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Case Study

# Exploring the Reasoned and Reactive Pathways for Substance Use by Adolescents Living in Nigerian Urban Slums Using the Prototype Willingness Model: A Case Study

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## Abstract

The process of initiation and continued use of substances among adolescents in Africa is understudied despite the high prevalence of substance use among them. Understanding the process that leads to the initiation and subsequent use of substances by adolescents is pivotal for focused and context-specific interventions to address the problem. This exploratory qualitative study used case study design to explore the life histories of three out-of-school adolescents with established substance use from selected slum communities of Ibadan, Nigeria. Content analysis was used for data analysis based on the constructs of the Prototype Willingness Model (PWM). There were two males and a female adolescents aged 15 and 18, and 17 years respectively. The initiation and subsequent use of substances followed both the reasoned and reactive pathways of the PMW. For the reasoned construct, there was a low perception of risk for the negative effects of substance use and both their peers, as well as younger family members used substances. Also, the reactive construct showed that prototype favorability of substance users was important for the initiation and subsequent substance use by the adolescents. Substance use was initiated in social settings and with peers. The PWM explained both initiation and subsequent substance use by these adolescents. Further studies with quantitative data could provide more details about the process of substance use based on PMW by adolescents in Nigeria.

**Key Words:** Adolescent substance use, Prototype Willingness Model, Dual systems model, Behavioral willingness, Behavioral intention

## INTRODUCTION

Nigeria is home to one-third of all adolescents in developing countries (UNICEF, 2011) and a significant proportion are now living in urban slums. The stressful nature of such a disadvantaged neighborhood exposes adolescents to multiple problems such as poverty, family breakdown, increased rate of infections, violence, crime, suicide, child abuse and neglect. All these subject adolescents in slums to various health risks (Wade *et al.*, 2016; Wiafe *et al.*, 2021), in addition to the stress that comes with the transition from childhood to adulthood. Therefore, adolescents in urban slums are faced with more problems because of this double barrel pressure and may navigate adolescence differently compared with their counterparts residing in the rural and other parts of urban communities.

Substance use has continued to be a major public health concern globally and recently, the statistics are worsening in many developing countries, almost assuming an epidemic proportion. In Nigeria, the prevalence of substance use among adolescents is high with some variations that showed higher use of alcohol among adolescents in the south and higher use of cannabis and other drugs in the north (Vigna-Taglianti *et*

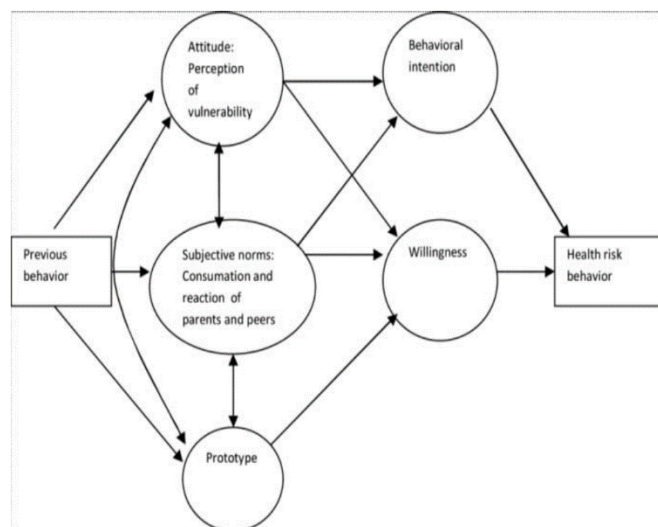
*al.*, 2019; Mehanović *et al.*, 2022). The period of adolescence is pivotal with regard to drug use because most adults who have substance addiction problems started drug use in adolescence. The recently reported prevalence of substance use among Nigerian adolescents is highly variable with rates as low as 17.3% among in-school adolescents (Obadeji *et al.*, 2020), and as high as 81.7% among female adolescents who were commercial sex workers (Olofinbiyi *et al.*, 2016). A closer look at the earlier studies shows that the prevalence of substance use was higher among out-of-school adolescents compared with in-school adolescents (Abdulmalik *et al.*, 2009; Abubakar-Abdullateef *et al.*, 2017) and this could be due to different reasons such as the higher peer pressures that out-of-school adolescents have to handle due to the more unoccupied time that they have, especially when there is no adult supervision. Adolescent substance use has also been associated with being out-of-school and poverty in sub-Saharan Africa (Peltzer, 2009).

