Suicidal behaviour and ideation in Guyana: A systematic literature review

Charlotte Shaw,[a,*] Jaimee Stuart,[b] Troy Thomas,[c] and Kairi Kõlves[a]

[a]Australian Institute for Suicide Research and Prevention, WHO Collaborating Centre for Research and Training in Suicide Prevention, School of Applied Psychology, Griffith University, Level 1, Building M24 Psychology, 176 Messines Ridge Road, Mt Gravatt Campus, Brisbane, QLD 4122, Australia
[b]School of Applied Psychology, Griffith University, Brisbane, Australia
[c]Faculty of Natural Sciences, University of Guyana, Guyana

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Summary

Background The suicide rate in Guyana has consistently ranked as one of the highest in the world. This systematic review synthesises and critically analyses the existing literature on suicidal behaviours and ideation in Guyana.

Methods Systematic review with narrative synthesis was conducted following PRISMA guidelines. PubMed, PsychInfo, CINAHL and SCOPUS databases were searched until 31st March 2021. Articles which included the analysis of suicidal behaviour or suicidal ideation using data collected in Guyana were eligible for inclusion. Articles relating to the Jonestown mass murder-suicide event were excluded. This review was pre-registered with PROSPERO [CRD42021247669].

Findings The search resulted in 318 articles, of which 24 met eligibility for inclusion. The majority were quantitative (*n*=18), relating to suicide mortality (*n*=9), and suicide attempt and suicidal ideation (*n*=9). Additionally, qualitative (*n*=5) and mixed-method (*n*=1) papers investigated the experiences of those bereaved by suicide, gatekeepers of suicidality, and adolescent students. Eleven studies were multinational, whilst 13 focused on Guyana. The quality of the publications varied.

Interpretation Despite high annual suicide rates in Guyana, published research is very limited. This review found preliminary evidence for key risk groups; males, female youth, and Indo-Guyanese ethnicity. Pesticide poisoning was identified as the most common method for suicide in Guyana. There is a need for local research investigating the context and narrative of suicide to inform culturally tailored prevention strategies. This study was limited to a narrative synthesis and may be impacted by publication bias.

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Registration Pre-registered in PROSPERO [CRD42021247669].

Introduction

Suicide is a major public health issue and reducing the global suicide mortality rate is one of the targets of the United Nations Sustainable Development Goals. It is estimated that 77% of all suicide deaths occur in low-and-middle income countries (LMICs), where most of the world's population live.[1] Even though the majority of suicides occur in LMICs, it is widely acknowledged that published suicide research from these countries is limited, with the majority of suicide research deriving from and concerning the populations of high-income countries.[2–4] Nomothetic research informing global suicide prevention guidelines has served to fill this LMIC suicide research gap. However, there are concerns surrounding the effectiveness of universal suicide prevention recommendations, particularly as evidence highlights the importance of culture specific suicide research and prevention.[5]

Whilst the global rate of suicide has been decreasing, the Americas is the only WHO region which is recording an increase in suicide.[1] Guyana's estimated age standardised suicide rate has ranked in the top ten globally and the highest within the Americas region since 2000, when the World Health Organization (WHO)

*Corresponding author.
E-mail address: charlotte.shaw@griffithuni.edu.au (C. Shaw).

started reporting their estimates for member states.[6] Guyana is an upper-middle-income, ethnically diverse, anglophone Caribbean country located on the northeast coast of South America. Guyana has a complex history of colonisation by multiple European nations, which involved slavery from West Africa and indentured labour from India, China and Portugal.[7,8] Independence was achieved in 1966 and the population of approximately 750,000 currently consists of 40% Indian heritage (Indo-Guyanese), 29% African heritage (Afro-Guyanese), 10·5% indigenous (Amerindian), 20% who identify as 'Mixed', and Chinese, Portuguese and White cumulatively contributing less than 1%.[9]

In an attempt to combat the high suicide mortality, the government developed the countries' first National Suicide Prevention Plan (NSPP) in 2014.[10] The NSPP declared the goal of reducing suicidal behaviour by 20% by year 2020. The plan included the implementation of a national PR campaign ('Choose Life – Say No to Suicide'), training of primary health care staff in mental health management, and the implementation of a suicide prevention help line, and other activities. Coordination and publication of this plan demonstrated a strong commitment to suicide prevention, considering that only 38 countries in the world were known to have a suicide prevention strategy or plan in 2018.[11] In parallel with the government's formal response, there is also an active grassroots suicide prevention movement with a focus on raising awareness and reducing suicide stigma.

