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Marijuana Use among In-School Adolescents in Saint Vincent and the Grenadines: A Reciprocal Determinism Perspective

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Abstract

Substance use, particularly marijuana among adolescents, remains a public health concern, especially in the Island countries in the Caribbean. There is a paucity of research using current data on the prevalence and potential correlates of marijuana use among in-school adolescents in Saint Vincent and the Grenadines. This study, therefore, aimed at assessing the prevalence and correlates of marijuana use among adolescents in St Vincent and the Grenadines. We analysed data from the 2018 Global School-Based Student Health Survey among in-school adolescents in Saint Vincent and the Grenadines. We conducted descriptive statistics, Chi-square analysis, and binary logistic regression to determine the prevalence of marijuana use and associated factors. The prevalence of marijuana among adolescents in Saint Vincent and the Grenadines was 17.1 %. The odds of marijuana use were higher in males (AOR = 1.36, 95%CI = 1.002-1.851); adolescents engaged in multiple-partner (AOR = 2.94, 95%CI = 2.177-3.959); adolescents who reported using amphetamine or methamphetamine (AOR = 6.60, 95%CI = 4.269-10.201). Similarly, the odds of reporting marijuana use were higher in those who reported using alcohol (AOR = 3.27, 95 %CI = 2.396-4.463); adolescents whose parents used tobacco (AOR=1.44, 95%CI=1.017-2.044) and those with suicidal ideation (AOR = 1.47, 95%CI = 1.060-2.34). Meanwhile, the odds of marijuana usage were lower among adolescents who were bullied (AOR = 0.67, 95%CI = 0.465-0.950) and adolescents whose parents knew what they did during their leisure (AOR = 0.60, 95%CI = 0.438- 0.832). Various factors relating to behavioural, social, alcohol and substance use, aggression and self-harm, including parental factors, predict marijuana usage. Multiple factors should be considered when designing interventions to target marijuana usage.

Keywords: Global School-Based Student Health Survey, In-School Adolescents, Marijuana Use, Saint Vincent and the Grenadines, Substance Use.

1. Introduction

Adolescence is a time of rapid growth, curiosity and increasing independence. For in-school adolescents, this stage is critical, as they begin to form habits and attitudes that may influence their

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health and well-being. Among the many risks they may encounter, marijuana use has become a significant public health concern globally, due to its effects on cognitive development, mental health, academic performance, and social well-being, and vulnerability to psychological disorders (Jacobus, Tapert, 2014; Lorenzetti et al., 2020). The adolescent brain is still developing; hence, the use of marijuana makes it vulnerable.

According to the Global School-Based Student Health Survey (GSHS), approximately 7.02 % of school-going adolescents aged 12-15 years reported cannabis use, with boys (9.20 %) more likely than girls (4.20 %) to have used cannabis (Son et al.,2023). In the Caribbean, regional prevalence varies. For instance, the 2017 GSHS in Jamaica reported that 14.0 % of school-going adolescents aged 12–17 used marijuana in the past 30 days (Dadras, 2024). A multi-country survey conducted between 2011 and 2013 across Caribbean and South American nations, including Trinidad and Tobago and The Bahamas, found an average marijuana use prevalence of 8.3 % among secondary school students (Peltzer, Pengpid, 2018). Additionally, data from Trinidad and Tobago revealed that 12.1 % of students had used marijuana in their lifetime, 6.4 % in the past year, and 2.7 % in the past 30 days (Organization..., 2010; Inter-American Drug Abuse Control Commission, 2010). However, in Saint Vincent and the Grenadines (SVG), nationally representative data on adolescent marijuana use remain limited. Some existing studies have explored some substance use patterns and related behaviours. For instance, Myers et al. (2021) reported how the illicit drug economy contributes to HIV risk. Peltzer and Pengpid (2022) also documented alcohol misuse and behaviour correlates among school- going adolescents, while Sarfo et al. (2022, 2023) examined suicidal behaviours and injury risk indicators often linked to substance use. These findings reveal the need to focus on the prevalence of marijuana use among in-school adolescents in SVG.

