



## Problematic internet use and substance use disorder among men: A scoping review

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**Abstract:** This scoping review aimed to synthesise literature on problematic internet use and substance use disorder, including how they affect men, given that prior research has predominantly focused on women. The search included Web of Science, Psych Info, Science Direct, and Scopus spanning over the period 2014–2023. Studies were included for the review if they focused on Problematic Internet Use (PIU) and Substance Use Disorder (SUD) among men, were peer-reviewed, and were written in English. Opinions, discussions, and theoretical papers were excluded. Sixteen studies were included in this review. Data were synthesised through thematic analysis. Emergent themes included gendered addiction patterns by which men were at higher risk for pathological gambling, gaming addiction, sex/pornography addiction, alcohol dependence, smoking, cocaine and cannabis. Moreover, substance use and PIU behavioral addictions in men were moderated by impulsivity, personality traits and stress for worse addictions. These findings provide leads for further research on gendered problematic internet use and substance use disorder, including the neurobiological substrates involved.

**Keywords:** problematic internet use; substance use disorder; behavioural addictions; men

### Introduction

Problematic Internet Use (PIU) and Substance Use Disorder (SUD) interact in complex ways that influence the current mental health landscape. PIU refers to use of the internet that creates psychological, social, school, and/or work difficulties in a person's life (Beard & Wolf, 2001; Kozybka et al., 2023), and with a seeming lack of control in daily life (Spada, 2014). Substance use disorder is associated with a range of symptoms, including cravings, tolerance, withdrawal, and an inability to control or cut down on substance use which can lead to clinically significant impairment or distress occurring within a 12-month period. Problematic Internet Use and SUD may be gendered, and there is need to trend the findings from recent studies to inform future studies.

### Problematic internet use (PIU) and substance use disorder (SUD)

Problematic internet use is often associated with various risk behaviours, such as substance use, and a host of other related negative consequences. It is estimated that alcohol misuse contributes to over 3 million deaths each year, making it a leading risk factor for premature mortality, especially among individuals between the ages of 20 and 39 (World Health Organization, 2022). In 2019, alcohol use accounted for 2.07 million deaths of males and 374,000 deaths of females globally. An estimate of 129–190 million people globally use cannabis, followed by amphetamine type stimulants, cocaine, and opioids (World Health Organization, 2022). In their lifetime, 13.3% of South Africans take at least one substance (Kaswa & De Villiers, 2020). While there is a dearth of demographic data on substance use in South Africa, it is estimated that 10.3% of adults (15 years and older) drink alcohol excessively (16.5% of males and 4.6% of women), and 8.6% (13.3% of men and 4.1% of women) use illegal drugs

nationally (Pengpid et al., 2021). These statistics suggest that there is a gender disparity in alcohol misuse and substance use disorders in South Africa, with higher rates observed among males compared to females. However, it is important to note that these figures are estimates, and more research is needed to fully understand the extent of the problem and the underlying factors contributing to these gender differences.

### Gendered PIU and SUD

Men and women alike are struggling with both PIU and SUD. The criteria that constitutes PIU and SUD are similar, with one main difference being that PIU is not reliant on an intoxicant in the way a SUD is. Both phenomena share a common maladaptive pattern response, which ultimately leads to impairment in various different areas of an individual's life. A cross-sectional study by Sayeed et al. (2021) found that from a sample of 404 internet users over the age of 18 years, problematic internet use was significantly higher in males than female respondents. Notably, Su et al. (2020) found that men are more likely to present with IGD and women with overuse of social networking sites, such as Facebook and Instagram. Differences exist within the literature, whereby some studies agree that PIU is more prevalent among women, although some studies contradict this notion, showing that men are more vulnerable and show higher levels of problematic internet use (Baloğlu et al., 2020). Furthermore, Su et al. (2020) stated that males have often reported experiencing higher levels of internet addiction in comparison to women, but this may differ in terms of the specific types of internet use. Additionally, a study by Laconi et al. (2017) found from a sample of 5593 internet users (2129 men and 3464 women), with individuals aged between 18 and 87 years old, that problematic internet use was more prevalent among women, with notable differences in the



type of internet use. These findings suggest that while men exhibit higher levels of overall internet addiction, women engage in different types of internet use that contribute to their vulnerability to problematic internet use. This highlights the importance of considering gender differences when studying and addressing internet addiction. Moreover, this outcome emphasises that contrary results do exist (Baloğlu et al., 2020; Su et al., 2020). Thus, this study aimed to explore problematic internet use and substance use disorder among men, a high risk and less well studied population.