Despite government efforts at suicide prevention, spanning various projects and investment of considerable resources, the suicide rate has not substantially improved in recent times (see Figure 1). In 2019, Guyana's age standardised suicide rate was estimated as 40·9 per 100,000, the highest rate for the country in nearly two decades and the second highest suicide rate in the world.[1] Such findings evidence that there has been limited impact of recent suicide prevention activities, which may be related to inadequate resourcing and/or competing priorities, but also by the dearth of local suicide research. The NSPP references only one local research report,[12] while all other referenced resources are WHO guidelines and studies conducted in other countries. The WHO guidelines serve as a good foundation for suicide prevention broadly, however by their own admission, they need to be contextualised using local knowledge.[13] It is possible that Guyana's complex history and diverse ethnic and cultural composition are contributing to the high suicide rates, however the problem is only being addressed using globally recommended strategies. This further highlights the need to systematically analyse existing literature about suicidality in Guyana.

This systematic review aims to synthesise and critically analyse the existing literature available on suicidal behaviours and ideation in Guyana, which can inform future prevention efforts, including the next national suicide prevention plan, as well as identify gaps for future researchers to pursue.

Method

Search strategy and selection criteria

The presentation of this systematic review is compliant with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement[14] and was pre-registered in PROSPERO [CRD42021247669].

Studies which analysed suicidal behaviour or suicidal ideation using data collected in Guyana were

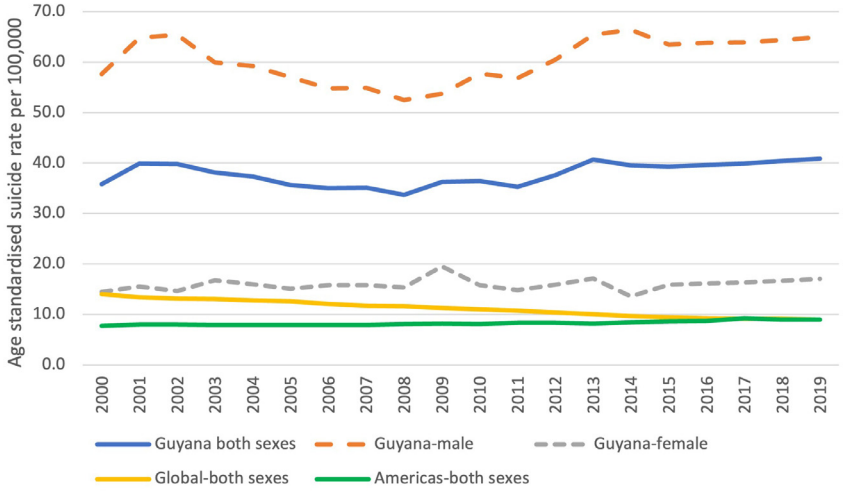

Figure 1. Age-standardised rates of suicide (per 100,000) for Guyana based on WHO Global Health Estimates (2000-2019),[6] with the Americas and global rate included for comparison.

eligible for inclusion. Articles relating to the Jonestown mass murder-suicide event were excluded, as almost all the people who died were American citizens. All eligible literature reference lists were manually checked for further eligible references.

Studies on suicidal behaviour and ideation in Guyana were identified after a comprehensive search of four electronic databases from inception until 31st March 2021: PubMed, PsychInfo, CINAHL and SCOPUS. Key words used in the search were "Guyana" AND ("suicid*" OR "parasuicid*" OR "self-harm" OR "self harm" OR "poison*"). There were no language restrictions during the search, however only English language publications were identified.

First the entire search result was checked of duplicates, then CS and KK screened the titles and abstracts for relevance. Subsequently, full text articles were retrieved and independently screened by CS and KK for eligibility. Inclusion conflicts were resolved by discussion until consensus was reached.

