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Serious Unintentional Injuries Among In-School Adolescents in Saint Lucia: A Further Analysis of Prevalence and Correlates

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Abstract

Serious injuries among adolescents are a leading cause of death and a global public health concern. This study examined the prevalence and correlates of serious injuries among in-school adolescents in Saint Lucia. Using a two-stage cluster sampling design to attain a fair population representation, we analysed data from the World Health Organization's 2018 Global School-based Health Survey among adolescents in the Eastern Caribbean Island of Saint Lucia. We used the Chi-square test and binomial logistic regression analysis with an adjusted odds ratio (AOR) at a 95 % confidence interval (CI). We observed that the prevalence rate of serious injuries among adolescents in Saint Lucia was 44.5 % (24.5 % male versus 20.0 % female). After controlling for other factors, serious injuries among in-school adolescents in Saint Lucia were predicted by sex (male) (AOR=1.110, 95 % CI=0.792-1.556), missing class without permission (AOR=1.308, 95 % CI=1.009-1.696), abusing alcohol (AOR=1.370, 95 % CI=1.114-1.684), experiencing physical attacks (AOR=1.669, 95 % CI=1.327-2.099), physical fight (AOR=1.527, 95 % CI=1.529-1.225) and being bullied (AOR=2.171, 95 % CI=1.712-2.753). Adolescent health promotion and injury prevention programmes should adopt multidisciplinary approaches to address these personal and psychosocial risk factors in Saint Lucia.

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1. Introduction

Injuries and violence account for a substantial proportion of the global disease burden in adolescents, especially in low-income and middle-income countries (Han et al., 2019). Findings from a Global School-based Student Health Survey (GSHS) for adolescents aged 12-15 years from Low-and Middle-Income Countries showed that the overall prevalence of physical attack, physical fighting, and serious injuries for the past 12 months were 35.6 %, 36.4 % and 42.9 %, respectively (Han et al., 2019). Prevalence of serious injuries among adolescents of school-going age in Liberia [71.0%] (Pengpid et al., 2021), Ghana [66.0 %] (Ackah et al., 2021), Panama [45.0 %] (Sarfo et al., 2023), Mauritius [39.0 %] (Mireku et al., 2021), Canada [24.0 %] (Gilbride et al., 2006), China [38.0 %] (Gao et al., 2019), and Europe [13.1 %-30.4 %] (Keyes et al., 2014) is alarming.

Generally, being a victim of childhood injuries has severe consequences on education, health and well-being (Han et al., 2019; Omaki et al., 2017; Priesman et al., 2018; Street, Jacobsen, 2017; Vos et al., 2019). Unintentional injuries such as fractures, concussions, open wounds, and burns are a common cause of morbidity and disability among adolescents in the global community (Gore et al., 2011; Branche et al., 2008) and may have social, behavioural, and economic consequences for the injured children as well as their families (Morrow et al., 2014). According to Peyton et al. (2017), 34.0 % of students who reported having at least one injury in the past year missed school contact hours and were admitted for medical treatment. Thus, the main factors associated with serious injuries per geographical location and population must be given serious attention to providing effective interventions to prevent adolescent injury occurrences. Consistently, serious injuries among adolescents have been associated with multiple risk factors (Ackah et al., 2021; Han et al., 2019; Mireku et al., 2021).

These factors include sex, age, grade, hunger, truancy, drugs and substance use, close friends, physical attacks, physical fights, bullying and suicidal behaviours (Ackah et al., 2021; Mireku et al., 2021). In a study by Han et al. (2019), serious injuries in 68 low-income and middle-income countries were collectively higher among boys than girls (47.8 % vs 37.5 %). This high prevalence might be because boys had higher prevalence rates for both physical attacks (41.0 vs 29.4 %) and physical fighting (45.5 % vs 26.9 %). A similar trend was observed among male school-going adolescents in Mauritius (Mireku et al., 2021). Although the magnitude of the sex difference varies greatly between countries and is based on societal gender role disparities, de Looze et al. (2019) explained that boys experienced more physical fighting, physical activity, and injuries than girls. Additionally, Mireku et al. (2021) noted that lower grades were associated with serious injuries among school-going adolescents in Mauritius.

Furthermore, Han et al. (2019) outlined that injury can be caused by a physical attack where one or more persons hit or strike someone or hurt someone with a weapon such as a stick, knife or gun or a physical fight where two students of similar strength or power choose to fight each other. Han et al. (2019) further clarified that injuries could occur in the form of fractures or dislocated joints, cuts, concussions, knocked out or inability to breathe, wound injuries, burns, or poison injuries. Studies have indicated that children exposed to violence and the resulting injuries are more likely to smoke, misuse alcohol and other drugs, engage in other risky behaviours, and are likely to endure a range of physical and mental illnesses later in life (Han et al., 2019; Priesman et al., 2018; Vos et al., 2019).