### Goal of Review

This scoping review aimed to synthesise literature on PIU and SUD in adult men. The following question guided the scoping review: What does existing literature reveal about problematic internet use and substance use disorder among adult men?

### Methods

#### Research design

The present study was guided by the Joanna Briggs Institute (JBI) of evidence synthesis as the proposed methodological approach of this scoping review, which is based on earlier work by Arksey and O'Malley (2005) and Levac et al. (2010). Scoping reviews have great utility when it comes to synthesising research evidence due to their ability to map out the emerging literature on a particular subject in terms of its volume, features, and nature (Arksey & O'Malley, 2005). A scoping review is typically utilised to synthesize the emerging evidence on a topic for trends (1) to identify gaps within a body of research; and also as a precursor to a systematic review, where a preliminary mapping might be performed to ascertain whether a full systematic review is feasible or relevant. A scoping review is more appropriate for the present study as compared to a systematic review.

#### Search strategy

We searched the Web of Science, Psych Info, Science Direct and Scopus. To be included in this review, papers had to focus on the topic of PIU and SUD among men and fulfil the criteria listed in Table 1.

#### Study selection

The study selection followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) which is largely based on a PRISMA statement and checklist, the JBI methodological guidance, and other approaches for undertaking scoping reviews. The process of reviewing the

literature guided by the inclusion criteria as outlined above was achieved through three screening phases: (1) title screening, (2) abstract screening, and (3) full text screening. The selection of 16 articles were included after the elimination process (See Figure 1 below).

#### Data extraction

A draft charting table was created as part of the review process to capture key information about the study, such as the various characteristics of the studies included in the study and their relevance to the research question. The following types of information was extracted: author(s), year of publication, source origin, country of origin, aims, purpose, study population and sample size (if applicable), methodology, intervention type and comparator (if applicable), concept, duration of the intervention (if applicable), how outcomes are measured, and key findings that relate to the review question (Khalil et al., 2016). Table 2 below presents part of the results of the studies included in the final review.

#### Data analysis

A thematic analysis was thus conducted guided by Braun and Clarke's (2006) six steps: namely, familiarisation of the data, generating codes, searching for themes, reviewing the themes, defining, and naming them, and then reproducing the report. Two themes resulted: gendered addiction patterns and substance behavioural addictions (see Table 3). For credibility and trustworthiness of the themes, a second reviewer was consulted, and disagreements regarding the themes were catalogued.

### Results and Discussion

#### Geographical distribution of studies

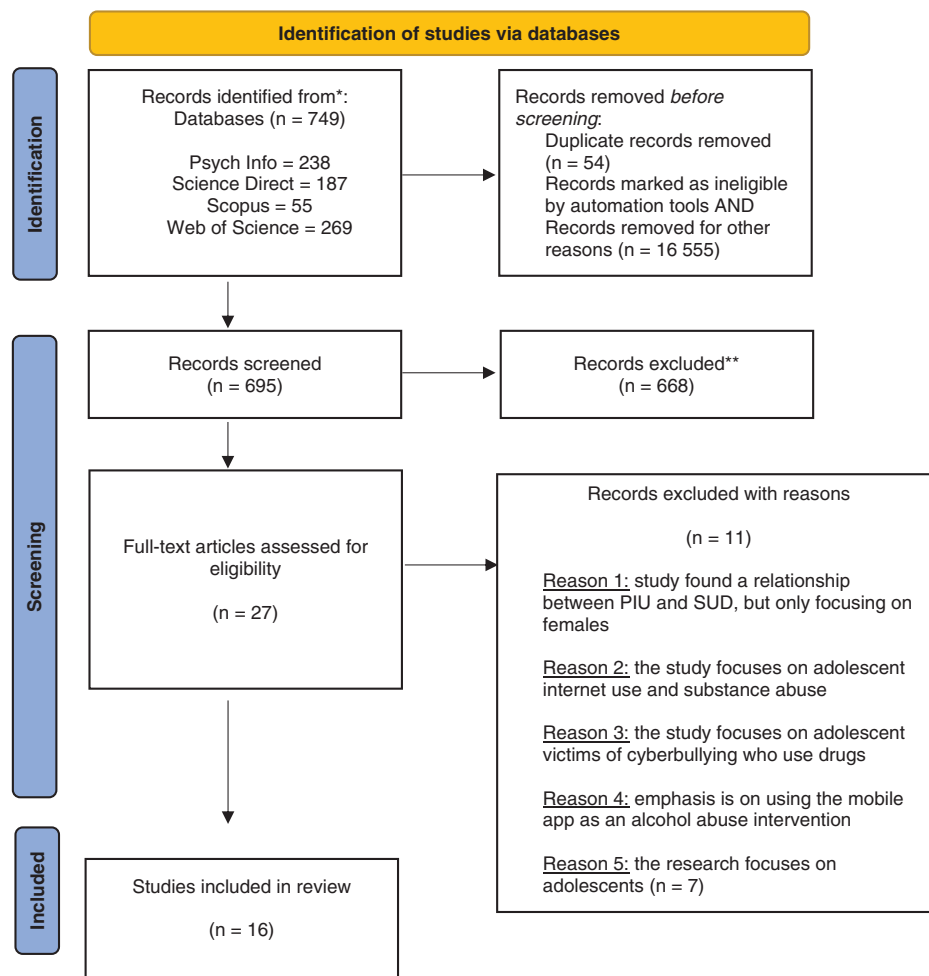
Most of the included study samples were from Europe, the United States of America and Australia. As indicated in Table 4, studies from Australia contributed 5% to the entire sample. Most studies sampled from European countries like Poland, Hungary, Sweden, Italy, Spain and Germany. China and South Korea were broadly sampled by one study. Some studies included samples from two or more countries such as Canada and North America. The remainder of the studies were from United Kingdom. Note that the country total does not concur with the total articles as some articles sampled from more than one country.