Data extraction and synthesis

Data extraction involved reviewing full texts of the selected literature and extracting author/s, publication year, aim/s, year/s of study, study design, study population/sample, measures, data sources, suicide measure, and key findings. Extraction of information was completed by CS and cross checked by KK. Methodological quality assessment of the literature was completed by CS and cross checked by KK, utilising a quality assessment checklist,[15] as applied in previous reviews.[16,17] The qualitative and quantitative studies were assessed using distinct criterion specific to the respective methodologies, relating to sample size, reporting, analyses and other features. This was completed to assess the internal validity of included studies.[18] Any discord was settled through discussion. Whilst papers were assessed for quality, none were excluded on this basis, due to the paucity of literature available. The heterogeneity of studies identified precluded a meta-analysis and thus a narrative synthesis is presented, with papers grouped by method; quantitative or qualitative and mixed-method.

Role of the funding source

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report

Results

A search of four databases resulted in 318 papers, of which 78 were duplicates. The remaining 240 papers were title and abstract screened and 40 papers identified for full text screening, with a final 24 articles meeting eligibility for inclusion. A flow-diagram of the study selection is presented in Figure 2.

Tables 1 and 2 provide an overview of the 24 included papers. Eleven of the papers identified included analysis of data from more than one country including Guyana, whilst 13 focused specifically on Guyana. Methods included 18 quantitative, five qualitative and one mixed-methods paper. Quantitative studies included a mix of different study designs: ecological (n=9), cross-sectional (n=6), and case series (n=3). All qualitative and mixed-method papers and seven quantitative papers were published in the last five years (since 2017). The articles presented analysis of secondary data (n=15) or primary data (n=9). Secondary data sources included WHO mortality data (n=6), Global School-based Health Survey (n=5), Ministry of Health Guyana surveillance data (n=2), demographic yearbook (n=1), and the Guyana Women's Health and Life Experiences Survey (n=1). Primary data sources included focus groups (n=5), clinical assessment (n=3), interviews (n=3), and self-report questionnaire (n=1).

The majority of the papers identified focussed on the child, adolescent, or youth population (n=16), whilst others related to the general population (n=7) and women (n=1). The quantitative papers are grouped into those relating to suicide mortality (n=9) or suicide attempt and suicidal ideation (n=9). The remaining qualitative and mixed-method papers are discussed together (n=6).

Quantitative studies

Suicide mortality. There were nine articles identified that reported on suicide mortality in Guyana. Seven were multinational studies and two focussed on Guyana. Four of the multinational papers focussed on child and adolescent suicide mortality, highlighting Guyana's high global ranking. They reported that Guyana's child and adolescent suicide rates significantly increased between the decades 1990-1999 and 2000-2009.[19–22] Pritchard and Hean[23] investigated undetermined death rates as potential indicators of hidden suicides and reported that Guyana has the highest undetermined death rates for males and females in the Latin American region. Shah[24] analysed the association between suicide and ageing and reported a significant negative relationship between suicide and age for females in Guyana ($p < 0{\cdot}0001$). Whilst the final multinational study focussed on the relationship between suicide and a range of country level factors, including urbanisation, education and climate.[25]

The papers focussed on suicide mortality in Guyana used Ministry of Health surveillance data. The surveillance analysis found that the majority (77·6%–83·3%) of people who have died by suicide in Guyana are