Moreover, studies have associated risk factors with bullying, hunger, truancy, marijuana smoking, alcohol use, parental neglect, and suicidal ideation (Ackah et al., 2021; Mireku et al., 2021; Pengpid et al., 2021). For example, an extensive literature review regarding serious injury risks shows that these factors are interrelated and vary across cultures among school-going adolescents (Baiden et al., 2017a; Baiden et al., 2017b; Brown, Plener, 2017; Costa et al., 2020; Fu et al., 2020; Liu et al., 2017; Monto et al., 2018; You et al., 2017; Xavier et al., 2018). Additionally, interpersonal stressors, neurobiological background, emotional dysregulation and adverse childhood experiences such as bullying (Brown, Plener, 2017), poor sleep quality and frequent nightmares (Lio et al., 2016), impulsive behaviours and feelings of loneliness (Costa et al., 2020) and bullying victimisation and depression (Sarfo et al., 2023) are significantly associated serious injuries.

Considering the paucity of evidence and interventions targeting serious injuries in the Caribbean Islands, Saint Lucia will fall short of meeting the United Nations' (UN, 2016) Sustainable Development Goals (SDGs) by the end of 2030. Specifically, to “ensure healthy lives and promote well-being for all at all ages” (Goal 3), and ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (Goal 4). Furthermore, understanding serious injuries and providing evidence-based measures using a national representative survey like the GSHS would provide generalisable findings that would form the baseline for adolescent injury prevention programmes and support. Thus, we analysed the GSHS data to examine the prevalence and associated factors of serious injuries among adolescents in Saint Lucia.

2. Methods

Research Design

We gathered and used data from the 2018 Global School-based Student Health Survey (GSHS) from the Saint Lucia context (WHO, 2021). The GSHS uses a self-administered questionnaire to collect data from students in a school-based survey. This cross-sectional study was conducted by the WHO, the United States Centres for Disease Control and Prevention (CDC) and Saint Lucia's Ministry of Health and Wellness (MoHW). The survey collected data on the behaviour, health status, and risk factors related to the principal cause of serious injuries and death among adolescents or young adults of school-going age. Using a cross-sectional survey design, data were gathered from WHO member countries interested in dealing with adolescents' health-related issues.

Ethical Consideration Followed in the Study

Ethical approval was obtained for this survey with the following Survey ID Number: LCA_2018_GSHS_v01. An initial pilot test was conducted before data collection to guarantee the reliability and validity of the survey questionnaire. The researchers strictly followed all ethical considerations and policies from the WHO, CDC, Saint Lucia's MoHW and the Ministry of Education (MoE) during the study period. Additionally, specific informed consent was separately obtained from the ministries, school administrators, instructors, parents of minors and students before data collection. The WHO Non-Communicable Disease Microdata Repository provides access to the dataset and information regarding the survey (WHO, 2021).

Sampling

The study participants were adolescents in grades 1-6 of the Saint Lucia educational system. The study used a two-stage cluster sampling design to attain representative information of all the selected schools across the country. In the first stage, the researchers selected schools using probability proportional to enrolment sizes. The researchers randomly selected classes in the second stage. All students found in the selected classes qualified to partake in the study. The response rates for the schools, students, and overall data were 100.0 %, 84.0 %, and 84.0 %, respectively. A total of 1,864 students participated in the survey (WHO, 2020).

Variables

We used two main categories of variables in the study: the outcome/dependent variable and the explanatory variables. The dependent variable was serious injuries identified or reported among the students. The dependent variable was a defined construct: “whether or not the student was seriously injured one or more times over twelve months before the survey.” The options ranged from zero (0) times to twelve (12) or more times. This study further dichotomised the responses. Those without injuries, i.e., zero injuries, were grouped as “no injury” and given 0 as a code, whereas those with at least one or more injuries were coded 1, as “serious injuries.” The explanatory variables were categorised as sociodemographic factors (sex, age, and grade), personal attributes (hunger, missed school without permission), drugs and substance use (amphetamine use, current marijuana smoking, and current alcohol use), and psychosocial (number of close friends, physical attacks, suicide (ideation, planning, and attempt), and bullying). Table 1 displays the explanatory variables used in the study.