#### Study design

Generally, studies concerned with PIU and SUD mainly utilise quantitative methods (95%) and one qualitative article. The included samples varied in size from 6419 participants of which the mean sample size was 2061,

**Table 1.** Inclusion and exclusion criteria per study variable

Variable	Inclusion	Exclusion
Study design	Qualitative, quantitative, mixed-method, reviews	Opinion papers, interviews, theoretical papers
Publication years	2014–2023	Prior to 2014
Participants	Men	Persons other than men
Language	English	Other languages
Source type	Academic articles	Other sources



**Figure 1.** Problematic internet use and substance use disorder among men: a scoping review

with 612 participants being the most frequent sample size. Participant samples consisted of 52% females and 48% males. The most common age group sampled was 21 to 45.

### **Gendered addiction patterns**

Concerns about PIU prevalence have grown in recent years as more and more studies have been conducted to clarify the condition's various symptoms and contributing variables. In all the demographic groups studied, adult men have emerged as a notable group that exhibits problematic internet usage patterns and vulnerability to PIU. In addition to determining the extent of the problem, knowing the prevalence rates of PIU among adult men is important for developing focused interventions and preventive measures that specifically address the challenges that they experience. Thus, it has been found that men display higher levels of PIU than females (Akpınar Aslan et al., 2021; Estevez et al., 2017; Hwang et al., 2014; Marazziti et al., 2020; Tomska et al., 2022). Similarly, a study conducted by Kozybka et al. (2023) found significantly higher levels of PIU in males than females. Sayeed et al., (2021) reported significantly higher PIU in males than female respondents (see also Zewde et al., 2022). Higher rates of PIU in men could be attributed to the competitive nature of certain online gaming environments (Su et al., 2020), as men are more likely to present with IGD and

women with social networking sites, such as Facebook and Instagram.

Substance use disorders affect men and women differently, although the prevalence has been reported to be higher in men (Compton et al., 2007; Da Fonseca et al., 2021; McHugh et al., 2018). Research has shown that men are more likely to engage in heavy and binge drinking compared to women, which contributes to the higher prevalence of substance use disorders in men (Grant et al., 2015; Keyes et al., 2011). Despite the growing number of studies focused on the sex-related differences in drug addiction, few studies have investigated the potential differences in the behaviour of men and women when it comes to non-substance related addictions (Fattore et al., 2014). Regarding substance use, women who are at risk for substance abuse are more prone to using substances at a faster rate than men, leading to the development of an addiction.. This is because of the circulating ovarian hormones in females, where short-term exposure to estradiol can contribute to the faster acquisition of substances by women. Furthermore, according to Fattore et al. (2014), women who attempt to stop using substances such as cocaine or amphetamine experience withdrawal symptoms more unpleasant than men, as with smoking. However, men experience more unpleasant symptoms when attempting to quit alcohol. Males are more likely than females to engage in risky behaviours such as experimenting with