Most of the research about adolescent substance use in Nigeria and many sub-Saharan African countries have dwelt on the description of the problem, especially its epidemiology. While epidemiological studies are a good start in understanding the health problem as they provide useful baseline statistics, there

is a need to go a step higher by exploring the processes that lead to the commencement of substance use by these adolescents. This will be an important step towards the uncovering of important links and cues that can guide the design and application of evidence-based interventions not only for the prevention of substance use among adolescents, but also for the provision of effective therapy for those already with problematic substance use. Also, adolescents who dwell in urban slums are hardly included in research about adolescent substance use compared with their counterparts in other urban settings (Atilola *et al.*, 2013) and rural areas (Mbachu *et al.*, 2020). There are also more studies about substance use among in-school adolescents (Idris and Sambo, 2009; Manyike *et al.*, 2016; Odukoya *et al.*, 2018; Olashore *et al.*, 2018) compared with out-of-school adolescents in developing countries despite the report of more predisposing factors to the use of substances among the latter. The peculiar socioeconomic pressures that adolescents in urban slums face (Blum, 2014) may alter their experiences with substance use. Findings from the systematic review by Jacobs *et al* on adolescent substance use in Nigeria showed that none of the studies reviewed used sound theoretical framework for their investigation (Jacobs *et al.*, 2020). This could make the design of focused solutions and appraisal of their effectiveness difficult and may explain the failure of earlier interventions to effectively address adolescent substance use in sub-Saharan Africa (Morojele *et al.*, 2021). This study therefore aimed to describe the reasoned and reactive pathways, which drive substance use by out-of-school adolescents living in Nigerian urban slum communities using the Prototype Willingness Model (PWM).

**The Prototype Willingness Model:** The dual systems model (Casey *et al.*, 2008; Steinberg, 2008) has been one of the most effective frameworks for conceptualizing the mechanisms underlying adolescent risk behavior. This approach hypothesizes that adolescents' elevated rates of risky behavior stem from a mismatch between reward-driven behavior and the ability to self-regulate. This is because of both structural and functional imbalances in the maturation of the cognitive control and incentive processing parts of the neural systems. The cognitive control system is involved in functions such as decision making, judgment, and response inhibition (Casey *et al.*, 2008), whereas the incentive processing system responds to emotionally arousing and rewarding stimuli (Van Leijenhorst *et al.*, 2010). According to the dual systems model, the incentive processing system matures earlier than the cognitive control system, leading to imbalances between reward-driven behavior and the ability to self-regulate such behavior (Casey *et al.*, 2008; Steinberg, 2008). This explains why the correlation between the intention to perform a behavior and the actual performance of the behavior is weak in adolescence (Gerrard *et al.*, 2005). The Prototype Willingness Model (PWM) shown in Figure 1 is an example of the dual system model that has been used to explain some adolescent behaviors, including alcohol use (Kalebić and Martinac, 2016) and smoking (Gerrard *et al.*, 2005). The model assumes that in addition to the theory of reasoned action (the reasoned pathway) which explains the logical pathway for decision making in adults (Gerrard *et al.*, 2008), adolescents are also influenced by the social circumstances (reactive pathway) they are faced with while making their decisions (Romer *et al.*, 2017). The reactive pathway consists of risk

prototype (images of people who are engaged in the risky behavior) and the willingness of the adolescents to engage in the behavior, which shows an openness for the right opportunity to engage in the risky behavior (Gerrard *et al.*, 2008). The reactive pathway results in decisions that are not intended or planned, and it explains the logic behind adolescents' impulsivity. The reasoned pathway consists of attitude towards the behavior and the supportive subjective norm (what others in one's social circle think of the risky behavior) which culminates in the intention to carry out the behavior (Gerrard *et al.*, 2005) as shown in Figure 1. Attitude in this context is defined as the perception about vulnerability to the negative consequences of the risky behavior of interest (Kalebić and Martinac, 2016).