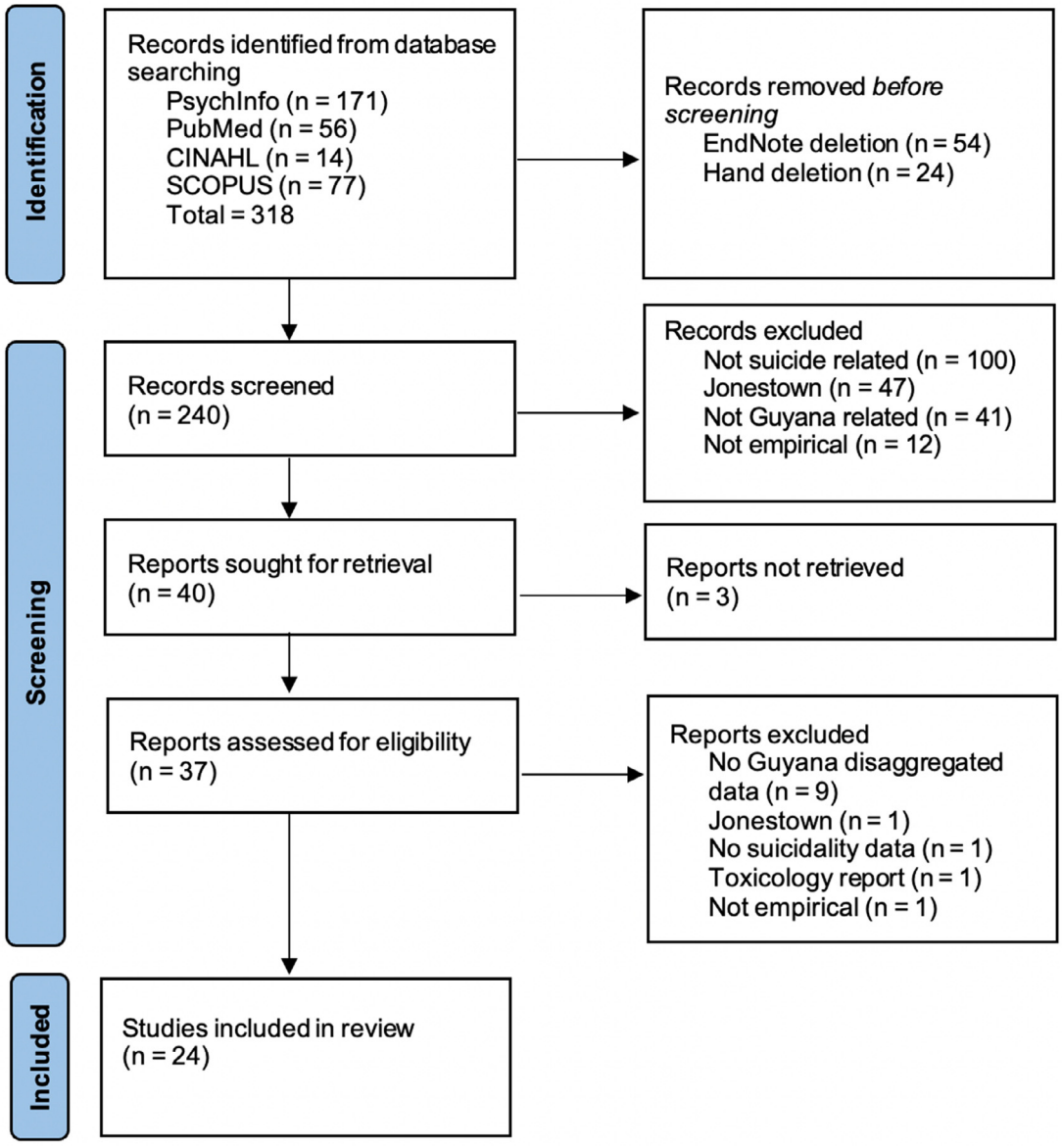

Figure 2. Study selection flow-diagram based on PRISMA guidelines.[14]

identified as being of Indo-Guyanese ethnicity.[26,27] Furthermore, Shako[27] identified males as accounting for the most suicides (78%) and the ingestion of poison as the most common method of suicide (64·5%).

Suicide attempt and suicidal ideation. This systematic review identified papers focussed on suicide attempt (*n*=1), suicidal ideation (*n*=6) and both (*n*=2). These included three case series and six cross-sectional studies. Five papers analysed the Global School-based Health Survey data. This survey collects data from students aged 13-17 on their behavioural risk and protective factors, including suicidal ideation in the last 12 months, and has been conducted twice in Guyana; 2004 and 2010.[28] These papers identified that suicidal ideation in Guyana is more common in female students than male students, which was consistent across the 2004 and 2010 surveys.[29,30] Female suicidal ideation increased from 21·4% in 2004 to 29·1% in 2010, whilst male suicidal ideation did not significantly increase.[31] Guyana (2010 data) had the highest prevalence of student suicidal ideation in the Latin American Caribbean region[32] and was third highest within a sample of 49 primarily LMIC countries, after Zambia and Kenya.[31] There was also a paper focused on pregnant Guyanese women and the effects of physical violence, which reported that the experience of physical violence during