**Table 2.** Studies included in the review

Author(s)	Title	Journal name	Design	Sample	Country	Age	Findings
Akpınar Aslan et al. (2021)	Prevalence of risk for substance-related and behavioral addictions among university students in Turkey	Addicta: Turk J Addict	Quanti	612 female and male students	Turkey	18 and above	The study revealed varying rates of addictive behaviours among students. The prevalence of potential alcohol dependence, pathological internet use, and potential smartphone addiction stood at 2.0%, 11.4%, and 24.7%, respectively. Only 0.3% reported severe problems with substance use. Different addiction types exhibited distinct gender and age patterns. Men showed higher rates of potential alcohol dependence, pathological gambling, gaming addiction, and sex/pornography addiction. Meanwhile, mild nicotine addiction, PIU, possible smartphone addiction, food addiction, and gaming addiction were more common in the 18–24 age group compared to older students.
Lyvers et al. (2020)	Disordered social media use and risky drinking in young adults: Differential associations with addiction-linked traits	Aust J Psychol	Quanti	143 females and males	Australia	18–35	Disordered social media use was significantly negatively correlated with age and social desirability and was significantly positively correlated with risky drinking. Present results point to similarities and differences in addiction-linked traits when comparing disordered social media use to risky or problematic substance use. Disordered social media use was predicted by narcissism, reward sensitivity, and impulsivity, whereas risky alcohol use was predicted by narcissism, alexithymia, and impulsivity.
Kotyuk, et al. (2020)	Co-occurrences of substance use and other potentially addictive behaviors: Epidemiological results from the psychological and genetic factors of the addictive behaviors (PGA) study	J Behav Addict	Quanti	3003 females and males	Hungary	Mean age 21 years	Associations were found between: (i) smoking and PIU; exercising; eating disorders; and gambling (ii) alcohol consumption and PIU, problematic online gaming, gambling; and eating disorders; and (iii) Cannabis use and problematic online gaming and gambling.
Baroni et al. (2019)	PIU in drug addicts under treatment in public rehab centers	World J Psychiatry	Quanti	183 females and males	Southern Italy		The findings indicated that PIU is more common in subjects taking cocaine and cannabis than in subjects taking opioids or alcohol, and that the also affected by pathological gambling disorder. This suggests a favoring role of stimulant drugs towards the development of behavioral addictions. The relationship between time spent online and body mass index indicates that Internet use might be a factor that promotes weight gain and obesity. Addiction prevention should take into consideration PIU, which currently represents a worldwide epidemic.

(Continued)

**Table 2** (Continued)

Author(s)	Title	Journal name	Design	Sample	Country	Age	Findings
<a href="#">Tomska et al. (2022)</a>	Emotional state of young men in relation to PIU	Int J Environ Res Public Health	Quanti	500 men	Poland	18–30	It has been shown that males aged 15–25 are more likely to become addicted to the internet or online games—symptoms of addiction affect 21.4% of male gamblers and 9.1% of the women. Our research shows the age range 13–30 years, known to be the most vulnerable to PIU and the related dangers. There was a correlation between the severity of mild depression symptoms and the occurrence of anxiety, verbal and physical aggression, and PIU.
<a href="#">Estevez et al. (2017)</a>	Attachment and emotion regulation in substance addictions and behavioral addictions	J Behav Addict	Quanti	472 females and males students	Spain	13–21	Findings demonstrated that emotion regulation was predictive of all addictive behaviors assessed in this study (alcohol and drug abuse, gambling disorder, video game addiction, and PIU). In addition, gender differences were found, with females scoring significantly higher in maternal and peer attachment, whereas males scored significantly higher in gambling disorder and video game addiction.
<a href="#">Marazziti et al. (2020)</a>	Characteristics of internet use amongst Italian university students	Psychiatr Danub	Quanti	3324 females and males	Italy	23.4 ± 5	Men were more involved in online recreational activities, whereas women seemed more attracted to instant messaging and, generally, to social networks. PIU was significantly more prevalent in men than women. The findings of the present study indicate that the use of Internet through new technologies may exceed its real utility amongst Italian university student, with some sex-related differences. Men seem more prone to use Internet for passing time and women for social relationships. Men are also at risk of developing PIU. Again, Internet use might be a basic vulnerability factor of increasing weight gain and obesity amongst young people. No information was gathered on emotional distress, or associated mental disorders, substance abuse and disturbed behaviours that are currently under investigation.
<a href="#">Henzel and Hakansson (2021)</a>	Hooked on virtual social life. Problematic social media use and associations with mental distress and addictive disorders	PLoS One	Quanti/ Cross-sectional study	2118 females and males	Sweden	16–50 & above	Problematic social media use was associated with younger age, time spent using instant messaging services, and mental distress, but not with education level, occupational status, or treatment needs for alcohol or drug problems. Clear difference across age groups, with the highest percentage of problematic internet users in the younger groups (16–39 years). There have been discoveries regarding associations and interrelationships between addictive online behaviour and use of psychoactive substances, in a number of European countries.

