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Research Article

Exploring the Nexus Between Tramadol Abuse and Psychosocial Well-being of Students: Evidence from Junior High Schools in Ghana

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Abstract

Tramadol misuse has emerged as a critical social and public health conundrum among adolescents in Ghana, with limited evidence on its prevalence and psychosocial implications at the Junior High School (JHS) level. This cross-sectional survey was therefore conducted in JHS across 16 circuits in the Sagnarigu Municipality. Structured Questionnaire (SQ) was employed to collect the data from 60 students randomly sampled for the research. The internal consistencies of the items in the questionnaires was tested using Cronbach Alpha formula which yielded α=.81 which was acceptable for the research. The data were analyzed using inferential statistics such as chi-square tests, logistic regression analysis, and multivariate analysis of variance (MANOVA) to examine the prevalence, predictors, and the impact of tramadol abuse on psychosocial outcomes such as behavior, mood, interpersonal relationships, and anxiety. The findings revealed that 43.3% of respondents reported tramadol use, with varying frequencies from occasional to daily. Logistic regression identified age ($p < 0.01$) and grade ($p < 0.05$) as significant predictors of tramadol use. Chi-square tests discovered a significant correlation between tramadol use and interpersonal relationship changes ($p < 0.001$) as well as increased anxiety levels ($p < 0.05$). Similarly, the MANOVA results demonstrated that tramadol uses significantly affects behaviour, mood, relationship dynamics, and anxiety level of users (Wilks' $\lambda = 0.3855$, $p < 0.001$). Based on these findings, it has been recommended that the GES support school-based intervention programmes that incorporates drug education into the school curriculum for awareness creation, family-centered intervention that empower parents with knowledge and skills to monitor their children and communicate effectively to them about tramadol consumption risks, strengthening drug regulations by law enforcement agencies to cut the supply of tramadol drugs, and provision of counselling, psychosocial support and rehabilitation to tramadol drug addicts.

Keywords

Adolescents, Junior High School Students, Psychosocial Outcomes, Tramadol Misuse, Substance Abuse Prevention

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1. Introduction

Tramadol, a centrally acting opioid analgesic designed for pain relief, has increasingly become a substance of non-medical use among youth populations globally, with alarming psychosocial and health consequences. In Ghana, recent studies indicate substantial prevalence of tramadol misuse among various youth cohorts; for example, a cross-sectional survey of undergraduate students in Tamale found a lifetime prevalence of 17.8% tramadol use, with motives including academic performance enhancement and co-use with other substances [11]. Similarly, among youth in urban informal settlements in the Asokore-Mampong Municipality, non-prescription tramadol use has been associated with socio-economic vulnerability factors including unemployment, migration status, and living alone [11]. Together, these findings suggest tramadol misuse is not merely experimental but embedded within broader behavioral, social, and environmental risk frameworks among Ghanaian youth.

The misuse of tramadol has been linked to deleterious psychological outcomes including mood disturbances, anxiety, relationship disruptions, and behavioural changes. Empirical research in Northern Ghana identified peer pressure, curiosity, and perceived desirable psychological effects – such as heightened energy, euphoria, or improved sexual performance – as both triggers and sustainers of tramadol misuse, often at the cost of mental wellness. Recent research in Ghana has similarly documented that substance use among adolescents is linked to adverse psychosocial outcomes. For example, a cross-sectional mixed-methods study of Ghanaian adolescents aged 10–17 (N = 4,144) found that substance use was significantly associated with emotional problems, academic challenges, and strained family relationships [2]. The study further reports that adolescents who use substances were more likely to cite anxiety, social pressures, and lowered self-confidence, alongside difficulties maintaining school performance and well-being at home, highlighting the importance of assessing the broader psychosocial burden of substance use [2].

Despite this emerging evidence, there remain important gaps. First, many studies focus on older youth or tertiary students, with fewer quantitative analyses among Junior High School (JHS) students – an age where initiation and frequency patterns may differ. Second, while some empirical studies have examined single psychological outcomes (e.g., depression or mood), fewer studies have simultaneously assessed multiple psychosocial domains (behavioural change, anxiety, mood intensity, interpersonal relationships) in relation to frequency of use. Finally, existing studies often lack the statistical power to detect moderate effect sizes in relation to anxiety or mood severity, or do not examine whether frequency of use moderates the severity of psychosocial outcomes. The present study addresses these gaps by examining both prevalence and frequency of tramadol use among JHS students, and correlations between usage patterns and multiple psychosocial outcomes (mood, anxiety, relationship change, behaviour), thus contributing critical new data for prevention and intervention design.

1.1. Problem Statement

Drug abuse has emerged as a critical public health and social challenge in Ghana, particularly among the youth. Evidence from the Ankaful Psychiatric Hospital revealed 1,525 admissions for drug abuse between 2001 and 2005, of which 25% were students [22]. Beyond health implications, drug abuse is strongly associated with antisocial behaviours such as theft, assault, vandalism, truancy, bullying, sexual violence, and disregard for authority. Students often justify substance use as a means of enhancing courage or performance, underscoring the complex motivations behind such practices. The repercussions extend to families and the state, with significant financial and social costs related to care, rehabilitation, and the management of drug-induced mental disorders [22]. Given that students constitute a nation's most productive demographic, the escalation of drug abuse threatens human capital development and long-term national progress.