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Denton, Musa & Hoven, 2017[34]	To identify risk and protective correlates for suicide in vulnerable youth in Guyana.	2014	Case-series	Youths (6-21 years old) living in institutional care (*n*=25). Purposive and convenience sampling.	DSM-5 Level 1 Cross-Cutting Symptom Measure (*n*=15) and Behavioural Assessment Schedule for Children, 2nd Edition (BASC-2) (*n*=21)	Not applicable	"Have you EVER tried to kill yourself?" and "In the last 2 weeks, have you thought about killing yourself or committing suicide?" (p. 191)	36% (*n*=9) of youths reported a previous suicide attempt. 12% (*n*=3) reported suicidal ideation in last 2 weeks. Interpersonal skills may be a protective factor against suicide attempts and suicidal ideation.	11 (Low)
Edwards, 2016[26]	To sociologically analyse Guyanese suicide data by investigating macrosociological correlates between regions.	2003-2007	Ecological	Guyana	Suicide rate, religious integration, political integration, social cohesion.	Ministry of Health suicide surveillance data (2003-2007). Poverty Reduction Strategy paper (Government of Guyana, 2011), Guyana National Census (2002)	Not specified. But Guyana has been using ICD-10 since 2000	Suicide rate correlates positively with political integration (0·62) and social integration (0·49). Suicide correlates negatively with religious integration (-0·74). Extends Durkheims theory of suicide to account for Guyana's context.	8 (Low)
Elia et al., 2020[32]	To investigate the association between economic development, overweight/obesity, and suicidal ideation with planning in Latin American youth.	2009-2013	Ecological	Adolescents (10-19yo) from 21 Latin American Countries (*n*=55,295). Guyanese youth (*n*=2,362)	Suicidal ideation, suicide plan, body mass index, national development	Individual level: Global School-based Health Survey (GSHS) 2010; Aggregated level: gross domestic product (GDP) per capita or human development index (HDI) (ranged from 2009-2013,	"During the past 12 months, did you ever seriously consider attempting suicide?", "During the past 12 months, did you ever make a plan about how you would attempt suicide?" (p. 7)	7·5% of male youths and 17·5% of female youths in the LAC region reported suicidal ideation with planning over the last 12 months. Guyana had the highest rate (18·1%) of youth suicidal ideation with planning for the region (males 8·5%, females 19·4%). Economic	17 (High)