(Continued)

**Table 2** (Continued)

Author(s)	Title	Journal name	Design	Sample	Country	Age	Findings
<a href="#">Singh et al. (2022)</a>	Characterizing PIU in a sample of heavy drinking emerging adults	Psychol Addict Behav	Longitudinal study	730 females and males	Ontario	19–22	PIU showed no association with SUD but was positively associated with MHD.
<a href="#">Hwang et al. (2014)</a>	Shared psychological characteristics that are linked to aggression between patients with Internet addiction and those with alcohol dependence	Ann Gen Psychiatry	Quanti/Control Trial	90 males	South Korea		IA and AD are similar in terms of personality, temperament, and emotion, and they share common characteristics that may lead to aggression. Our findings suggest that strategies to reduce aggression in patients with IA are necessary and that IA and AD are closely related and should be dealt with as having a close nosological relationship.

**Table 3.** Emergent themes

Themes	Notes
<b>Theme 1</b>	Gender differences in addiction patterns Men display higher levels of PIU than females Vulnerability to PIU across age groups
<b>Theme 2</b>	Associations between substance use and behavioural addictions Associations between smoking, alcohol, cannabis, cocaine and PIU Neurological similarities between substance use and behavioural addictions

**Table 4.** Geographical distribution of sample

Location of studies	Total
Poland	2
Italy	2
Hungary	3
Sweden	3
South Korea	1
North America	2
Canada	1
Spain	2
Germany	1
Turkey	1
Australia	2

\*Note. Locations listed as stated by sampled articles.

drugs, and if susceptible to substance abuse, they are drawn into a spiral that leads to addiction ([Becker et al., 2012](#)). Although the structures and processes involved in the reinforcement of positive and negative stimuli are similar in both males and females, the sex differences in how these neural systems are activated and connected are believed to underlie the development of addiction ([Becker et al.,](#)

[2012](#)). Thus, it is evident that the neurobiological make-up of men and women may contribute to these gender differences in addiction. However, an in-depth exploration of the different mechanisms and neural pathways involved is beyond the scope of this study.

#### **Substance use and PIU behavioural addictions**

Men who engage in substance use are more likely to have PIU, and *vice versa*. Multiple studies by authors such as [Baroni et al. \(2019\)](#), [Henzel and Hakansson \(2021\)](#), [Kotyuk et al. \(2020\)](#), and [Lyvers et al. \(2020\)](#) share consistent results regarding the positive association between PIU and SUD in men. Numerous studies have investigated the connection between PIU and substance usage, such as incusing use of cocaine, alcohol, cannabis, and smoking ([Henzel and Hakansson, 2021](#); [Kotyuk et al., 2020](#); [Lyvers et al., 2020](#); [Singh et al., 2022](#)). Substance abuse and PIU also have common underlying causes ([Sinclair et al., 2016](#)). Inefficient self-control appears to be a common factor leading to maladaptive behaviour and an inability to resist both behavioural and substance-related addictions ([Kozak et al., 2019](#)). There is a wide range of neurobiological evidence that can be used to inform the debate about the development of behavioural addictions. These include structural brain imaging, functional brain imaging, and cognitive assessment. On the structural level of the brain, it has been revealed that there is a link

between internet gaming and reduced grey matter density in various regions of the brain (Chamberlain et al., 2016). In some cases, the development of behavioural addictions can be triggered by dopaminergic agents used for treating other conditions, such as Parkinson's Disease and restless leg syndrome (Chamberlain et al., 2016). This is consistent with Chamberlain et al. (2016) and Sinclair et al. (2016) who reported that available psychobiological data on chemical and behavioural addictions comes from studies on the molecular biology and neural circuitry of substance use disorders. It begs the question of whether participating in one kind of addictive behaviour makes one more vulnerable to the other. Considering that individuals can develop multiple addictive behaviours, it is important to understand the underlying factors that contribute to the development of these behaviours.