Table 1. Definition of explanatory and measurement coding of variables

Age	How old are you?	0 = 12-14 1 = 15-17
Sex	What is your sex?	0 = Male 1 = Female
Grade	In what grade are you?	0 = Forms 1-3 1 = Forms 4-6
Hunger	Have you gone hungry most of the time or always because there was not enough food at home for the past 30 days?	0 = yes 1 = no
Close friends	Do you have close friends?	0 = yes 1 = no
Physical attack	Have you been attacked physically before?	0 = yes 1 = no
Suicidal ideation	During the past 12 months, did you ever seriously consider attempting suicide?	0 = yes 1 = no
Suicidal attempt	During the past 12 months, did you attempt suicide?	0 = yes 1 = no
Suicidal plan	During the past 12 months, did you make a plan about how you would attempt suicide?	0 = yes 1 = no
School truancy	During the past 30 days, did you miss classes or school without permission?	0 = yes 1 = no
Amphetamine use	During your life, did you use amphetamine or methamphetamine (also called ice or yellow)?	0 = yes 1 = no
Current use of alcohol	During the past 30 days, did you have at least one drink containing alcohol?	0 = yes 1 = no
Current marijuana smoking	During the past 30 days, did you use marijuana?	0 = yes 1 = no
Physically bullied	Have you been physically abused before?	0 = yes 1 = no

Data Analysis

In all the analyses, the sample weighting method was applied at the school, student, and sex within grade levels to make it representative of the adolescents of the school-going population in Saint Lucia and minimise bias on various trends and nonresponses. Some variables were recorded on a binary scale in this study, as in other GSHS studies (Aboagye et al., 2022; Ackah et al., 2021; Alikhani, 2014; Mireku et al., 2021; Sarfo et al., 2023). The current analysis did not include students aged 11 and below, and those above 18 years since their frequency was below 100 cases. We also used the multiple imputations (MI) technique to address the issue of missing data. The MI technique was used where the missing values exceeded 1.0 %. The missing data was 1.0 % to 14.0 % and were missing at random. Like a similar GSHS injury study (Mireku et al., 2021; Sarfo et al., 2023), we conducted five MI with the automatic imputation method to maintain data quality concerning missing values. Imputed values were compared reasonably to observed values and results using the complete case analysis. The final model goodness of fit was checked, and the results revealed no evidence of a lack of fit with our model's attempt to predict serious injuries significantly. We conducted two stages of primary analysis to measure variables strongly associated with serious injuries among the students in the adolescent group in Saint Lucia. First, we performed a bivariate analysis using Pearson Chi-square to estimate the relationship between serious injuries and the explanatory variables. Subsequently, we entered the variables that showed significant association ($p < 0.05$) into a binomial logistic regression model. The results obtained from the analysis were presented with a corresponding adjusted odds ratio (AOR) at a 95 % confidence interval (CI) [$p < 0.05$].

3. Results

Background Characteristics of the Adolescents in Saint Lucia

The prevalence of serious injuries among adolescents in Saint Lucia was 44.5 % (see Figure 1). The prevalence of serious injury was significantly high among male adolescents (24.9 %). Moreover, serious injuries were significantly higher (24.5 %) among male adolescents than female adolescents in St. Lucia. Also, serious injuries occurred more (24.8 %) among adolescents in Forms 1-4 than those in Forms 4-6 (19.7 %). Besides, adolescents who drink alcohol significantly experienced more serious injuries (24.1 %) than those who do not drink alcohol (20.4 %).

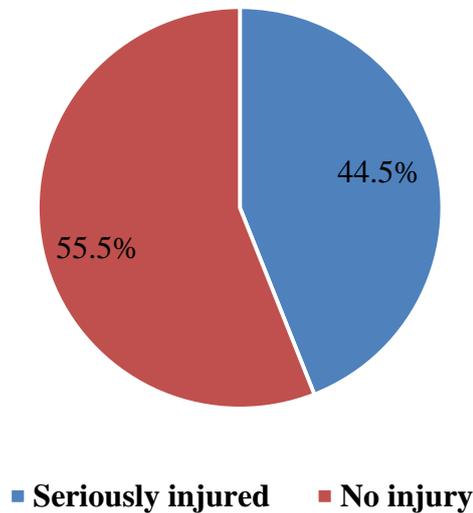


Fig. 1. Serious injuries among adolescents attending pre-tertiary schools in Saint Lucia

Chi-Square Analysis of Serious Injuries and Associated Factors

The Chi-square analysis we carried out revealed a significant association between serious injuries among adolescents in Saint Lucia and the following correlates: the age of adolescents ($\chi^2= 5.67, p < 0.05$), sex ($\chi^2= 45, p < 0.001$), grade ($\chi^2= 10.37, p < 0.001$), hunger ($\chi^2= 9.29, p < 0.01$), school truancy ($\chi^2= 32.40, p < 0.001$), amphetamine use ($\chi^2=39.35, p < 0.001$), marijuana smoking ($\chi^2= 33.91, p < 0.001$), alcohol use ($\chi^2= 29.80, p < 0.001$), having been physically attacked ($\chi^2= 96.48, p < 0.001$), engaging in physical fight ($\chi^2= 85.69, p < 0.001$), being bullied ($\chi^2=83, p < 0.001$), having suicide ideation ($\chi^2= 8.34.60, p < 0.01$), having suicide plan ($\chi^2=6.07., p < 0.05$), and attempted suicide ($\chi^2= 17.71, p < 0.001$). See Table 2 for details.