**Figure 1:** The Prototype Willingness Model (Gerrard *et al.*, 2005; Kalebić M. B. and Martinac D. T., 2016)

**MATERIALS AND METHODS**

**Study Area:** This study was carried out in Òjé and Yemetu communities in Ibadan, a city located in southwest Nigeria. These communities were selected because they have a high population of the out-of-school adolescents, and the communities have both a good blend of urban and semi-urban settlements, as well as a mixture of socio-economic classes. Christianity and Islam were the dominant religions, but some traditionalists still exist.

**Study Design and Study Participants** This was an exploratory qualitative study using case study design in which data was obtained from three out-of-school adolescents with established substance use and who live in slum communities using life history. The index adolescent was identified through the help of one of the community members and the others were recruited through snowball technique.

**Data Collection Instruments:** Data about the life history of the adolescents regarding substance use were collected using interview guides written in Yoruba language which was developed based on the study objectives and information from the review of literature. The questions provided data about their vulnerability to substance use and its consequences, and

their perception of the acceptance of substance use by their significant others (subjective norms). These two gave information about how the reasoned pathway functioned for substance use by the adolescent, leading to the planned use of substances. There were also questions that explored the adolescents' image of people who use substances (prototypes) and their identification with those images, leading to a willingness to use substances in opportunistic settings.

**Data collection procedures:** Three research assistants conducted the interviews: a facilitator, a note-taker/ recorder and a timekeeper. Data collection took place between September and December 2019. All interviews were conducted in Yoruba language. All interviews were also recorded using three digital recorders simultaneously. The participants were interviewed inside houses close to the places where they meet with their peers to use substances. Participants were interviewed in the mornings only for two reasons. First, they will be available before going to their vocational training centers and secondly, they will not have taken any substance that can influence their responses. Each of the adolescents had four sessions of interview and each session lasted for 45 to 75 minutes. The sessions had to be repeated to obtain full life histories because the adolescents had limited time before starting out for their vocational training centers and this makes them impatient after some minutes of interview. The adolescents were assured of the confidentiality of their responses. The socio-demographic characteristics of the respondents were obtained, and they were introduced to the sessions with a brief description of the research. This was then followed by the questions in the interview guides.

**Data analysis:** The recorded interviews were transcribed verbatim and then translated to English language. Data analysis was carried out using content analysis with the components of the PWM as a guide. The data was read critically, divided into smaller segments and codes were manually developed using a deductive approach based on the components of the PWM independently by two members of the research team. One of the researchers was not present during the interviews. Both coders then reconciled their codes to validate them. Themes were created by selective coding which was used to group the codes into categories with similar characteristics based on the PWM. These themes were then reviewed to ensure that they were robust enough to stand alone and be representative of each component of the PWM.

**Ethical considerations:** The study protocol was approved by the Oyo State Ethics Research Committee (AD 13//479/1590A) and each adolescent provided assent (for those less than 18 years) and consent (for the 18 years old) before participation in the research. The parents were not involved in this study because of the sensitive nature of substance use with the associated stigmatization and to have true responses from the adolescents. The names of the adolescents were not used throughout the interviews.

## RESULTS

Three adolescents were interviewed and identified as adolescent 1 (male, 15 years), adolescent 2 (male, 18 years) and adolescent 3 (female, 17 years) in the result. All were out of school as at the time of the interview. The following themes and subthemes were obtained from the data.

- Prototype of substance users
- Context of Adolescent substance use
  - Initiation of substance use
    - Subsequent substance use
- Perceived vulnerability to substance use
- Subjective norms for substance use

**Prototype of substance users:** The adolescents described those who take substances like them using the words 'family', 'friendly' and 'initiate'. Those who do not take substances were described as 'Lilly livered', 'gullible' and 'not smart'.