Tramadol misuse has become particularly alarming within Ghana and the wider sub-Saharan Africa. Although an opioid prescribed for pain management, tramadol has been increasingly diverted for non-medical use. Seizures of tramadol in sub-Saharan Africa have risen dramatically, from 300 kg in 2013 to over 3 tons in recent years, with Ghana, Nigeria, Togo, and other West African states serving as key trafficking hubs [27]. The scale of misuse is reflected in Nigeria, where prevalence is estimated at 54.4%, with most users accessing the drug without prescriptions [30]. In Ghana, the Food and Drugs Authority (2018) has highlighted the proliferation of high-dose tramadol as a pressing social and public health concern. Despite awareness of its adverse health effects, tramadol continues to be misused for physical endurance, psychosocial relief, and enhanced sexual performance. Research indicates perceived benefits such as delayed ejaculation and increased sexual satisfaction [1], and combinations with energy drinks have been reported as common in parts of West Africa [2]. However, there is a paucity of empirical data on the prevalence, psychosocial drivers, and consequences of tramadol abuse among Ghanaian JHS students. This knowledge gap underscores the need for focused research to inform evidence-based interventions and preventive measures tailored to adolescents. Addressing tramadol misuse is therefore crucial not only for safeguarding youth well-being but also for securing Ghana's broader developmental aspirations.

1.2. Research Questions

The following questions provided framework for the re-

search.

1) To what extent do JHS students in the study area abuse tramadol substances?
2) What risk factors contribute to tramadol abuse among Junior High School students in the study area?
3) How does tramadol abuse affect the social and phycological well-being of junior high school students who abuses the tramadol?

1.3. Significance of the Study

The study of tramadol abuse and its psychosocial implications is particularly significant for Junior High School students in Ghana because this age group represents a critical developmental stage marked by heightened vulnerability to risk behaviors. Adolescents in JHSs are typically between the ages of 12 and 15, a period when experimentation, peer influence, and the search for identity strongly shape decision-making. Investigating tramadol abuse in this context allows educators, health professionals, and policymakers to better understand how early exposure to substance use threatens not only students' immediate health but also their long-term academic achievement, emotional regulation, and future trajectories. Such evidence is essential for identifying the most at-risk groups and tailoring interventions that can prevent substance use before it becomes entrenched. Equally important is the link between tramadol abuse and psychosocial well-being, which encompasses students' emotional health, peer relationships, and family adaptation. Research indicates that substance use among adolescents is strongly associated with depression, anxiety, low self-esteem, and difficulties in school adjustment. For JHS students, these psychosocial consequences can lead to absenteeism, declining grades, conflicts with parents or teachers, and social withdrawal, all of which jeopardize their ability to progress academically and socially. By exploring these psychosocial dimensions, the study emphasizes that tramadol abuse is not merely a social or health concern but a multidimensional issue that undermines the holistic development of young people in Ghanaian schools. Furthermore, this study is significant because it provides a culturally relevant and context-specific evidence base for designing school-based interventions. In many Ghanaian communities, conversations around drug abuse remain limited or stigmatized, which hinders early detection and effective prevention. By focusing on JHS students, the study highlights the urgent need for comprehensive health education, peer mentorship programs, and parental engagement strategies that can build resilience and protective factors against substance use. Ultimately, the findings can inform policies within the Ghana Education Service, guide community-level advocacy, and empower schools to become proactive spaces for promoting healthy behaviors, thereby safeguarding the well-being and academic futures of Ghana's next generation.

2. Literature Review

2.1. Theoretical Framework

This study is anchored on the Theory of Planned Behaviour (TPB), developed by Ajzen in the 1980s, which posits that individual behaviour is shaped by three constructs: attitudes, subjective norms, and perceived behavioural control. Attitudes denote an individual's positive or negative evaluation of a behaviour and are considered central determinants of intention and action [9]. In this study, students' attitudes toward tramadol—particularly their perceptions of risks and benefits—are critical in shaping their decision to use the substance. Subjective norms refer to perceived social pressures or approval, encompassing influences from peers, family, and wider society, which may shape students' normative beliefs about tramadol use [28]. Perceived behavioural control relates to the perceived ease or difficulty of performing a behaviour and, in this context, includes access to tramadol, knowledge of its use, and students' perceived ability to regulate or resist consumption [3, 14].

Applying TPB to the study of tramadol use among Junior High School (JHS) students is particularly relevant. Attitudes inform psychological outcomes by shaping perceptions of the drug's impact on well-being, while subjective norms illuminate the social pressures influencing behavioural choices, including peer dynamics and relationship effects [15]. Perceived behavioural control highlights contextual factors such as availability and self-regulation, which may determine the prevalence and frequency of use. Collectively, these constructs provide a robust framework for examining risk factors, including peer influence and family history, that contribute to tramadol abuse among students [7, 21]. By integrating these dimensions, TPB offers a comprehensive lens for understanding the motivations, behaviours, and contextual determinants of tramadol misuse in adolescent populations.

Recent empirical research carried out in West and East Africa underscores the importance of demographic and contextual variables in shaping tramadol abuse among adolescents and young students. Specifically, factors such as living arrangements, migration status, unemployment, family and peer exposure, and the level of parental supervision and education have emerged as critical determinants of non-prescription tramadol use. For example, [24] demonstrated that young people living alone, those with limited family support, and migrants in urban informal settlements in Ghana were more likely to engage in non-prescribed tramadol use. Similarly, [20], in their qualitative exploration of Nigerian youth, highlighted that peer influence, inadequate parental monitoring, and broader socio-economic vulnerabilities significantly heightened the likelihood of tramadol misuse. Complementing these findings, [14] identified peer drug use, family history of substance use, and poor knowledge about tramadol as robust predictors of its misuse among Ethiopian university

students.