Marijuana use in adolescents has been linked to a range of factors. These include demographic factors such as age, sex and grade, with older male students often reporting higher rates (Goncy, Mrug, 2013; Howard, Ali, 2014). Other factors include peer pressure, poor parental supervision, truancy, bullying, emotional distress, and family drug use (Elsaesser et al., 2020; Martin et al., 2020; Sarfo et al., 2022). In SVG, there is a unique context for understanding adolescent marijuana use due to its evolving legal stance on cannabis and long-standing cultural associations. The country's partial decriminalisation of marijuana for religious use and private consumption may influence adolescent perceptions of harm and accessibility (Cottle, 2023). Additionally, gender norms and community attitudes shape behaviours and reinforce risk-taking, particularly among male youth (Bishop et al., 2022).

This study uses Bandura's Social Learning Theory (1977) to explain how adolescents may pick up marijuana use by observing others around them, whether it is their peers, family, or members of the wider community. The theory's concept of Reciprocal Determinism, which describes the dynamic interaction among personal factors, environmental influences, and behaviour, helps us understand how these elements interact. Given the limited data available in SVG, this study aims to assess how common marijuana use is among in-school adolescents and identify the main factors associated with it. The findings are expected to inform the development of targeted, evidence-based interventions and to contribute to broader global goals, such as the Sustainable Development Goals (SDG 3: Good Health and Well-being and SDG 4: Quality Education).

Conceptual framework

For an individual to understand the prevalence and contributing factors of marijuana use among in-school adolescents in a jurisdiction like SVG. There will be a need to develop effective preventive and intervention strategies to better understand the phenomenon. Adolescents' susceptibility to marijuana usage may be explained by a diversity of variables, which can be used as a framework to recognise the prevalence and correlation of marijuana use. Bandura (1977) propounded the Social Learning Theory, which unveiled Reciprocal Determinism, a framework also used to analyse predictors of marijuana use. The variables stated in the framework were categorised into personal, environmental, and behavioural factors. Personal and environmental factors were the explanatory variables, whilst behaviour was the outcome variable. With the personal factors (sex, age, grade, loneliness, multiple sexual partners, amphetamines or methamphetamines use, alcohol use, smoked cigarettes, serious injury, suicidal ideation), for instance, males, the use of amphetamines and suicidal ideation were noted to result from higher use of marijuana (Dadras, 2023). Also, with the environmental factors (truancy, physical fight,

bullying on campus, parents/guardians use tobacco and parents or guardians' knowledge of children's free time activities). A longitudinal study showed that when parents build an attachment with their children, they can protect their adolescents from the risk of violence exposure and substance use, including marijuana (Elsaesser et al., 2020). Studies around behaviour (use of marijuana) found that increased substance use and risky behaviour of adolescents may lead to future crises of adolescents (Manwani et al., 2022; Whitaker et al., 2021). Therefore, understanding the occurrence of marijuana usage among adolescents in SVG who are enrolled in school rests upon the connections and effects between these factors.

2. Materials and Methods

Study design and sample

Data for this study came from the 2018 GSHS in SVG, focusing on physical bullying among adolescents aged 13-17. The World Health Organization (WHO), alongside the CDC and the Ministry of Health, Wellness and Environment in SVG, conducted the GSHS, which uses a self-administered questionnaire to examine health-related behaviours in young people. This cross-sectional study used closed-ended questions to collect information from participants.

Sampling procedure

A two-stage cluster sampling method was used. First, schools were selected based on enrolment size. Then, classes were randomly chosen, with all students in selected classes participating. The study achieved a 100 % school response rate and a 78 % student response rate, with 1,876 students completing the survey.

Measures

Dependent variables

The study examined current marijuana use using a self-report question which examined present use in the past 30 days. Responses were binary, recorded as "yes" (1) or "no" (2).

Independent variables

The analysis used 21 predictor variables, including demographics, substance use, violence, personal and social factors, and suicidal behaviours. These variables are outlined in Table 1, along with their coding details.

Ethical statements

Ethics approvals were obtained from the relevant authorities, and tools were pretested for reliability and validity. Informed consent was obtained from students and their parents. The data is available on the WHO website for further review.

Statistical analysis

We applied sample weights to adjust for nonresponses and ensure representativeness. Missing data (ranging from 1 % to 10 %) were handled using multiple imputations. A bivariate analysis using Pearson's Chi-square identified significant relationships, which were then analysed using logistic regression. The adjusted odds ratios (AORs) were reported with 95 % confidence intervals (CIs).

3. Results

Prevalence of marijuana use among adolescents in SVG

The overall point prevalence of marijuana use was 17.1 %. (see Figure 1).