Table 2. Bivariate analysis of injuries among adolescents of school-going age in Saint Lucia (n = 1,869)

Variables	Serious injury		Chi-Square (χ^2)	ϕc	
	Injury (%)	No injury (%)			
Demographic					
Age (years)	12–14	465 (24.9 %)	522 (28.0 %)	5.67*	.055
	15–17	365 (19.6 %)	512 (27.5 %)		
Sex	Male	457 (24.5 %)	408 (21.9 %)	45.06***	.155
	Female	373 (20.0 %)	626 (33.6 %)		
Grade	Forms 1 – 3	462 (24.8 %)	498 (26.7 %)	10.37***	.075
	Forms 4 – 6	368 (19.7 %)	536 (28.8 %)		
Personal					
Hunger	Yes	97 (5.2 %)	78 (4.2 %)	9.29**	.071
	No	733 (39.3 %)	956 (51.3 %)		
Truancy	Yes	210 (11.3 %)	153 (8.2 %)	32.40***	.132
	No	620 (33.3 %)	881 (47.3 %)		

Drugs and substance use					
Amphetamine use	Yes	95 (5.1 %)	40 (2.1 %)	39.35***	.145
	No	735 (39.4 %)	994 (53.3 %)		
Marijuana use	Yes	157 (8.4 %)	99 (5.3 %)	33.91***	.135
	No	673 (36.1 %)	935 (50.2 %)		
Alcohol	Yes	449 (24.1 %)	428 (23.0 %)	29.83***	.126
	No	381 (20.4 %)	606 (32.5 %)		
Psychosocial					
Did not have Close friends	Yes	104 (5.6 %)	108 (5.8 %)	1.99	.033
	No	726 (38.9 %)	926 (49.7 %)		
Physically attacked	Yes	344 (18.5 %)	212 (11.4 %)	96.48***	.228
	No	486 (26.1 %)	822 (44.1 %)		
Physical fight	Yes	374 (20.1 %)	255 (13.7 %)	85.69***	.214
	No	456 (24.5 %)	779 (41.8 %)		
Bullied	Yes	294 (15.8 %)	175 (9.4 %)	83.66***	.212
	No	536 (28.8 %)	536 (46.1 %)		
Suicide ideation	Yes	245 (13.1 %)	244 (13.1 %)	8.31**	.067
	No	585 (31.4 %)	790 (42.4 %)		
Suicide plan	Yes	204 (10.9 %)	205 (11.0 %)	6.07*	.057
	No	626 (33.6 %)	829 (44.5 %)		
Suicide attempt	Yes	178 (9.5 %)	145 (7.8 %)	17.71***	.097
	No	652 (35.0 %)	889 (47.7 %)		

Logistic Regression Analysis of Significant Factors Associated with Serious Injuries

Table 3 presents the binomial logistic regression results on the factors associated with serious injuries among adolescents in Saint Lucia. The results show that being a male (AOR = 1.11, 95 % CI = 0.792-1.556), missing class without permission (AOR = 1.308, 95 % CI = 1.009-1.696) abusing alcohol (AOR = 1.370, 95 % CI = 1.114-1.684), experiencing physical attacks (AOR = 1.669, 95 % CI = 1.327-2.099), physical fight (AOR = 1.527, 95 % CI = 1.529-1.225) and being bullied (AOR = 2.171, 95 % CI = 1.712-2.753), added significance to the model of serious injury occurrence among adolescents in Saint Lucia.

Table 3. Correlates of serious injuries among adolescents in Saint Lucia (n = 1,869)

	B	Wald test (z-ratio)	AOR	95 % confidence interval for odds ratio	
				Lower	Upper
Demographic					
Age	0.105	0.369	1.110	0.792	1.556
Sex (Male)	0.504***	21.768	1.656	1.340	2.047
Grade	0.186	1.179	1.205	0.861	1.686
Personal					
Hunger	0.133	0.579	1.142	0.811	1.609
Truancy	0.269*	4.113	1.308	1.009	1.696
Substance use and abuse					
Amphetamine Use	0.380	2.960	1.463	0.948	2.256
Marijuana Use	0.212	1.705	1.236	0.899	1.699
Alcohol Consumption	0.315**	8.923	1.370	1.114	1.684
Psychosocial					
Physical attack	0.512***	19.193	1.669	1.327	2.099
Physical fight	0.423***	13.684	1.527	1.220	1.911
Bullied	0.775***	40.933	2.171	1.712	2.753
Suicide ideation	0.083	0.300	1.086	0.808	1.459
Suicide Plan	-0.033	0.040	.968	0.704	1.330

Suicide Attempt	0.094	0.319	1.098	0.793	1.521
Constant	-6.511***	102.725	0.001		

Notes: *p < 0.05, **p < 0.01, ***p < 0.001; Hosmer and Lemeshow test (goodness of fit), $\chi^2(8) = 11.890$, p = 0.156.