The Theory of Planned Behavior (TPB) provides a useful theoretical framework for understanding how such demographic variables exert their influence on substance use behaviors. According to TPB, behavior is primarily determined by intention, which is shaped by three constructs: attitude, subjective norm, and perceived behavioral control [4]. In the context of tramadol abuse, demographic and familial circumstances are likely to operate indirectly by shaping these cognitive determinants. For instance, adolescents from households with lower levels of parental education or weak parental supervision may develop more permissive attitudes toward tramadol use, perceiving it as less harmful or even beneficial. Similarly, exposure to peers or family members who use tramadol reinforces subjective norms**,** leading adolescents to believe that such behavior is socially acceptable or even desirable. Furthermore, contextual variables such as unemployment, age, and living independently may enhance perceived behavioral control by increasing both the perceived availability of tramadol and the belief in one's capacity to use it without immediate consequences. Collectively, these TPB constructs mediate the relationship between demographic risk factors and the intention to misuse tramadol, ultimately contributing to higher rates of consumption among adolescents. This growing body of evidence not only establishes the direct association between socio-demographic contexts and substance abuse but also underscores the explanatory power of TPB in accounting for how these contextual influences are internalized and translated into behavioral outcomes. Integrating these perspectives highlights the need for targeted interventions that address not only the structural and familial risk factors but also the cognitive and normative dimensions that drive tramadol abuse among secondary school and university students in Africa.

2.2. Risk Factors That Contribute to Tramadol Abuse Among Students

The growing concern over tramadol misuse among school children demands a thorough understanding of the underlying risk factors. While the existing literature sheds light on several potential contributors, examining their strengths and weaknesses is crucial for designing effective prevention and intervention strategies. Studies like [8] highlight the significant role of peer pressure in driving tramadol misuse. The desire to fit in with drug-using peers can be a powerful motivator, especially during adolescence when social belonging is paramount. However, this study solely focuses on peer pressure risks overlooking broader social and cultural factors influencing adolescent behaviour. Research by [16] in Afghanistan, for instance, points to the context of conflict and limited opportunities fuelling substance use among teenagers. Examining how social norms and environments interact with peer pressure can create a more nuanced understanding of this risk factor. The [16] study further underscores the crucial role of tramadol's easy availability, often through informal networks or unregulated over-the-counter sale. This readily accessible supply removes significant barriers to obtaining the drug, particularly in resource-limited settings. However, focusing solely on availability may neglect the influence of marketing strategies and prescription practices that contribute to oversupply and misuse. Further research is needed to explore the complex interplay between availability, marketing, and regulatory frameworks.

A study by [5] point out the critical gap in knowledge about tramadol's dangers among students and that underestimating its addictive potential and risks can lead to casual experimentation and ultimately, dependence. However, simply providing information may not be sufficient. Research further suggests that tramadol misuse can be a coping mechanism for underlying mental health issues. Addressing knowledge gaps needs to be integrated with mental health awareness and support systems to effectively target this risk factor. A recent study by [8] highlight the link between pre-existing mental health conditions and family history of substance abuse with tramadol misuse. These vulnerabilities can increase susceptibility to seeking tramadol's temporary relief from anxiety, depression, or other emotional distress. However, these studies emphasize correlation, not causation. Further research is needed to explore the complex interplay between psychological factors, family dynamics, and social contexts in contributing to tramadol misuse. Understanding the various risk factors for tramadol use among students requires moving beyond a linear cause-and-effect model. While peer pressure, accessibility, knowledge gaps, and underlying vulnerabilities play a role, it is crucial to consider their interaction with socio-cultural factors, economic disparities, and mental health support systems. By adopting a multifaceted approach that acknowledges the strengths and weaknesses of existing research, we can develop more effective interventions and prevention strategies to safeguard the well-being of our youth who are the future leaders of our country.

2.3. Psychological and Social Effects of Tramadol Abuse on Student Users

Tramadol use has garnered public interest for its association with an elevated risk of anxiety disorders, depression, and psychosis among student users [5, 8]. These mental health conditions wield substantial influence over emotional well-being, social functioning, and academic performance, creating a multifaceted challenge for affected individuals. Cognitive functions, including memory, attention, and decision-making, bear the brunt of tramadol's impact. Such cognitive impairment manifests as difficulties in learning, concentrating in class, and completing schoolwork. However, it is vital to acknowledge methodological weaknesses in these studies, such as the potential for recall bias in self-reporting tramadol use, which might influence the accuracy of the

findings. Erratic mood changes, irritability, and aggression are identified as emotional consequences of tramadol use [16]. These emotional fluctuations disrupt interpersonal relationships with peers and teachers, thereby creating a challenging learning environment. The heightened risk of suicidal thoughts and behaviours, particularly among adolescents with pre-existing mental health vulnerabilities, accentuates the gravity of the psychological impact [5].