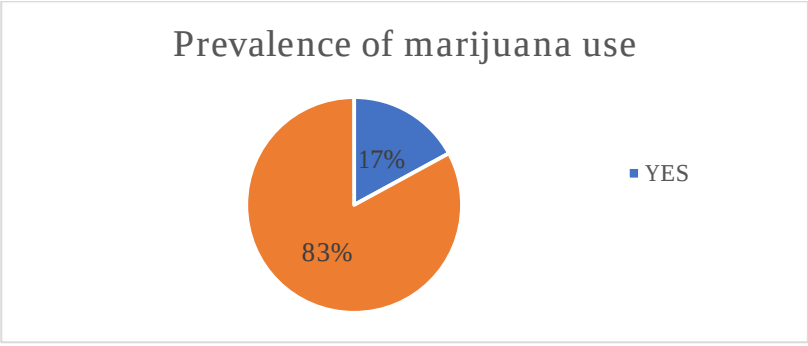

Fig. 1. Prevalence of marijuana use among in-school adolescents in SVG

Bivariate Analysis

Table 1 shows the summary of the bivariate analysis of factors associated with marijuana usage among adolescents in St Vincent and the Grenadines. The results showed that sex ($p < 0.001$), age ($p < 0.001$), missing school without permission ($p < 0.001$), feeling lonely ($p < 0.01$), and being in multiple sexual partnerships ($p < 0.001$) were significantly associated with marijuana usage. Additionally, use of amphetamines or methamphetamines ($p < 0.001$), drinking alcohol ($p < 0.001$), smoking cigarettes ($p < 0.001$) and engaging in a fight ($p < 0.001$) were also significantly associated with marijuana usage. Furthermore, parental tobacco use ($p < 0.001$) and parental supervision ($p < 0.001$) were significantly associated with marijuana usage.

Table 1. Bivariate analysis of personal and environmental factors and reported Marijuana use use among in-school adolescents in SVG

Variables	Category	Marijuana Use		χ^2	Phi Coefficient
		Yes n (%)	No n (%)		
Demographic					
Sex	Male	193 (21.8)	691 (78.2)	26.942***	0.120
	Female	127 (12.8)	865 (87.2)		
Age (years)	≤15	142 (13.7)	896 (86.3)	18.735***	-0.100
	≥16	178 (21.2)	660 (78.8)		
Grade	1–3	199 (16.3)	1021 (83.7)	1.373	-0.027
	4–5	121 (18.4)	535 (81.6)		
Behavioural and Social					
Missed classes without permission	Yes	150 (26.8)	409 (73.2)	53.789***	0.169
	No	170 (12.9)	1147 (87.1)		
Felt lonely most of the time	Yes	92 (21.8)	330 (78.2)	8.659**	0.068
	No	228 (15.7)	1226 (84.3)		
Had sexual intercourse with ≥2 persons	Yes	199 (30.9)	445 (69.1)	132.824***	0.266
	No	121 (9.8)	1111 (90.2)		
Drug and Substance Use					
Used amphetamines or methamphetamines	Yes	78 (59.5)	53 (40.5)	179.669***	0.309
	No	242 (13.9)	1503 (86.1)		
Currently drank alcohol	Yes	245 (27.9)	633 (72.1)	137.247***	0.270
	No	75 (7.5)	923 (92.5)		
Currently smoked cigarettes	Yes	75 (47.5)	83 (52.5)	112.779***	0.245
	No	245 (14.3)	1473 (85.7)		
Aggression and Self-Harm					
Involved in a physical fight	Yes	154 (25.5)	450 (74.5)	44.842***	0.155
	No	166 (13.1)	1106 (86.9)		
Bullied on school property	Yes	68 (15.2)	380 (84.8)	1.469	-0.028
	No	252 (17.6)	1176 (82.4)		
Seriously injured	Yes	206 (21.8)	741 (78.2)	29.799***	0.126
	No	114 (12.3)	815 (87.7)		
Seriously considered suicide	Yes	118 (22.7)	401 (77.3)	16.353***	0.093
	No	202 (14.9)	1155 (85.1)		
Parental Factors					
Parents/guardians used tobacco	Yes	80 (27.4)	212 (72.6)	26.133***	0.118
	No	240 (15.2)	1344 (84.8)		
Parents knew what they did during free time	Yes	73 (10.6)	616 (89.4)	32.145***	-0.131
	No	247 (20.8)	940 (79.2)		

Notes:
Percentages are row percentages.
χ^2 = Pearson Chi-square statistic.
$p < .05$, ** $p < .01$, *** $p < .001$.

