in diverse contexts. Vasilenko, S. A., Evans-Polce, R. J., & Lanza, S. T. (2017) reported a higher risk of opioid substance use disorder in younger male individuals relative to female individuals. Meanwhile, both genders aged above 60 years exhibited similar levels of opioid substance use disorder. The preference for specific substance use may differ between young males and females as evident in the study by Delgado-Lobete, L., Montes-Montes, R., Vila-Paz, A., Cruz-Valiño, J.-M., Gándara-Gafo, B., Talavera-Valverde, M.-Á., & Santos-del-Riego, S. (2020), where higher odds of substance use were associated with being a male student. However, such a relationship was lacking for alcohol and tobacco smoking.

A few studies reported that substance and opioid use differs between individuals of diverse races. Goudra, B., Guthal, A, Singh, PS (2021) focused on the predictors of chronic opioid use after orthopaedic surgery in young patients. Black patients recorded a higher odds ratio and relative risk for opioid misuse relative to white patients. Similarly, Barnett et al. (2019) found that the risk of non-medical prescription opioid use was significantly higher among American Indian/Alaskan Natives than among other races. Other related demographic factors associated with substance use, opioid misuse, and prescription opioid misuse include low educational qualification Pike, J. R., Fadardi, J. S., Stacy, A. W., & Xie, B., (2021) single/unmarried status, and being unemployed (Amirabadizadeh et al., 2017).

Comorbidity and psychopathology

Pre-existing mental disorders were significantly associated with an increased risk of developing a SUD for alcohol, cannabis and stimulant use disorder in Australian young adults Marel, C., Sunderland, M., Mills, K. L., Slade, T., Teesson, M., & Chapman, C., (2019). Thi Nguyen et al. (2018) also found that substance use was significantly higher among those with various health conditions, including mental derangement.

Depression resulting from living with chronic pain conditions was a significant predictor of prescribed opioid misuse in young patients (Gilam et al., 2020). In the same location, psychopathologies including depression and stress arising from contracting COVID-19 were strongly linked to substance use (MacMillan et al., 2021). Long-term psychopathy resulting from experiencing physical abuse was also identified as the main distinguishing factor between the two groups of substance use (Yampolskaya et al., 2019).

Substance Use Disorders

Comorbid SUD is highly common in patients with chronic pain. Nalven et al. (2020) found that the risk of past month opioid misuse was significantly higher among participants with greater peer substance use. A study conducted in Uganda revealed that patients with a history of treatment for substance abuse were more likely to engage in non-medical and lifetime use of controlled prescription drugs (Kamba et al., 2021). Similarly, Barnett et al. (2019) found that marijuana and alcohol users had higher odds of non-medical prescription opioid use compared to those who were involved in the use of any substance.

In the US, adolescents reporting preinjury marijuana use demonstrated greater odds of sustained prescription opioid use (Whiteside et al., 2016). Similar findings were reported by Morley et al. (2017) and Hah et al. (2017). These findings are consistent with the report by Pike et al. (2021) on healthy adolescents as higher odds of experimenting with non-prescription opioids were recorded among adolescents using illicit drugs, excluding marijuana.

Peer influence

Nalven et al. (2020) found that higher peer substance use was associated with a greater risk of lifetime and past-month opioid misuse. More importantly, the only variable that was significantly linked to a higher risk of lifetime and past month heroin use was greater peer substance use. In the same vein, Tucker et al. (2020) in a large survey data from a diverse California cohort (n = 6509) focused on several aspects of peer influence such as time spent with peers, perceived norms, and peer approval, and their relationship with opioid misuse. Upon adjusting for confounding variables, peer approval was the most significant predictor of opioid misuse in the young participants. Meanwhile, peer influence is directly associated with substance use among nursing and public health students in Nepal (Panthee et al., 2017).