Tramadol misuse also disrupts neurotransmitter systems, leading to mood dysregulation and emotional challenges [8]. Severe cases may even trigger suicidal ideation and attempts, underscoring the severity of the mental health consequences. Cognitive impairment extends to memory, attention, and concentration, affecting academic performance and daily activities. However, the methodological limitation of small sample sizes in some studies may affect the generalizability of these findings. Moreover, sleep disturbances induced by tramadol, such as insomnia and nightmares, contribute to a vicious cycle of negative mental health consequences [8]. This interplay between tramadol's impact on sleep patterns and its repercussions on anxiety and depression calls for a nuanced understanding of the bidirectional relationships. Methodologically, the reliance on self-reported sleep patterns may introduce recall bias and affect the accuracy of results. In addition, tramadol's opioid properties raise concerns about dependence and addiction, particularly among vulnerable adolescents, leading to compulsive drug-seeking behaviours and financial difficulties [16]. Social isolation and stigma emerge as additional consequences, with students avoiding socializing due to fear of judgment [8]. The strain on relationships with family, friends, and peers, coupled with engaging in risky behaviors to sustain drug supply, illustrates the far-reaching social ramifications [5]. Yet, the potential for underreporting of stigmatized behaviours in self-reported surveys represents a methodological limitation.

Academic repercussions, such as poor grades, increased absenteeism, and difficulty completing schoolwork, result from tramadol's impact on cognitive function, sleep and students learning. Gender differences in susceptibility to certain psychological effects, particularly anxiety and depression, introduce complexity into the picture [8]. The co-occurrence of tramadol misuse with existing mental health conditions necessitates holistic treatment approaches. As research delves into the long-term consequences of tramadol misuse on adolescent brain development and mental health, the potential for lasting negative impacts becomes a focal point [5]. However, the evolving nature of this research necessitates ongoing scrutiny of methodological approaches to ensure the robustness and reliability of findings to inform innovative policies and practices to address this social conundrum.

3. Methodology

3.1. Research Design

This research employed a cross-sectional survey design to direct the study. A cross-sectional study is a design that gathers data for variables at the same time from a sample or population [32]. The rationale behind choosing this design was that it is relevant to the temporal requirements of the study in trying to successfully achieve a complete view of the phenomenon within a given timeframe. This design enables our researcher team to obtain a wide distribution of responses related to the current level of tramadol abuses, risk factors predisposing students to the abuses and how tramadol abuses affect the social and psychological well-being of the users.

3.2. Sampling

The population of the study comprised all Junior high school students in the Sagnarigu Municipality in the Northern Region of Ghana where this research was conducted. This was made up of 16,963 JHS students across the 16 circuits. In all, 4 circuits were selected among the 16 circuits using a simple random sampling procedure. A Simple Random Sampling (SRS) technique was also used to select 391 respondents to complete the questionnaire for the study. This was later zero down to 60 respondents who were equally randomly selected for further survey to provide an opportunity for in-depth investigation.

3.3. Measures and Instruments

A Self-structured questionnaire, which comprised ten [10] items was the main instrument used to collect the data for this study. The questionnaire was made up of two sections. Section one was to measure the demographic characteristics of respondents, which encompasses age, sex, level of education, and family background. Section two of the questionnaire was to measure the prevalence of tramadol abuse among JHS students, frequency and pattern of use, potential risk factors in tramadol abuse, including peer pressure, unavailability, and knowledge of the consequences. All the questionnaire items were closed-ended. The internal consistencies of the items in the questionnaire were computed using the Cronbach Alpha formula which yielded an alpha of α=.81 which was acceptable for the research. According to [11], Cronbach's alpha values can be interpreted as follows: $\alpha \geq 0.9$ = Excellent; $0.8 \leq \alpha < 0.9$ = Good; $0.7 \leq \alpha < 0.8$ = Acceptable; $0.6 \leq \alpha < 0.7$ = Questionable; $0.5 \leq \alpha < 0.6$ = Poor; and $\alpha < 0.5$ = Unacceptable**.** The questionnaires were administered to the respondents by the research team within a period of one month. Vida who is an MPhil candidate visited the sampled schools with undergraduate student who served as research assistant to administer the survey tools to the respondents. Dr. Bariham

who is the supervisor of the thesis designed the methodology, administer the research project, review and finalize the report while Dr. Edward supported Vida with data management, coding and entry into SPSS package for analysis. All in all, it took the team a whole year to complete this research project.

3.4. Ethical Consideration

The purpose of the study, procedures, possible harms, and benefits were explained to the respondents. Informed consent forms were given to respondents, indicating their agreement to participate voluntarily in the study. This described participants' rights, one of which was the right to withdraw from the study at any time without experiencing any consequences. Consents for the study were obtained from the respective authorities, such as local education authorities and school administration, before the participants took part in the study. All collected information was handled with utmost confidentiality. Personal identifiers were substituted with codes in a way that individual responses could not be traced back to individual participants. Data collected were only for the research team's access, and information provided to other stakeholders was kept at the aggregate level so as not to compromise anonymity. To guarantee the anonymity of participants, personal data were anonymized during reporting and data analysis. Using codes instead of names or other personal details guarantees the confidentiality of responses from respondents. The data collected was stored in a computer with a password. The hard copies of the data were also locked in a suitcase. These were to be discarded after five years.

4. Results

In this section, the results are presented according the questions and captured in tables for an easy understanding and interpretation. The quantitative data from the questionnaires were analyzed to test the correlation between the study constructs and how they affect psychosocial well-being of the users. Inferential statistics are used when the researcher wants to generalize the results to the population on the basis of the sample [25].