Multivariate analysis of factors associated with marijuana usage among school-going adolescents in SVG

Table 2 presents the results of the logistic regression for predictors of marijuana use. After adjusting for other factors predicting multiple sexual partners, sex was the only demographic factor that predicted marijuana usage. Males had higher odds of being in a multiple-partner relationship than their female counterparts (AOR = 1.36, 95%CI = 1.002-1.851). Under behavioural and social factors, adolescents engaged in multiple-partner relationships had increased odds of reporting marijuana usage compared to their counterparts who did not report engaging in multiple sexual partnerships (AOR = 2.94, 95%CI = 2.177-3.959).

Among the drug and substance use factors, adolescents who reported using amphetamine or methamphetamine had higher odds of marijuana usage than those who reported not using those substances (AOR = 6.60, 95%CI = 4.269-10.201). Similarly, the odds of reporting marijuana use were higher in those who reported using alcohol than those who reported not currently drinking alcohol (AOR = 3.27, 95%CI = 2.396-4.463). Regarding factors relating to aggression and physical harm, adolescents who were bullied had lower odds of reporting marijuana usage compared to those who were not bullied (AOR = 0.67, 95%CI = 0.465-0.950). Meanwhile, higher odds of marijuana usage were reported among those with suicidal ideation compared to those without suicidal ideation who were bullied (AOR = 1.47, 95%CI = 1.060-2.034). Similarly, under the parental category adolescents whose parents used tobacco had higher odds of using marijuana compared to those whose parents did not use tobacco (AOR = 1.44, 95%CI = 1.017-2.044) while the odds of marijuana usage were lower among adolescents whose parents knew what they do during their leisure compared to adolescents whose parents who exercised less supervision (AOR = 0.60 95%CI = 0.438-0.832).

Table 2. Associated factors of marijuana use among in-school adolescents in SVG

Variables	**AOR**	**95 % CI for EXP(B)**	
		Lower	**Upper**
Demographic			
Sex (Ref: Female)	1.362*	1.002	1.851
Age (Ref: ≥16 years)	.978	.693	1.379
Grade (Ref: 4–5)	.954	.670	1.357
Behavioural and Social			
Missed classes without permission (Ref: No)	1.328	.991	1.780
Felt lonely most of the time (Ref: No)	1.292	.928	1.797
Had sexual intercourse with ≥2 persons (Ref: No)	2.936***	2.177	3.959
Drug and Substance Use			
Used amphetamines or methamphetamines (Ref: No)	6.599***	4.269	10.201
Currently drank alcohol (Ref: No)	3.270***	2.396	4.463
Currently smoked cigarettes (Ref: No)	2.877***	1.909	4.336
Aggression and Self-Harm			
Involved in a physical fight (Ref: No)	1.312	.972	1.769
Bullied on school property (Ref: No)	.665*	.465	.950
Seriously injured (Ref: No)	1.143	.850	1.537
Seriously considered suicide (Ref: No)	1.469*	1.060	2.034
Parental			
Parents/guardians used tobacco (Ref: No)	1.442*	1.017	2.044
Parents knew what they did during free time (Ref: No)	.604*	.438	.832

Notes: Hosmer and Lemeshow test (goodness-of-fit), χ^2 (8) = 7.453, p = 0.489.
* p < 0.05, ** p < 0.01, *** p < 0.001.

4. Discussion

The study investigated marijuana use among in-school adolescents in SVG, guided by Reciprocal Determinism. Reciprocal Determinism, in this context, posits that marijuana use behaviour among in-school adolescents results from continuous interactions among personal factors, environmental influences, and the behaviour itself (Tataw, 2024; Woodward, Macmillan, 2021).

The overall point prevalence of marijuana use among adolescents in SVG in this study was 17.1 %, suggesting that nearly one in six students reported current use. This prevalence appears higher than that reported in several global and regional estimates. For example, the GSHS reported that about 7.02 % of school-going adolescents aged 12–15 years used cannabis, with boys (9.20 %) more likely than girls (4.20 %) to report use (Son et al., 2023). In the Caribbean, a 14.0 % prevalence was reported among adolescents aged 12–17 years in Jamaica (Dadras, 2024), while a multi-country survey across Caribbean and South American countries found an average prevalence of 8.3 % among secondary school students (Peltzer, Pengpid, 2018).