**Context of Adolescent substance use:** There were different circumstances which provided the settings in which substances were being used by the adolescents and these are described in the following subthemes.

### *Initiation of substance use*

There was a mix of coercion and experimentation in the initiation of these adolescents to substance use. Each scenario was also unplanned for two of the adolescents but one of them was coerced by his older cousin and his friends into initiating substance use and he initially refused as shown in this quote.

"They usually make jest of me and call me names saying I am rude and arrogant. 'A small boy like you is not submissive when do you want to learn'. One day, after I got the igbo (cannabis) for them, my cousin offered me a stick which I rejected..."

He then planned to try this out, out of curiosity as shown in this quote.

"...they sent me to get it as usual, I decided to try it out myself, so I got an extra wrap for myself. I did not like it at first, so I stopped trying for a while...I decided to start again... Ever since then I have been a regular user of Igbo." Adolescent 1

The other two adolescents were initiated into substance use out of curiosity and experimentation in school and a friend's house respectively. The second adolescent had this to say:

"I had my first puff then, I wanted to feel how it was like to smoke, I was just curious about the fun they get from it, from the way they hyped it." Adolescent 2

The same adolescent also initiated some substances in a social setting as shown below.

"I moved around with them a lot, so, I was invited to a party and that was where I took cigarette and skushi for the first time." Adolescent 2

### *Subsequent substance use*

Adolescents 1 subsequently continued taking substances both as a planned activity and in social settings as seen in this quote.

"There was a day we went for a birthday party with my friends, so we were at a corner enjoying life with Igbo (cannabis) and ogogoro (a local gin)." Adolescent 1

Adolescent 3 also started planning to use substances and she was a social user as well just as shown in this quote.

"I do drugs most times I am lonely and when I am with friends." Adolescent 3

**Perceived vulnerability to substance use:** It was obvious that all the adolescents did not perceive their vulnerability to the negative consequences of substance use as each currently enjoyed their present use in the face of the risky consequences they had experienced from substance use. For example, all the adolescents believed they were already addicted to the substances that they take as seen in these quotes.

“I was addicted to it already, and if I didn’t smoke anything I don’t get completely okay, I will be like, something is missing from me.” Adolescent 2

“There was a time I tried to reduce it to twice a week but each time I tried to stop it the more I keep going back to it.” Adolescent 1

One of the risky consequences they have been exposed to is risky sexual behavior, including multiple sexual partners and the non-use of condoms during sexual intercourse while under the influence of the substances as seen in these quotes.

“I don’t mind if they use condom or not...sometimes they don’t use at all.” Adolescent 3

“When I finish taking alomo (alcoholic drink) and I smoke igbo (cannabis) ... me and my friends use to visit olosho (prostitutes)...sometimes, it is after the sex I will remember that I didn’t use condom...” Adolescent 1

The female adolescent had also been gang raped by strangers after taking substances in the past as shown below.

“There was a time I got too high and I lost self-concentration...after a lot of Ogogoro (local gin) and cigarette, I was taken advantage of by two of the guys I really do not know...” Adolescent 3

There were also instances that the adolescents became involved in violence following the use of substances as seen below.

“I had picked up fights with several people in my street due to the fact that I was high. I was almost arrested...I injured someone during the fight... but thank God he didn’t die.” Adolescent 2

“That’s how he came and I slapped him to get away and gave him a punch but I did not really know how I did it because I was high and under the influence of alcohol...we injured him and he was bleeding.” Adolescent 1

The use of substances was also affecting the cognitive and social functioning of the adolescents as shown in this quote.

“I started to forget things easily...I no longer concentrate, sometimes I am out of thought and even the good friends I had during school had left me.” Adolescent 1

**Subjective norms for substance use:** None of the parents of the adolescent supported their use of substances. Adolescent 3 had been hiding her drug use from her parents while Adolescent 1 and 2’s mothers were sad when they got to know about their use of substances. However, the friends and some younger family members of the adolescents also take substances and were the ones who introduced the adolescents to the substances. These are shown in the quotes below.