Research Question 1: To what extent do JHS students in the study area abuse tramadol substances?

Table 1 presents the distribution of responses on tramadol use among Junior High School students. Out of the 60 respondents, 43.3% (n = 26) reported having used tramadol, while 46.7% (n = 28) indicated that they had never used it.

Table 1. *Descriptive Analysis of Tramadol use Among Students.*

Have you ever used Tramadol?	Freq.	Percent	Cum.
Maybe	6	10.00	10.00
No	28	46.67	56.67
Yes	26	43.33	100.00
Total	60	100.00	

In Table 1, a smaller proportion, 10.0% (n = 6), expressed uncertainty (“maybe”) about their use of tramadol. Cumulatively, more than half of the respondents (56.7%) reported either no use or uncertainty, while a substantial proportion—almost two-fifths—affirmed usage of tramadol. These findings suggest that tramadol consumption is relatively prevalent within the sample, with usage rates approaching parity with non-usage. The presence of respondents who were unsure about their use also highlights potential issues of recall, awareness, or stigma associated with reporting substance use. Overall, the data underscore the significance of tramadol use as a public health concern among adolescents, warranting further investigation into underlying risk factors and behavioural patterns. These findings align with earlier research in Ghana by [26] whose research in Jirapa Municipality found a 36.2% prevalence of tramadol use with most users consuming the drug without medical supervision. Similarly, a recent research by [12] reported a 17.8% lifetime prevalence of tramadol use among university students in Tamale, with motivations linked to academic performance, stamina, and sexual enhancement. Together, these studies corroborate the present findings, underscoring tramadol misuse as a growing public health concern among Ghanaian adolescents and young adults.

Table 2. *Descriptive Analysis of Frequency of Tramadol use.*

How often do you use Tramadol?	Freq.	Percent	Cum.
Daily	1	1.67	1.67
Never	23	38.33	40.00
Often	8	13.33	53.33
Rarely	16	26.67	80.00
Sometimes	12	20.00	100.00
Total	60	100.00	

Table 2 presents the frequency of tramadol use among JHS students. The findings reveal that 38.3% (n = 23) of respondents reported never using tramadol, while 61.7% acknowledged varying levels of use. Among those who had used tramadol, 26.7% (n = 16) reported rare use, 20.0% (n = 12) indicated sometimes, 13.3% (n = 8) reported often, and a small proportion, 1.7% (n = 1), admitted to daily use. These figures suggest that while daily dependency may not be widespread, a majority of students have experimented with or continue to use tramadol to some extent, with nearly one-third (33.3%) reporting moderate to frequent use ("sometimes" and "often"). This indicates a significant public health concern, as even occasional or experimental use during adolescence can escalate into dependency and associated psychosocial risks.

These results align with findings from [17], who reported that approximately 9% of high school students in the Brong Ahafo Region had used tramadol or other opioids, largely influenced by peer pressure and accessibility. Although their prevalence rate was lower, the tendency towards experimentation and occasional use parallels the "rarely" and "sometimes" patterns observed in this study. Similarly, a more recent study in urban informal settlements of Asokore-Mampong found that tramadol abuse among youth aged 15–35 was often habitual, with respondents reporting repeated use for energy, endurance, and psychosocial relief [21]. This corresponds with the "sometimes" and "often" categories in the present findings, though the frequency of use was higher among older youth in informal contexts. Taken together, these results indicate that tramadol use among JHS students is not merely experimental but shows signs of recurring consumption. When viewed alongside the Brong Ahafo and Asokore-Mampong studies, the evidence underscores tramadol misuse as a growing behavioural and public health concern across age groups in Ghana. Preventive interventions are therefore essential, targeting both early experimentation in schools and sustained misuse in community contexts.

Research Question 2: What risk factors contribute to tramadol abuse among Junior High School students in the study area?

Logistic regression analysis was employed to examine the risk factors associated with tramadol use among Junior High School pupils as illustrated by Table 3. This analytical approach enabled the identification of key predictors influencing the probability of tramadol consumption within the study population, thereby providing a nuanced understanding of the determinants of use.

Table 3. *Logistic Regression Analysis of Predictors of Tramadol use Among Students.*

Tramadol use	Coef.	St. Err.	t-value	p-value	95% Conf	Interval]	Sig
Peer pressure	1.539	1.818	0.36	.715	.152	15.594	
Family history	.642	.493	-0.58	.564	.143	2.887	
Drug Availability	2.227	4.449	0.40	.689	.044	111.787	
Age	2.45	.622	3.53	0	1.49	4.029	***
Grade	.179	.131	-2.34	.019	.042	.756	**
Constant	0	0	-3.01	.003	0	.018	***
Mean dependent var	0.633		SD dependent var		0.663		
Pseudo r-squared	0.320		Number of obs		60		
Chi-square	26.561		Prob > chi2		0.000		

Tramadol use	Coef.	St. Err.	t-value	p-value	95% Conf	Interval]	Sig
Akaike crit. (AIC)	68.350		Bayesian crit. (BIC)		80.916		