The findings of this study also show a clear sex difference, with male adolescents (21.8 %) reporting higher marijuana use than females (12.8 %), which is consistent with previous studies showing that boys tend to report higher cannabis use than girls (Son et al., 2023). However, nationally representative data on adolescent marijuana use in SVG remain limited, as previous research in the country has mostly focused on related issues such as substance use behaviours, mental health, and risk behaviours (Myers et al., 2021; Peltzer, Pengpid, 2022; Sarfo et al., 2022, 2023). These findings, therefore, highlight the need for continued monitoring and prevention efforts targeting adolescent marijuana use in the country with a focus on selected personal and environmental factors.

Personal factors

Personal factors play a significant role in influencing adolescent marijuana use. These factors encompass intrinsic characteristics and psychological states that predispose individuals to engage in risky behaviours. One notable personal factor identified in this study is gender, where adolescent males were found to have a higher likelihood of using marijuana compared to their female counterparts. This finding aligns with research conducted by Dadras (2024), which also identified a positive association between adolescent males and marijuana use. The societal association of masculinity with risk-taking behaviours, coupled with gendered differences in social influences, may contribute to this disparity (Friedl et al., 2020; Greaves, Hemsing, 2020).

Additionally, sexual behaviour emerged as a significant personal factor. Adolescents who had engaged in sexual intercourse with two or more persons exhibited a higher likelihood of marijuana use. This behaviour may reflect an overarching propensity for risk-taking among adolescents, which aligns with previous findings (Manwani et al., 2022; Sullivan, 2020). Also, mental health status, particularly suicidal ideation, was another critical factor. Adolescents who seriously considered attempting suicide were more likely to use marijuana. Marijuana use in this context may act as a coping mechanism for managing emotional pain or psychological distress, as supported by prior research (Airagnes et al., 2023; Lehmann et al., 2024).

Environmental influences

Environmental influences are external conditions and interactions that shape adolescent behaviour, including family dynamics, peer interactions, and school experiences. Parental behaviours and monitoring emerged as significant environmental factors in this study. Adolescents whose parents or guardians used tobacco were more likely to use marijuana, likely due to a modelling effect where adolescents imitate the substance use behaviours they observe in their parents (English, Whitehill, 2023). Conversely, adolescents whose parents or guardians actively monitored their free-time activities were less likely to use marijuana. This finding underscores the protective role of parental engagement in deterring risky behaviours (Champion et al., 2022; Elsaesser et al., 2020; Mirzaei et al., 2024).

Social interactions at school also influenced marijuana use. Interestingly, adolescents who were bullied on school property were less likely to use it. This finding suggests that social isolation and restricted networks may reduce exposure to peer groups that promote marijuana use. Additionally, these adolescents may consciously avoid substance use to minimise further negative consequences in their lives. However, this result contradicts previous research that identified a positive relationship between bullying and marijuana use (Gao, Han, 2024; Lehmann, Wingert, Jones, 2024).

Behaviour

Marijuana use, the behaviour under study, is both a result of and a contributing factor to other risky behaviours, forming a cycle that perpetuates substance use. This study found strong associations between marijuana use and the use of other substances. Adolescents who used amphetamines or methamphetamines were significantly more likely to use marijuana. Similarly, those who consumed alcohol or smoked cigarettes had higher odds of marijuana use. These findings align with studies that indicate substance use behaviours often cluster together in adolescent populations (Halladay et al 2020; Whitaker et al., 2021; Manwani et al., 2022).

In some cases, marijuana use may serve as a coping mechanism for adolescents facing emotional challenges. For example, adolescents who seriously considered suicide might turn to marijuana as a temporary escape or means to manage psychological distress. This behaviour, while providing short-term relief, often exacerbates underlying issues, creating a feedback loop that reinforces the behaviour.

4. Conclusion

This study provides a comprehensive analysis of marijuana use among in-school adolescents in SVG, revealing significant demographic, behavioural, and social correlates. The associations between substance use and a range of demographic, behavioural, and psychosocial factors point to the need for holistic, multi-layered prevention strategies. Rather than focusing solely on individual behaviours, effective interventions should address the broader social and emotional contexts in which substance use occurs, particularly through gender-responsive programming and support systems that recognise co-occurring risk behaviours and mental health challenges. Furthermore, the protective role of parental involvement emphasises the value of engaging families in prevention efforts. Moving forward, policies and programs that incorporate family-based, school-centred, and community-informed approaches may be more successful in curbing adolescent marijuana use. Future research should explore these strategies longitudinally and qualitatively to deepen our understanding of how to support youth resilience.