5.0 Discussion

Drug addiction and substance use are highly prevalent in adolescents and are considered an epidemic in several countries worldwide. Non-medical opioid use and prescription opioid misuse are common among adolescents and these issues have received extensive interest in recent literature. This review uncovers five broad dimensions or factors that have been consistently reported as predictors of substance use and opioid misuse among young adults, comprising family-related factors, pain severity and interference, demographics, SUDs and other drug addiction behaviours, comorbidity and psychopathy, and peer influence.

The association between a higher risk of substance use or opioid misuse and family-related factors and pain severity is consistent with previous reviews. Numerous pain complaints and a higher degree of pain-related challenges are common in patients categorised as high-risk for opioid misuse. Previous studies have highlighted low pain threshold or tolerance in patients with previous and active addictions, but it remains unclear if the risk for addiction is increased by low pain tolerance levels and vice versa (Cragg et al., 2019).

Another important predictor of opioid and prescriptive opioid misuse was substance use disorders and other addictive behaviours such as alcohol consumption and tobacco smoking. Numerous studies have highlighted the positive association between comorbid substance use disorders and prescriptive opioid misuse as found in the present review (Nalven et al., 2020; Kamba et al., 2021). For instance, young individuals having a history of alcohol abuse, marijuana use, and cannabis increased the odds of opioid abuse (Pike et al., 2021).

Comorbidity and psychopathy played a significant role in promoting substance use and misuse of prescription drugs or dependence. Adolescents facing psychological problems, mood disorders, and psychosocial stress are more likely to engage in substance use (Martins et al., 2012), which is consistent with the findings gleaned from the present review (Marel et al., 2019; Yitayih et al., 2018). Nevertheless, despite the strong evidence of increasing opioid misuse among patients with mental disorders, there is limited information to elucidate the underlying mechanisms linking opioid misuse and mental illness.

Specific demographic profiles influenced the risk of substance use and opioid misuse among adolescents. A significant negative relationship was observed between the diagnosis of opioid misuse and age and younger age (Hah et al., 2017), thus supporting previous studies reporting the negative association between abuse and misuse behaviours and older age (Papaleontiou et al., 2010). While the misuse of prescribed opioids by elderly patients was attributed to negligence and ignorance, younger individuals were more likely to misuse such drugs for sensation seeking and to get high (Brumback et al., 2021). Although evidence was lacking to ascertain whether the risk of opioid misuse differed between female and male adolescents, a clearer relationship was observed between race and substance/opioid use (Goudra et al., 2020). A previous systematic review and meta-analysis posited that cultural bias may contribute to the higher prescription rate of opioid analgesics for white patients in primary care practices and emergency departments (Jumbe et al., 2021).

The limitations of this study are well-acknowledged. By using certain inclusion criteria in the literature search and three databases, some relevant articles might have been excluded from the results. All the articles used observational study designs, such as cross-sectional, prospective cohort, and retrospective methods, which only assisted the researcher in documenting the predictors and factors associated with substance/opioid use and prescription opioid misuse or dependence. Therefore, a causal inference could be deduced from this systematic review as randomised control trials were not retrieved from the literature search. Nonetheless, the retrieved articles aligned with the objectives of this review – to identify the consistent and significant predictors of substance/opioid use and prescription opioid misuse among adolescents or younger populations. Since the review focused on adolescents, the identified predictors may not be generalisable to other populations, especially the elderly as peer influence and family-related factors play a minimal role in influencing substance use in such individuals.

Conclusion and Recommendations

Factors relating to demographics, family, peer influence, substance use disorders, comorbidity and psychopathy, and pain intensity and interference have been consistently reported in studies on substance use, as well as medical and non-medical opioid use/misuse among adolescents. In terms of prescription opioid misuse, concurrent substance use, and mental health disorders were the most reported predictors. Clinicians may consider these factors for a better understanding of opioid substance misuse, especially adolescent patients requiring analgesia. The information herein highlights the areas to focus on when it becomes necessary to prescribe opioids to this vulnerable and young population. Meanwhile, researchers attempting to update the current body of literature may consider the limitations mentioned in the discussion section.

Paper Contribution to Related Field of Study

This review is the most recent systematic review on the predictors of drug abuse, substance use, and opioid misuse among adolescents.

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