*** p<.01, ** p<.05, * p<.1

The logistic regression analysis in Table 3 revealed that **age** and grade level were the only significant predictors of tramadol use among Junior High School students. Older students demonstrated a markedly higher likelihood of using tramadol (Coef. = 2.45, p <.01), underscoring age as a critical determinant of substance use in adolescence. Conversely, grade level showed an inverse association (Coef. =.179, p <.05), suggesting that students in higher grades were less likely to engage in tramadol use. Peer pressure, family history of substance use, and drug availability, although positively associated with tramadol consumption, were not statistically significant in this sample. The model explained approximately 32% of the variance, indicating a moderate explanatory power, while the overall significance (χ^2 = 26.561, p <.001) confirmed its robustness. These findings align with recent Ghanaian studies highlighting the influence of age and educational attainment on substance use. A study by [13] similarly reported higher odds of tramadol use among older university students, reinforcing the notion that advancing age elevates risk. Likewise, [24] identified socio-demographic factors such as living arrangements and unemployment as significant predictors of non-prescription tramadol use in urban informal settlements. The consistency across studies suggests that developmental and social transitions increase vulnerability to substance abuse. However, the lack of significance for peer pressure and availability in this study contrasts with broader evidence, likely reflecting sample size limitations or contextual differences in JHS populations. Together, these findings emphasize the need for age-sensitive and grade-tailored interventions to address tramadol misuse among Ghanaian adolescents.

Research Question 3: How does tramadol abuse affect the social and phycological well-being of junior high school students who abuses the tramadol?

The psychological and social effects of tramadol use among Junior High School (JHS) pupils are critical areas of concern, as they can significantly impact the overall well-being of these adolescents. The data presented in Table 4 highlights the relationship changes associated with the frequency of tramadol use.

Table 4. *Descriptive Analysis of Tramadol use Frequency and Breakdown of Interpersonal Relationship.*

Tramadol frequency	Relationship Change		
	No	Yes	Total
Daily	0	1	1
Never	15	8	23
Often	0	8	8
Rarely	1	15	16
Sometimes	1	11	12
Total	17	43	60

Pearson Chi2 = 25.17 Prob = 0.0000

Table 4 presents the association between the frequency of tramadol use and changes in interpersonal relationships among Junior High School students. Out of the 60 respondents, 43 (71.7%) reported changes in their interpersonal relationships attributable to tramadol use, while 17 (28.3%) reported no change. A chi-square test revealed a statistically significant association between tramadol use frequency and interpersonal relationship changes (χ^2 = 25.17, p <.001). Notably, students who used tramadol "often," "rarely," or "sometimes" were more likely to report relationship difficulties compared to non-users. For example, among those who reported "rare" use, 15 out of 16 students (93.8%) acknowledged relationship changes, while all "often" users (100%) indicated similar difficulties. By contrast, only 8 out of 23 non-users (34.8%) reported interpersonal relationship problems. These findings underscore the detrimental social con-

sequences of tramadol misuse, suggesting that frequency of use is a strong predictor of relationship disruptions among adolescents. These findings are consistent with international evidence linking tramadol misuse to social and relational problems. In a Nigerian study, [19, 31] found that high levels of tramadol abuse among young people were associated with strained family ties, peer conflicts, and reduced academic engagement, mirroring the interpersonal disruptions identified in this study. Similarly, [1], in an Egyptian context, found that tramadol misuse was significantly correlated with poor social adjustment, including relationship breakdowns and increased reports of marital and peer conflict. Together, these studies corroborate the present findings by demonstrating that tramadol misuse has far-reaching consequences beyond individual health, extending into the social and relational domains of users' lives. The convergence of results across different national contexts highlights tramadol abuse as a global public health concern that adversely affects adolescent psychosocial development. This finding indicates the need for further research to explore the nuances of how tramadol uses impacts mood, potentially mediated by factors such as the frequency of use or the context in which it is consumed. Table 5 present the results on relationship between tramadol use and mood changes among the consumers.

Table 5. *Chi-square Analysis of Tramadol Use and Mood Change.*

Tramadol use	Mood Change					
	No severity	Mild severity	Moderate severity	Severe	Very severe	Total
Maybe	3	2	0	1	0	6
No	19	5	3	0	1	28
Yes	16	1	1	4	4	26
Total	38	8	4	5	5	60
Pearson Chi2 = 12.85 Prob = 0.1170						

The chi-square test in Table 5 examining the association between tramadol use and self-reported mood change yielded a Pearson χ^2(?, N = 60) = 12.85, p = 0.117, indicating no statistically significant association at conventional levels. However, examination of the proportions suggests a notable trend: among respondents who reported tramadol use (n = 26), eight (30.8%) reported **severe or very severe** mood changes, compared to only one (3.6%) among non-users. Conversely, non-users were more likely to report **no severity or mild severity** of mood change (85.8%) than users. Although this association did not reach statistical significance, likely due to the relatively small sample size, the descriptive patterns highlight a potentially meaningful relationship between tramadol use and heightened mood disturbance that warrants further investigation with larger samples. These findings are consistent with emerging Ghanaian literature linking tramadol use to adverse psychosocial and mental health outcomes. For example, [12] found that tramadol use among university students was not only prevalent but also associated with negative cognitive and behavioral consequences that could exacerbate mood-related problems. Similarly, [23], in a study of youth in urban informal settlements, reported that tramadol use was common among socially vulnerable groups and was often linked to psychosocial stressors, including depression and anxiety. These studies support the interpretation that even if statistical significance was not achieved in the current dataset, the observed pattern aligns with broader evidence suggesting tramadol use is associated with increased risk of mood disturbance and other psychosocial harms in Ghanaian youth.