5. Strengths and Limitations

The availability of school-based data was accessed on student health and behaviour to examine the prevalence and correlates of marijuana use among in-school adolescents in St. Vincent and Grenadines, which helped to leverage and better understand the scope of the issue. The study's findings can also be used to compare other Caribbean nations, identify regional trends, and inform cross-cultural comparisons. Similarly, the study findings can help identify potential risks and protective factors guiding prevention efforts and also provide crucial data on the extent of marijuana use among in-school adolescents by informing educational and public health policies and interventions.

Notwithstanding, while this theory provides valuable frameworks, it may not fully explain the complex nature of marijuana use among adolescents. Cultural and contextual factors specific to SVG were not considered; thus, marijuana use may be influenced by complex cultural, social, and economic factors that may require a deeper understanding of the local context. The study also lacks a longitudinal investigation to examine the development of marijuana use over time. The study's findings were not representative of the entire adolescent population in SVG because it excluded out-of-school adolescents. Although there are setbacks, the study's results are a foundation for future studies and educational sensitisation for in-school adolescents on the use of marijuana.

6. Implications for Practice, Policy and Research

Practice Implications

Both teachers and school staff should be trained to recognise signs of marijuana use, how to effectively intervene and refer students to appropriate support services. There should be implementation of early intervention and school-based prevention for students struggling with marijuana use (Benningfield, et al., 2015), including counselling, support groups, and referrals to rehabilitation services. Schools should engage both parents and families in drug education and prevention to create a cohesive, community-wide approach and also provide the necessary resources and training to help school health professionals deliver evidence-based marijuana education and termination programs.

Policy Implications

Stakeholders could collaborate with organisations in the community to provide recreational, educational, and employment opportunities for youth as alternatives to marijuana use. There should be development and implementation of comprehensive drug education and prevention programs in schools, targeting the specific risk factors for marijuana use identified in research. Again, policies and enforcement around the legal age of marijuana use and purchase to limit adolescent access should be strengthened. Lastly, mental health screening and support services should be integrated within school systems to address underlying issues that may contribute to marijuana use.

Research Implications

A comprehensive epidemiological study should be conducted to help better understand the current prevalence of marijuana use among in-school adolescents in SVG. Multiple levels of influence, including individual, family, peer, and community-level risk, together with protective factors associated with marijuana use in this population, should be investigated. Further studies should evaluate the effectiveness of existing drug education and prevention programs to inform the development of more targeted and impactful interventions. Nonetheless, Government and school managements should collaborate with policymakers and practitioners to ensure research findings are translated into evidence-based policies and practices. Finally, there should be an exploration of the links between marijuana use and other health and social outcomes, such as academic performance, mental health, and risky behaviours, to champion a holistic approach to addressing the issue.

7. Declarations

Ethics approval and consent to participate

The authors declare that all methods used in this project complied with the 2024 revision of the Declaration of Helsinki. The Institutional Review Boards of the WHO, CDC, and the Ministry of Health, Wellness, and Environment of SVG approved the study's ethical standards. Trail Registration: "Global School-Based Student Health Survey 2018 (VCT_2018_GSHS_v01) Registered August 20, 2021, https://extranet.who.int/ncdsmicrodata/index.php/catalog/878." All individuals participating in the study gave their express, written consent.

Consent to publish

Not applicable.

Availability of data and materials

The dataset used in this study is publicly available through the WHO website (https://extranet.who.int/ncdsmicrodata/index.php/catalog/878/study-description#metadata-identification).

Conflict of interest statement

The authors report no conflicts of interest.

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Authors' contributions

JOS: Resources, Conceptualisation, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualisation, Writing-original draft, Writing-review and editing, Supervision. EK: Conceptualisation, Writing-original draft, Writing-review & editing. EDT: Conceptualisation, Writing-original draft, Writing-review & editing. MO: Conceptualisation, Writing-original draft, Writing-review & editing. DKA: Conceptualisation, Formal analysis,

Literature review, Writing-original draft, Writing-original draft. All authors contributed to and have approved the final manuscript.

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