The study examined the prevalence and correlates of serious injuries among adolescent students in Saint Lucia. We found 44.5 % of serious injuries among these school-going adolescents. Using a nationwide representative sample of adolescents between the ages of 12 and 17, the overall prevalence of serious injuries found among the adolescents of school-going age in Saint Lucia was relatively low [44.5 %] as compared with the rates in Ghana [66.0 %] (Ackah et al., 2021) and Liberia [71.0 %] (Pengpid et al., 2021). However, the prevalence of serious injuries in Saint Lucia was higher than the prevalence of injury values recorded in Europe [13.1 %-30.4 %] (Keyes et al., 2014), Canada (24.0 %) (Gilbride et al., 2006), China (38.0 %) (Gao et al., 2019) and Mauritius (39.0 %) (Mireku et al., 2021). Comparatively, the prevalence of serious injuries among adolescents in Saint Lucia gives the impression that adolescent risky behaviours and factors contributing to injuries exist and need attention.

Our study also showed that sex (male) significantly predicts serious injuries among adolescents in Saint Lucia. Males were 1.6 times more likely to be injured than females. Several studies have reported varied results concerning sex differences' role in sustaining adolescent injuries. Our study was supported by de Looze et al.'s (2019) gender inequality and sex differences in physical fighting, physical activity, and injury among adolescents across 36 countries. Accordingly, the study suggested that since culturally based gender inequality relates to sex differences in some adolescent health behaviours, it is essential to reduce inequalities in the health of future generations by encouraging public health policy to target social and cultural factors that shape perceived gender norms in young people. Recent studies like Han et al. (2019) and Mireku et al. (2021) also observed serious injuries higher among males than females.

Besides the sex differences, the current study also reported a significant association between personal factors such as hunger and truancy and psychosocial factors such as substance use, physical attacks, physical fights, bullying, and suicidal behaviours. For instance, more participants who complained of hunger were involved in injurious behaviours or injured than their counterparts who were not. A similar trend was seen with truancy, amphetamine use, marijuana use, alcohol, physical attacks, physical fights, being bullied, and suicide attempts. Like existing evidence on adolescent injury behaviours, the correlates or risk factors are often multifactorial with complex associations (Alikhani, 2014; Branche et al., 2008; Costa et al., 2021; Denny et al., 2016; Han et al., 2019; Mireku et al., 2021; Morrow et al., 2014; Peyton et al., 2016; Priesman et al., 2016; You et al., 2019). In a multi-item measure of self-injury study, a higher prevalence of physical fights, alcohol, marijuana, suicidal ideation, plan and hard drug use existed among participants with serious injuries in the United States (Monto et al., 2015).

Thus, injury behaviours share similar correlates among adolescents in developed and developing countries (Han et al., 2019; Mireku et al., 2021; Monto et al., 2015). Available evidence further suggests that significant correlations among the explanatory variables are related and demand multidisciplinary approaches to address them (Alikhani, 2014; Branche et al., 2008; Costa et al., 2021; Denny et al., 2016; Han et al., 2019; Mireku et al., 2021; Morrow et al., 2014; Peyton et al., 2016; Priesman et al., 2016; You et al., 2019). For instance, the adolescents who reported using hard drugs, getting hungry and being truant exhibited more injury behaviours than their counterparts who did not (Mireku et al., 2021). Consequently, the government of Saint Lucia should develop parent-school management partnerships with stakeholders to address these risk factors. Adolescents in Saint Lucia may benefit from these evidence-based initiatives and the adoption of policies that will support their physical and psychological well-being.

5. Conclusion

Our study indicated a moderate prevalence of serious injury among teenagers in Saint Lucia using data from the 2018 GSHS that are nationally representative. As a result of this discovery, serious injury is now a mildly concerning public health issue in Saint Lucia. In addition to the moderate rates of serious injury prevalence, other explanatory factors are associated with serious injury among teenagers in Saint Lucia. Regarding the bivariate analysis, we discovered that adolescents with the following characteristics were at a high risk of suffering serious injuries: age

(between 12 and 14 years), sex (being male), lower grade (1-3), truancy, hunger, substance use (using amphetamine, marijuana, and alcohol), physical behaviour (physical attack and physical fight), the experience of bullying, and suicidal behaviour (suicidal ideation, suicide plan, and suicide attempt). Additionally, being a male, being truant, drinking alcohol, engaging in aggressive behaviour (physical attacks and physical fights), and experiencing bullying were all strongly related to serious injury among teenagers in Saint Lucia. If this rate of serious injuries persists, Saint Lucia will not be able to offer inclusive and equitable quality education by 2030, stimulate possibilities for lifelong learning, or ensure that these school-age adolescents live healthy lives. Thus, the government, school administration, parents, and other stakeholders must develop policies and programs to help shape adolescents' school conduct. Additionally, Saint Lucia will be able to meet several of the SDG targets (UN, 2016), especially SDGs 3.5 and 4.1 (strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful alcohol use; ensure inclusive and equitable quality education; and promote opportunities for lifelong learning for all), by devising proactive measures to reduce the occurrence of serious injuries. Moreover, in order to support their psychological and mental health needs, students must have access to mental health resources on campus.