“I got introduced to substance use by a boyfriend I casually dated.” Adolescent 3

“I never knew there are other drugs people take until some of my friends at the park started doing them. So, I joined them...” Adolescent 1

“My cousin used to send me to get Igbo (cannabis) for him and his friends.” Adolescent 1

The process of substance use of the three adolescents in this study had both reactive and reasoned components of the PWM just as reported for other risky behaviors of adolescents in other parts of the world in earlier studies (Vaughn and King, 2016; Rahimi and Javadi, 2018; Van Ouytsel *et al.*, 2020). This implies that despite the significant variations in cultures and socioeconomic background, it appears that the decision processing about participation in risky behaviors by adolescents is similar.

It was not surprising that the prototype that the adolescents provided showed favorability and it can explain the reason why they were steady substance users. Prototypes have been identified as strong predictors of willingness (Todd *et al.*, 2016) and so, describing substance users as ‘family’, ‘smart’ etc. showed that the adolescents had a favorable image of who a substance user was, and this would have made them to contemplate and eventually initiate the use of substances (Gibbons and Gerrard, 2016). However, these prototypes contrast with the desire of the adolescents to stop taking substances. This contrast may be because the cessation of substance use obviously is not a risky behavior and will likely take the path of being intentional which will be a reasoned pathway to action.

The effect of environmental influences on the initiation and continued use of substances cannot be ignored (Handley *et al.*, 2015). A close look at the context surrounding the initiation and subsequent use of substances by these adolescents showed social influences in both instances. Social influences were identified to be strong predictors of willingness (Gerrard *et al.*, 2008) and they have been central to different models used to explain adolescent substance use (Graham *et al.*, 1991). Willingness is also a strong predictor of initiation of a behavior (Armitage and Conner, 2001). It is, therefore, logical to conclude that social influences are crucial to adolescents’ initiation of risky behaviors. Two of the processes of social influence on adolescent substance use can be seen among the studied adolescents. For adolescent 1, active offers repeatedly by his cousin and his friends was one process. These people also modelled substance use to him as the adolescent watched them take substances frequently. Both Adolescents 2 and 3 also had active offerings by friends and modelling by friends. These events preceded the initiation of these adolescents to substance use.

All the actors in social influence already discussed existed in the adolescents’ environment. A strong relationship has also been established between willingness and behavior in high-risk neighborhoods and these adolescents were living in urban slums which are high-risk environments. The attempt to cope with the stress associated with living in such a neighborhood can partly explain their willingness to take substances. For adolescents 2 and 3, the initiation was unplanned as their contact with substances occurred with their friends in somewhat social settings and out of curiosity (which makes adolescents experiment with risky behaviors), they decided to try it out. Curiosity has been defined in the context of PWM as the willingness in the presence of a favorable prototype and the belief that others are engaging in the behavior (subjective norm) (Graham *et al.*, 1991). The adolescent will also be optimistic in engaging in the behavior because of the belief that they can get away with the behavior. However, due to the anatomical and physiological immaturity of the adolescent brain, they are more likely to become dependent on the

## DISCUSSION

substances that they experiment with compared with the matured brains of adults (Lubman *et al.*, 2007). Adolescent 1 was coerced into initiating substance use by his older cousin and his friends who kept teasing the adolescent until he started contemplating how to use substances. He wanted to prove the prototype of being a 'big boy' by using substances than being a 'small boy' which is not a desirable prototype that the cousin was using to describe him for not using substances. Even though adolescent 1 contemplated using substances before he initiated it, he had the image of a substance user which he got from his cousin and was already willing to use it. He thereafter seized the opportunity to try it when the opportunity presented itself. The subsequent substance use for all the adolescents was with their friends and this is not surprising because having close friends who use substances has been associated with adolescents' substance use (Glaser *et al.*, 2010). This is also another evidence that substance use for these adolescents was a social event that often occurs in social settings with friends, emphasizing the reactive pathway of adolescent substance use. These show that the initiation of substance use was prompted by coercion and experimentation in the background of social influences and some identified prototypes which are components of reactive pathways of the PWM.