Table 1 *(Continued)*

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
						depending on data availability)		and human development were not significantly associated with suicidal ideation/planning in the region.	
Ellner, 1977[25]	To determine the country level factors associated with suicide rates.	1971	Ecological	40 countries	Suicide rate, homicide, area, population, climate, languages, religions, density, urbanisation, gross national product, per capita income, agriculture, industry, birth rate, death rate, life expectancy, physicians, literacy, education, newspapers, radios, telephones	Demographic Yearbook (1971), The Encyclopaedia Britannica (1973), The New York Times Encyclopedic Almanac (1973), BioMed programme BMDX73 (The City University of New York, 1973).	Not specified. Could not locate demographic yearbook definition	Determined many national factors significantly correlated with suicide rate (p<·001). Birth rate (r=-·73), percentage of agricultural workers (r=-·57), and homicide rate (r=-·54) were negatively correlated with suicide rate. Per capita income (r=·68), climate (r=·62), literacy (r=·62), media usage (r=·50), life expectancy (r=·61), and percentage of industrial workers (r=·59) were positively correlated with suicide rate. Factor analysis produced five societal prototypes. Guyana suicide rate listed as 0/100,000.	12 (Low)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Fleming & Jacobsen, 2009[61]	To investigate the association of bullying and health factors (mental and physical)	2003-2006	Cross-sectional	School aged students (~13-15yo) from 19 low-and-middle income countries (*n*=104,614). Guyanese sample (*n*=1,212). Probability sampling used.	Bully victimisation, sadness/hopelessness, loneliness, insomnia, suicidal ideation, smoking, alcohol use, drug use and sexual intercourse.	Global School-based Health Survey (GSHS) 2003-2006. Guyana sample surveyed in 2004.	"During the past 12 months, did you ever seriously consider attempting suicide?", "During the past 12 months, did you make a plan about how you would attempt suicide?"	Bully victimization is associated with reduced mental health and higher participation in risk behaviours. This effect varies by age, sex and country. 28·1% of Guyanese bullied students experienced suicidal ideation in the last 12 months. 12·5% of non-bullied Guyanese students experienced suicidal ideation in the last 12 months.	17 (High)
Kolves & De Leo, 2014[19]	To report worldwide suicide trends in children aged 10−14 years from two decades: 1990−1999 and 2000−2009.	1990-2009	Ecological	81 countries	Child (10-14) suicide absolute numbers, country population numbers.	WHO mortality database and population data from the World Bank.	Not specified. The WHO dataset uses ICD classification, Guyana was using ICD-9 & ICD-10 during these two decades	Globally, the child suicide rate is relatively stable. However, in South America and Central Asia, child suicide rates increased for both sexes between the two decades. For Guyana, there was a significant increase for both sexes between the two decades (p=0·030)	17 (High)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Kolves & De Leo, 2016[20]	To report worldwide suicide trends in adolescents aged 15-19 years from two decades: 1990-1999 and 2000-2009.	1990-2009	Ecological	81 countries	Adolescent (15-19) suicide absolute numbers and country population numbers.	WHO mortality database and population data from the World Bank.	ICD-8 and ICD-9 codes E950-E959, ICD-10 codes X60-X84). Guyana was using ICD-9 & ICD-10 during these two decades	Globally, there was a decline in adolescent suicide for both sexes. For Guyana the adolescent suicide rate for both sexes significantly increased between the two decades (p<·001).	18 (High)
Kolves & De Leo, 2017[21]	To analyse and describe suicide methods in children and adolescents aged 10−19 years in different countries/ territories worldwide.	2000-2009	Ecological	101 countries/ territories	Youth (10-19) suicide data (*n*= 86,280) and country population numbers.	WHO Mortality Database and population data from the World Bank.	ICD-10 (X60-X84)	Globally, the most frequent suicide method used by children and adolescents is hanging, followed by pesticide poisoning for females and firearms for males. Guyana was placed in the pesticide cluster of countries. Between 2000-2009, Guyana had the second highest suicide rate for male youths and the highest suicide rate for female youths.	18 (High)

Table 1 *(Continued)*

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
McCandless, 1968[36]	To investigate the psychiatric condition, demographic profile, precipitating factors and motivations of hospitalised suicide attempt patients in Guyana.	1965	Case-series	36 suicide attempt patients (2 died); Male = 15, Female = 21. East Indian = 24, African = 2, Mixed = 8, Other = 2.	Psychiatric evaluation, precipitating events, diagnostic classification and demographic data	Not applicable	Admission to hospital as an attempted suicide or suspected attempted suicide.	67% of suicide attempt patients identified as East Indian. 97% of patients had attempted suicide by poisoning (barbiturates, corrosives or insecticides). 22% of the suicide attempts were associated with depressive syndromes, 28% were associated with schizophrenic syndromes and 50% were not associated with signs of depression.	10 (Low)