6. Strengths and limitations

Using a national dataset, our study is one of the first to examine serious injury among adolescents in Saint Lucia. Due to the representativeness of our sample, the research contributes to our understanding of the risk factors for serious injury among these adolescents in Saint Lucia. On the other hand, because of the GSHS database's cross-sectional nature, we could not establish a causal relationship between the several risk factors and serious injury. Additionally, a single item was used to measure several mental health dimensions, such as bullying and suicide behaviours (suicidal thoughts, plans, and attempts). A question structure like this may not completely capture all clinical disorders or symptoms for diagnostic purposes. Despite these drawbacks, it is significant that the findings of our study will serve as the starting point for additional analysis and youth intervention programs in Saint Lucia.

7. Implications for Research and Intervention

In this study, we have endeavoured to respond to essential research questions about the prevalence and correlates of serious injury among adolescents in Saint Lucia. Explicitly stating, we sought to determine the predisposing/risk factors of serious injury among adolescents. We conclude by briefly underscoring some possible research and serious injury prevention interventions.

Our findings acknowledge that serious student injury is related to demographic, individual, drug and substance use, and psychosocial factors. The educational system has developed to provide additional opportunities for student-teacher interaction. Due to this circumstance, pupils now consider their school a second home. As a result, school employees now serve as pupils' second parents. Consequently, schools in Saint Lucia had to offer mental health services and support networks for adolescents through behaviour monitoring, direction, and counselling on stress management and how to handle physical assault and bullying (Chaniang et al., 2022). To do this, it would be crucial to designate a few school staff members as mental health focus points or call points and teach them the fundamental skills for spotting pupils who are most at risk of serious injury (Mireku et al., 2021).

Additionally, Saint Lucia's school system needs to move away from a one-dimensional approach to addressing issues with adolescent mental health and instead consider a much broader and nuanced perspective. We hope the schools investigate a serious injury risk assessment tool available online where students can answer standardised questions about a serious injury at predetermined times. The objective is to identify each student's risk factors for serious injury and provide appropriate therapy and referrals considering those risks (Haas et al., 2003; Mireku et al., 2021).

Adolescent substance use behaviours are a further promising topic for serious injury prevention interventions. Mainly, amphetamine, marijuana, and alcohol usage were related to several types of serious injury. Additionally, researchers have found that student drug and substance usage has a detrimental impact on poor academic performance (Botvin, Griffin, 2003). Preventing student substance use would have a positive ripple effect by reducing hostility and

enhancing academic performance. Botvin and Griffin (2013) emphasised that to stop students from using alcohol and other drugs, the educational structure or environment must not be disregarded.

In general, we advise schools to offer opportunities for skill development through athletics, music, and other pursuits that pique adolescents' interests and serve as a substitute for drug usage. We hope that establishing cooperative efforts between policymakers, the school, and other pertinent stakeholders to address social and behavioural issues, particularly substance use among students, will significantly reduce serious injury, improve mental health, and improve academic outcomes.

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9. Author contributions

JOS conceived the idea of the study. JOS and PO downloaded and analysed data and prepared tables. JOS, PO, TPD, NIG, COBO, RSS and KO wrote the manuscript. All authors read and approved the final version of the manuscript.

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11. Competing interests

The authors declare no competing interests.