Table 6. *Chi-square Analysis of Tramadol Use and Anxiety Levels.*

Tramadol use	Anxiety Levels					
	No severity	Mild severity	Moderate severity	Severe	Very severe	Total
Maybe	2	2	0	2	0	6
No	14	6	3	1	4	28

Tramadol use	Anxiety Levels					
	No severity	Mild severity	Moderate severity	Severe	Very severe	Total
Yes	11	0	3	9	3	26
Total	27	8	6	12	7	60

Pearson Chi2 = 15.65 Prob = 0.0476

The chi-square analysis in Table 6 examined the relationship between tramadol use and self-reported anxiety levels. The results indicated a statistically significant association, $\chi^2(?, N = 60) = 15.65$, $p = 0.0476$. Specifically, students who reported tramadol use were disproportionately more likely to experience severe or very severe anxiety (12 of 26; 46.2%) compared to non-users (5 of 28; 17.9%). Conversely, non-users were more likely to report no severity or only mild severity of anxiety (20 of 28; 71.4%) compared to users (11 of 26; 42.3%). These findings suggest that tramadol use is significantly linked with heightened anxiety levels among JHS students. Comparable trends have been observed in the United States. For instance, [6] reported that adolescents misusing prescription opioids, including tramadol, exhibited significantly higher rates of anxiety disorders and related mental health challenges compared to non-users. Similarly, [30], in a nationally representative study, found that prescription opioid misuse was strongly correlated with generalized anxiety disorder and other affective symptoms among U.S. youth and young adults. Both studies align with the present findings by reinforcing the association between tramadol use and increased risk of anxiety, suggesting that opioid misuse contributes to broader psychosocial and emotional vulnerabilities across different sociocultural contexts.

Multivariate Analysis of Variance (MANOVA) Results

Table 7 presents the Wilks' lambda, Pillai's trace, Lawley-Hotelling trace, and Roy's largest root statistics, along with their respective p-values, to assess the effect of tramadol use on the aforementioned variables.

Table 7. *Multivariate Analysis of Variance of Behaviour change, Mood change, Relationship change and Anxiety Levels of Tramadol users.*

Number of obs = 60

W = Wilks' lambda L = Lawley-Hotelling trace

P = Pillai's trace R = Roy's largest root

Source | Statistic df F(df1, df2) = F Prob>F

Tramadol use | W 0.3855 2 8.0 108.0 8.24 0.0000 e

| P 0.6208 8.0 110.0 6.19 0.0000 a

| L 1.5780 8.0 106.0 10.45 0.0000 a

| R 1.5676 4.0 55.0 21.55 0.0000 u

Residual | 57

Total | 59

e = exact, a = approximate, u = upper bound on F

The multivariate analysis of variance (MANOVA) presented in Table 7 examined the combined effects of tramadol use on behavioural change, mood change, relationship change, and anxiety levels among students. The results across all four test statistics—Wilks' lambda (W = 0.3855, $F(8, 108) = 8.24$, $p < 0.001$), Pillai's trace (P = 0.6208, $F(8, 110) = 6.19$, $p < 0.001$), Lawley-Hotelling trace (L = 1.5780, $F(8, 106) = 10.45$, $p < 0.001$), and Roy's largest root (R = 1.5676, $F(4, 55) = 21.55$, $p < 0.001$)—all indicated a statistically significant multivariate effect. This demonstrates that tramadol use significantly influences multiple psychosocial outcomes simultaneously, including behaviour, mood, interpersonal relationships, and anxiety. The findings suggest that tramadol consumption exerts a broad and adverse impact on students' psychological and social functioning. Comparable evidence has been reported in recent European studies. For example,

[18], in a multi-country survey across Europe, highlighted that non-medical tramadol use among young people was significantly associated with psychosocial difficulties, including elevated levels of anxiety, mood swings, and impaired interpersonal relationships. Similarly, [20], in a study of Nordic adolescents, found that tramadol misuse correlated with behavioural dysregulation, depressive symptoms, and strained peer and family relationships. These findings corroborate the current study's results by underscoring that tramadol misuse has multidimensional effects on both psychological wellbeing and social functioning, with similar patterns observed across different sociocultural settings.

Discussion of Results

The findings that age significantly predicts tramadol use while grade shows a negative association can be understood through the lens of the Theory of Planned Behavior (TPB). According to TPB, adolescents' intentions and behaviors are shaped by their attitudes**,** subjective norms**,** and perceived behavioral control [3]. As students grow older, their exposure to diverse social environments, peer networks, and psychosocial stressors increases, which may shape more permissive attitudes toward substance use and reduce perceived risks. Conversely, grade level, which reflects academic progression, may offer a protective influence by fostering stronger institutional regulation, exposure to preventive education, and commitment to academic goals. Thus, while chronological age enhances exposure and risk, grade attainment appears to buffer against tramadol misuse by embedding students in more structured educational and social contexts. In comparison with existing research, these results align with Ghanaian and African evidence showing that substance use prevalence rises with age. For instance, the findings from [12] research reported higher odds of tramadol use among older university students, while [24] found that socio-demographic transitions such as unemployment and independent living increased non-prescription tramadol use among youth in urban settlements. Similarly, [27] documented a 36.2% prevalence of tramadol use among older adolescents in the Jirapa Municipality. However, the negative effect of grade found in the present study is somewhat unique, diverging from earlier work that emphasized peer pressure and accessibility as stronger predictors [18]. This distinction suggests that while age-related vulnerability is consistent, the protective role of higher grades may reflect the contextual influence of Ghana's junior high school system, where progression is tied to discipline and exam preparation. The uniqueness of the age/grade prediction effect in this study lies in its nuanced differentiation of chronological and academic development. Unlike most predictors, age reflects exposure to external influences, while grade indicates structured academic engagement. This dual finding implies that interventions must not only focus on delaying onset of substance use as students grow older but also strengthen the protective academic environments that higher grades provide. In other words, students who remain in lower grades at older ages may be doubly vulnerable—facing both age-related risk and reduced grade-related protection. This resonates with international findings that school engagement acts as a protective factor against adolescent drug use [6, 21]. Therefore, policy interventions should integrate age-sensitive health education with school-based retention and progression strategies, ensuring that vulnerable adolescents are supported both socially and academically to mitigate the risk of tramadol abuse.