Although the adolescents in this study were already manifesting evidence of substance use dependence (as evidenced by involvement in violence, inability to concentrate at work, risky sexual behavior, and inability to control use), they were oblivious of the consequences of their substance use. This was because they still spoke highly of their substance use as well as those of their friends and as they were only mindful of some immediate effects that they were already experiencing. Unfortunately, the adolescent's brain is more susceptible to the neurotoxic effects of substances compared with that of an adult and this explains the reason why adolescents who use substances are more prone to intoxication and social misbehavior following substance use (Hall *et al.*, 2016). They are also more likely to develop substance use dependence because of their immature brains (Lubman *et al.*, 2007; Hall *et al.*, 2016) with the attendant short and long term consequences. Loss of concentration is one of the important short-term consequences already being experienced by adolescent 1. Lack of concentration will hamper learning for adolescents who are at the critical stage of acquiring either formal or informal education that will form the foundation of their career. Their productivity in adulthood can be truncated or reduced due to the inability to concentrate on learning from substance use. Substance use has also been associated with a reduced tendency to plan for the future (Cheong *et al.*, 2014). Overall, this can lead to poverty and on a large scale, adverse effects on a nation's economic state. All these show the importance of prevention of substance use initiation by adolescents.

There was a contrast in the approval of substance use by the parents of the adolescents and their peers. While all their parents disapproved of their use of substances, all three adolescents had friends who approved of substance use. Parental approval of substance use predicts its use by adolescents (Whitesell *et al.*, 2013), but this was not the case in this study. Also, parental non-use of substances is expected to result in adolescent's non-use (Bears Augustyn *et al.*, 2020) but it appears that the peers of the adolescents in this study had a stronger influence on the adolescents' decision to use substances. Peers have been shown to play significant roles in

adolescents' initiation and sustained use of substances (Beyers *et al.*, 2004) and a Nigerian study reported that peers' substance use was significantly associated with adolescents' substance use (Namadi, 2016). Peer pressure has a significant impact in early and mid-adolescence when adolescents seek the approval of their peers as well as acceptance. This can explain the departure from family norms which is seen in this study and the taking up of substance use which their peers are involved in. This stresses the need for parents to actively communicate expectations about substance use to their adolescents and this can be part of the teaching of family values which should be imparted before adolescence. When this is intentionally carried out, it can keep adolescents from substance use as unclear parental expectations about substance use contributes to adolescents' substance use.

This study attempted to explain adolescent substance use among Nigerian adolescents using the PWM. To the best of our knowledge, this is the first study from Africa to explain adolescent substance use with PWM despite the high population of adolescents in the continent and the increasing burden of adolescent substance use in the region that has been described by different authors. The findings can guide focused interventions, for example, supporting parents to communicate clear expectations about substance use, the use of peer educators to prevent the initiation of substance use and emphasizing the consequences of substance use to adolescents. This can go a long way in addressing the increasing prevalence of substance use among African adolescents. Secondly, it provided a clear understanding of the processes and interplay of both reasoned and reactive pathways, showing the need to develop adolescent-specific interventions which will take into consideration the two pathways in their design.

However, there are some limitations in this study. First, a case study design with qualitative data was used which limited the number of adolescents studied. Even though this provided depth in the study as the context was explored, a larger sample with quantitative data can provide concrete predictive values for the different components of the PWM. This study was also conducted among adolescents in selected urban slum communities in southwest Nigeria. A larger study area can bring out some nuances which can further explain the roles of the reasoned and reactive pathways to adolescent substance use.

## CONCLUSION

In conclusion, the PWM explained substance use by the three adolescents in this study as each of its components was represented in the process of the decision of the adolescents to use substances. However, the adolescents did not appreciate their vulnerability to the consequences of substance use. This exploratory study is a good baseline to build subsequent research which can provide further details about the pathways to adolescent substance use, as well as guide focused and informed interventions to control substance use by adolescents in Nigeria and other sub-Saharan African countries.

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