References

- Aboagye et al., 2022 – Aboagye, R.G., Mireku, D.O., Nsiah, J.J., Ahinkorah, B.O., Frimpong, J.B., Hagan, J.E., ..., Seidu, A.A. (2022). Prevalence and psychosocial factors associated with serious injuries among in-school adolescents in eight sub-Saharan African countries. *BMC Public Health*. 22(1): 1-8.
- Ackah et al., 2021 – Ackah, M., Salifu, M.G., Boakye, H. (2021). Factors Associated with Serious Injuries among Adolescents in Ghana: Findings from 2012 Global School Health Survey. *Scientific World Journal*.
- Alikhani, 2014 – Alikhani, S. (2014). A profile of unintentional injuries among Iranian adolescents: findings from the first Health Behavior in School-Aged Children Survey. *International Journal of School Health*. 1(2): 1-5.
- Baiden et al., 2017a – Baiden, P., Stewart, S.L., Fallon, B. (2017). The mediating effect of depressive symptoms on the relationship between bullying victimisation and non-suicidal self-injury among adolescents: Findings from community and inpatient mental health settings in Ontario, Canada. *Psychiatry Research*. 255: 238-247.
- Baiden et al., 2017b – Baiden, P., Stewart, S.L., Fallon, B. (2017). The role of adverse childhood experiences as determinants of non-suicidal self-injury among children and adolescents referred to community and inpatient mental health settings. *Child Abuse & Neglect*. 69: 163-176.
- Botvin, Griffin, 2003 – Botvin, G.J., Griffin, K.W. (2003). Drug abuse prevention curricula in schools. In Z. Sloboda, W. J. Bukoski (Eds.). *Handbook of drug abuse prevention: Theory, science, and practice* (pp. 45-74). New York: Kluwer Academic/Plenum Publishers.
- Branche et al., 2008 – Branche, C., Ozanne-Smith, J., Oyebite, K., Hyder, A.A. (2008). *World report on child injury prevention*. [Electronic resource]. URL: [https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Peden+M%2C+Oyebite+K%2C+Ozanne-Smith+J%2C+Hyder+AA%2C+Branche+C%2C+Rahman+AF%2C+et+al.+World+report+on+child+injury++prevention.+Geneva%3A+WHO%2FUNICEF%3B+2008.&btnG=\(date+of+access:+25.07.2022\)](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Peden+M%2C+Oyebite+K%2C+Ozanne-Smith+J%2C+Hyder+AA%2C+Branche+C%2C+Rahman+AF%2C+et+al.+World+report+on+child+injury++prevention.+Geneva%3A+WHO%2FUNICEF%3B+2008.&btnG=(date+of+access:+25.07.2022)).
- Brown, Plener, 2017 – Brown, R.C., Plener, P.L. (2017). Non-suicidal self-injury in adolescence. *Current Psychiatry Reports*. 19: 20-28.
- Chaniang et al., 2022 – Chaniang, S., Klongdee, K., Jompaeng, Y. (2022). Suicide prevention: A qualitative study with Thai secondary school students. *Belitung Nursing Journal*. 8(1): 60-66. DOI: <https://doi.org/10.33546/bnj.1746>

- Costa et al., 2021 – Costa, R.P.D.O., Peixoto, A.L.R.P., Lucas, C.C.A., Falcão, D.N., Farias, J.T.D.S., Viana, L.F.P., ..., Trindade-Filho, E.M. (2021). Profile of non-suicidal self-injury in adolescents: interface with impulsiveness and loneliness. *Jornal de Pediatria*. 97: 184-190.
- de Looze et al., 2019 – de Looze, M., Elgar, F.J., Currie, C., Kolip, P., Stevens, G.W. (2019). Gender inequality and sex differences in physical fighting, physical activity, and injury among adolescents across 36 countries. *Journal of Adolescent Health*. 64(5): 657-663.
- Denny et al., 2016 – Denny, V.C., Cassese, J.S., Jacobsen, K.H. (2016). Nonfatal injury incidence and risk factors among middle school students from four Polynesian countries: The Cook Islands, Niue, Samoa, and Tonga. *Injury*. 47(5): 1135-1142.
- Fu et al., 2020 – Fu, X., Yang, J., Liao, X., Ou, J., Li, Y., Chen, R. (2020). Parents' attitudes toward and experience of non-suicidal self-injury in adolescents: A qualitative study. *Frontiers in Psychiatry*. 11: 538756.
- Gao et al., 2019 – Gao, C., Chai, P., Lu, J., Wang, H., Li, L., Zhou, X. (2019). Probing the Psychosocial Correlates of Unintentional Injuries Among Grade-School Children: A Comparison of Urban and Migrant Students in China. *Journal of Child and Family Studies*. 2011(2019): 1713-1723. DOI: <https://doi.org/10.1007/s10826-019-01378-9>
- Gilbride et al., 2006 – Gilbride, S.J., Wild, C., Wilson, D.R., Svenson, L.W., Spady, D.W. (2006). Socio-economic status and types of childhood injury in Alberta: A population based study. *BMC Pediatrics*. 6(1): 1-10. DOI: <https://doi.org/10.1186/1471-2431-6-30/TABLES/6>
- Gore et al., 2011 – Gore, F.M., Bloem, P.J., Patton, G.C., Ferguson, J., Joseph, V., Coffey, C., ..., Mathers, C.D. (2011). Global burden of disease in young people aged 10–24 years: A systematic analysis. *The Lancet*. 377(9783): 2093-2102.
- Haas et al., 2003 – Haas, A.P., Hendin, H., Mann, J.J. (2003). Suicide in college students. *American Behavioral Scientist*. 46(9): 1224-1240. DOI: <https://doi.org/10.1177/0002764202250666>
- Han et al., 2019 – Han, L., You, D., Gao, X., Duan, S., Hu, G., Wang, H., ..., Zeng, F. (2019). Unintentional injuries and violence among adolescents aged 12-15 years in 68 low-income and middle-income countries: A secondary analysis of data from the Global School-Based Student Health Survey. *The Lancet Child & Adolescent Health*. 3(9): 616-626.
- Keyes et al., 2014 – Keyes, K.M., Susser, E., Pilowsky, D.J., Hamilton, A., Bitfoi, A., Goelitz, D., ... Kovess, V. (2014). The health consequences of child mental health problems and parenting styles: Unintentional injuries among European schoolchildren. *Preventive Medicine*. 67: 182-188. DOI: <https://doi.org/10.1016/j.ypmed.2014.07.030>
- Liu et al., 2017 – Liu, X., Chen, H., Bo, Q.G., Fan, F., Jia, C.X. (2017). Poor sleep quality and nightmares are associated with non-suicidal self-injury in adolescents. *European Child & Adolescent Psychiatry*. 26(3): 271-279.
- Mireku et al., 2021 – Mireku, D.O., Sarfo, J.O., Ansah, E.W., Apaak, D., Armah, C. (2021). Prevalence and correlates of serious injuries among adolescents in Mauritius. *The Scientific World Journal*.
- Monto et al., 2018 – Monto, M.A., McRee, N., Deryck, F.S. (2018). Non-suicidal self-injury among a representative sample of US adolescents, 2015. *American Journal of Public Health*. 108(8): 1042-1048.
- Morrow et al., 2014 – Morrow, V., Barnett, I., Vujcich, D. (2014). Understanding the causes and consequences of injuries to adolescents growing up in poverty in Ethiopia, Andhra Pradesh (India), Vietnam and Peru: A mixed method study. *Health Policy and Planning*. 29(1): 67-75.
- Omaki et al., 2017 – Omaki, E., Rizzutti, N., Shields, W., Zhu, J., McDonald, E., Stevens, M.W., Gielen, A. (2017). A systematic review of technology-based interventions for unintentional injury prevention education and behaviour change. *Injury Prevention*. 23(2): 138-146.
- Oppong Asante et al., 2017 – Oppong Asante, K., Kugbey, N., Osafo, J., Quarshie, E.N.B., Sarfo, J.O. (2017). The prevalence and correlates of suicidal behaviours (ideation, plan and attempt) among adolescents in senior high schools in Ghana. *SSM - Population Health*. 3(May). Pp. 427-434. DOI: <https://doi.org/10.1016/j.ssmph.2017.05.005>
- Pengpid et al., 2021 – Pengpid, S., Hinneh, J.T., Peltzer, K. (2021). Prevalence and correlates of single and multiple unintentional non-fatal injuries among school-going adolescents in Liberia. *Injury*. 52(4): 787-792. DOI: <https://doi.org/10.1016/j.injury.2020.11.048>
- Peyton et al., 2016 – Peyton, R.P., Ranasinghe, S., Jacobsen, K.H. (2016). Injuries, Violence, and Bullying Among Middle School Students in Oman. *Oman Medical Journal*. 32(2): 98-105.