### Implications for Future Research

Further research is needed to fully understand the interplay between PIU and substance abuse disorders. For instance, personality types also contribute to the differences in online behaviours (Kosinski et al., 2014). Introverted individuals may prefer to engage in more passive activities such as reading or observing, while extroverted individuals may be more likely to actively participate in online discussions and seek social validation. Moreover, internet use is associated with loneliness and can help escape and relieve stress for a short period of time to cope with the psychological distress of the pandemic (Singh et al., 2021). Further, age-related PIU and SUD have been reported (Akpınar Aslan et al., 2021; Henzel & Hakansson, 2021; Singh et al., 2022; Tomska et al., 2022). For instance, Henzel and Hakansson (2021) highlights a higher percentage of problem users are in the younger demographic, particularly those aged 16–39 years. Giotakos et al. (2016) reported higher risk for PIU and SUD in middle adulthood in which the overuse of the internet was associated with the development of an addiction to online gambling, followed by substance use in general, and particularly the use of illicit drugs such as heroin and cocaine. This age range captures a significant portion of the population and emphasises the need for targeted interventions for individuals in their late adolescence through early adulthood.

### Limitations of the study and future directions

One of the main criticisms in developing research on problematic internet use or internet addiction is the lack of consensus regarding the diagnosis and conceptualisation of such disorders. Thus, despite the widespread attention paid to the issue, the development of a comprehensive standard of care for individuals suffering from internet addiction has been challenging due to the field's cultural diversity, namely with regard to the variance in the terminology used in academic literature (e.g., internet addiction, PIU, pathological internet use), and secondly, the challenge that arises with different inventories being used in their assessment, making it difficult for results to be generalised to other contexts. A clear understanding and conceptualisation of this behavioural addiction is vital, including the development and utilisation of appropriate and validated diagnostic and screening tools to measure its presence and,

in turn, address it as an emerging mental health disorder. Using validated tools will allow for comparison with other studies. Conducting this scoping review highlighted that there was a paucity of studies employing research designs beyond quantitative methodologies, indicating a clear gap within the body of literature when it comes to PIU. Such a methodological gap in the literature implies a shortage of in-depth exploration of individuals' perceptions, experiences, and feelings in relation to the topic of PIU. Gearing towards the inclusion of more qualitative data would only be possible once a consensus has been reached amongst researchers regarding the classification, aetiology, and progression of PIU. Additionally, it was rare to find literature specifically focusing on men. Within the literature, men were always studied against women, particularly when looking at the gender differences in the development of PIU. Researchers are thus advised to study men and women in their own right, given that they present differently in the kinds of internet related activities they engage in. Focus should therefore be given to the assessment of PIU by distinguishing the two different forms from each other, namely the generalised and specific forms of PIU.

### Conclusion

It is evident that both PIU and substance abuse disorders are gendered. The first theme highlighted that although there are contrary findings on whether males or females have the highest prevalence of PIU, there is substantial evidence that also suggests that men may have the highest prevalence. However, the prevalence rates appear to be dependent on the types of activities men and women engage in when online. The second theme highlighted the interconnected nature of behavioural addictions, particularly internet addiction, with substance-related dependencies, implying the presence of common underlying risk factors, further confirming the idea that addictions have psychological causes. In addition to the interconnectedness of behavioural and substance related addictions, multiple studies shared consistent results regarding the positive association between PIU and SUD. It made sense to examine both these phenomena simultaneously because of their interrelatedness and the mere fact that they share similar psychosocial characteristics. In conclusion, there is a bidirectional relationship between PIU and SUD, which highlights the complex interplay between the two phenomena, necessitating a need for interventions that can address both at the same time.

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reviewed the results and approved the final version of the manuscript.

**Availability of Data and Materials:** Data openly available in a public repository available at ([www.ru.ac.za](http://www.ru.ac.za)) (accessed on 20 March 2025).

**Ethics Approval:** Since this is a review study, it did not acquire ethical review.

**Conflicts of Interest:** The authors declare no conflicts of interest to report regarding the present study

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