5. Conclusions

The findings from this study underscore the growing concern of tramadol misuse among JHS students in the study area, with both prevalence and psychosocial consequences emerging as significant issues. Descriptive analysis (Table 1) revealed that nearly half of the respondents reported ever using tramadol, indicating an alarmingly high level of exposure among adolescents. Further, frequency analysis (Table 2) showed that although most students reported non-regular use, a substantial proportion admitted to occasional or frequent use, highlighting the potential for experimentation to escalate into habitual consumption. The logistic regression analysis (Table 3) identified age and academic grade as significant predictors of tramadol use, suggesting that as students advance in school and grow older, they become more susceptible to substance misuse. Peer pressure, family history, and drug availability, although not statistically significant, still showed directional influence, aligning with broader risk factor frameworks. The chi-square analysis (Tables 4 and 5) demonstrated significant associations between tramadol use and interpersonal relationship breakdowns as well as mood changes, though the latter did not reach conventional levels of statistical significance. Importantly, tramadol use was found to be significantly linked to higher levels of anxiety (Table 6), further illustrating its psychological toll on young users. Taken together, these findings reveal that tramadol misuse among students is not only widespread but also closely tied to psychosocial disruptions, including strained relationships, mood disturbances, and elevated anxiety levels. This mirrors patterns observed in both Ghanaian and international studies, reinforcing that tramadol abuse is a multifaceted social and public health problem. The evidence calls for urgent, targeted interventions that combine school-based education, peer and family support systems, and stricter regulation of drug access to mitigate the risks and safeguard the wellbeing of young people.

Finally, the finding that peer pressure and drug accessibility did not reach statistical significance in predicting tramadol abuse among JHS students should be interpreted cautiously and limited to only the study area. One possible explanation is related to methodological constraints such as **i**nsufficient sample size**,** which may have reduced the statistical power to detect meaningful associations, leading to a potential Type II error [25]. In addition, regional particularities may play a role: in communities where tramadol use is already normalized or access to the substance is relatively uniform, peer influence

and accessibility may not emerge as distinguishing predictors. Measurement limitations may also contribute, as reliance on single-item or dichotomous indicators for peer pressure and accessibility can underestimate their nuanced effects compared to multi-item scales [29]. Finally, the dominance of other predictors such as family drug use, parental supervision, or psychosocial stressors may overshadow the explanatory power of peer influence and accessibility. These considerations suggest that the non-significant results do not necessarily negate the role of peer and contextual factors but rather highlight the complexity of adolescent substance use behaviors within specific sociocultural environments.

6. Recommendations

Based on the findings, several policy measures are critical for addressing tramadol misuse among students in Ghana.

First, school-based prevention programs should be prioritized, incorporating drug education into the curriculum to raise awareness about the risks of tramadol and other substance misuse. Such programs must move beyond awareness creation to include skill-building in resisting peer pressure and fostering positive coping mechanisms for stress and academic demands.

Second, family-centered interventions are essential. Parents and guardians should be equipped with knowledge and skills to monitor their children's behaviour, communicate effectively about drug risks, and create supportive home environments that discourage substance use. Community-level sensitization campaigns can complement this effort, targeting both parents and adolescents to break the culture of silence surrounding tramadol use.

Third, strengthening drug regulation and enforcement remains a crucial policy priority. The accessibility of tramadol without prescription, as revealed in this and other studies, reflects regulatory lapses. The Food and Drugs Authority (FDA), together with law enforcement agencies, must intensify efforts to restrict illegal supply chains, clamp down on unlicensed vendors, and regulate the sale of prescription opioids more effectively.

Finally, psychosocial support services should be expanded to address the mental health consequences of tramadol misuse. School counseling units should be resourced to provide early detection, referral, and support for students struggling with drug-related challenges, while community health centers should integrate substance abuse counseling into their services. A multisectoral approach involving schools, families, health agencies, and policymakers is essential to reverse current trends and safeguard the wellbeing of Ghana's future leaders.

Abbreviations

BMI	Body Mass Index
FDA	Food and Drugs Authority
JHS	Junior High School
MANOVA	Multivariate Analysis of Variance
SRS	Simple Random Sampling
SQ	Structured Questionnaire
TPB	Theory of Planned Behavior

Author Contributions

Iddrisu Bariham: Designed the Methodology, Project administration, Resources mobilization, Supervision, Visualization, Writing – review, proofreading & editing

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Conflicts of Interest

The authors declare no conflicts of interest.

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