[Priesman et al., 2018](#) – Priesman, E., Newman, R., Ford, J.A. (2018). Bullying victimisation, binge drinking, and marijuana use among adolescents: results from the 2013 National Youth Risk Behavior Survey. *Journal of Psychoactive Drugs*. 50(2): 133-142.

[Street, Jacobsen, 2017](#) – Street, E.J., Jacobsen, K.H. (2017). Prevalence of sports injuries among 13-to 15-year-old students in 25 low-and middle-income countries. *Journal of Community Health*. 42(2): 295-302.

[Sarfo et al., 2023](#) – Sarfo, J.O., Amoadu, M., Obeng, P., Kordorwu, P.Y., Adams, A.K., Gyan, T.B., ..., Asiedu, I. (2023). Prevalence and factors associated with serious injuries and aggressive behaviours among in-school adolescents in Panama. *Dialogues in Health*. 2: 100103.

[WHO, 2021](#) – World Health Organization. Global School-Based Student Health Survey 2018: Saint Lucia. NCD Microdata Repository. [Electronic resource]. URL: <https://extranet.who.int/ncdsmicrodata/index.php/catalog/877/study-description>

[United Nations, 2016](#) – United Nations. The Sustainable Development Goals Report 2016. New York: United Nations Department of Economic and Social Affairs, 2016.

[Vos et al., 2020](#) – Vos, T., Lim, S. S., Abbafati, C., Abbas, K.M., Abbasi, M., Abbasifard, M., ..., Bhutta, Z.A. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*. 396(10258): 1204-1222.

[Xavier et al., 2018](#) – Xavier, A., Cunha, M., Pinto-Gouveia, J. (2018). Daily peer hassles and non-suicidal self-injury in adolescence: Gender differences in avoidance focused emotion regulation processes. *Journal of Child and Family Studies*. 27: 59-68.

[You et al., 2017](#) – You, J., Jiang, Y., Zhang, M., Du, C., Lin, M. P., Leung, F. (2017). Perceived parental control, self-criticism, and non-suicidal self-injury among adolescents: Testing the reciprocal relationships by a three-wave cross-lag model. *Archives of Suicide Research*. 21(3): 379-391.