Table 1 *(Continued)*

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Miller & Contreras-Urbina, 2021[33]	To investigate the relationship between physical violence during pregnancy with women's health and suicidal ideation in Guyana	2017	Cross-sectional	Guyanese females aged >18 years (*n*=1,391). Geographically stratified random sample by rural/urban/suburban/hinterland.	Physical violence during pregnancy, controlling partner behaviour, women's health and suicidal ideation.	Guyana Women's Health and Life Experiences Survey (2017)	Not specified. Report that they adapted the WHO Violence Against Women and Girls prevalence survey for the Guyanese setting.	The experience of physical violence during pregnancy was significantly positively associated with suicidal ideation (p<·001). Other factors positively associated with suicidal ideation included rural and suburban location, lack of family support, lack of partner choice, experience of physical violence as a child, and controlling partner behaviour.	16 (Medium)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Page et al, 2013[31]	To describe the prevalence of suicidal ideation in adolescents across 49 countries.	2003-2010	Cross-sectional	Youths aged 13-15 years from 49 countries (*n*=266,694). Probability sampling used. Guyanese samples: 2004 (*n*=1,212) and 2010 (*n*=2,392).	Self-report questionnaire.	Global School-based Health Survey (GSHS)	During the past 12 months, did you ever seriously consider attempting suicide?	Mean prevalence of suicidal ideation in school attending youths 13-15 years in low and middle-income countries was 15·3%. There were variations between countries, regions and sex. Guyana's 2010 prevalence of suicidal ideation was the second highest for the study sample (23·2%). In Guyana the prevalence of suicidal ideation in female youths increased from 21·4% to 29·1% between 2004 and 2010 and for males it increased from 16·0% to 16·8%.	16 (Medium)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Pritchard & Hean, 2008[23]	To investigate whether Latin American countries have higher undetermined death rates in youths and young adults and to compare the undetermined death rates in LAC with major developed countries.	1994-2002 (varies between countries)	Ecological	18 Latin American countries.	Suicide rates and other external causes of deaths (coded Y10—35 and Y87—89 by ICD-10).	WHO mortality statistics for 18 Latin American Countries in 1994-1996.	ICD-10, except Guatemala and Guyana who used ICD-9.	The ratio of suicide to undetermined death was significantly higher than for major developed countries in 13 of the 18 Latin American countries. Guyana had the highest undetermined death rates for males (506ppm) and females (167ppm). Ratio of 3·47:1 undetermined deaths per suicide for males and 7·26:1 females. This is much higher compared to the average suicide and undetermined death ratio for major developed countries: 0·11:1 for males and 0·15:1 for females.	15 (Medium)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Quinlan-Davidson, et al, 2014[22]	To report suicide mortality trends among young people (10-24yo) in the Americas.	2001-2008	Ecological	Young people (10-24) from 19 countries/territories in the Americas (*n*=1,233,251)	Age standardised suicide rate per 100,000, suicide method, average annual variation in suicide mortality rates, and relative risks for suicide.	WHO mortality data.	ICD 10th edition. using codes X60-X84	The average suicide rate for young people (10-24yo) in the Americas was 5·7 per 100,000. Males die by suicide at higher rates (7·7/100,000) than females (2·4/100,000) across the region. Guyana had the highest suicide rate (22·4/100,000); male suicide rate (26·8/100,000) was higher than females (18·1/100,000). Hanging was the most common method used in the region (49·4%), however poisoning was the primary method of suicide in Guyana for people aged 10-24yo.	18 (High)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Rudatsikira, et al, 2007[29]	To identify the prevalence and correlates of suicidal ideation among adolescent students in Guyana.	2004	Cross-sectional	School students (13-17yo), *n*=1197. Probability sampling was used.	Suicidal ideation in past 12 months, bullying, depression, alcohol use, gender, smoking, friendships, and parental supervision.	Global School-based Health Survey 2004.	"During the past 12 months, did you ever seriously consider attempting suicide?"	18% of Guyanese students (14·9% of males, 21·6% of females) reported experiencing suicidal ideation in the last 12 months. Being bullied and having a history of depression increased the odds of suicidal ideation. Whilst having close friends and understanding parents reduced the odds of suicidal ideation.	17 (High)
Shah, 2012[24]	To examine the association between suicide and ageing.	Average suicide rate of latest 5 consecutive years available between 1983-2007.	Ecological	97 countries	Suicide rates from the 7 age brackets ranging from 16-24 to >75 years, gross domestic product, % of GDP spent on healthcare, life expectancy, and child mortality (<5 years).	WHO mortality data, WHO country data and United Nations Development Program country websites.	Not specified. The WHO dataset uses ICD classification, Guyana was using ICD-9 until 2000 and ICD-10 since.	There was much variation globally. The relationship between suicide rate and age was not significant for Guyanese males. There was a significant negative relationship between suicide and age for females in Guyana (p<·0001).	11 (Low)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Shako, 2020[27]	To identify the sociodemographic and cultural factors associated with suicide and method of suicide among people aged >15 years in Guyana.	2015	Case-series	Guyana 2015 recorded suicides >15yo (*n*=220).	Suicide data, including sociodemographic factors (age, sex, occupation, method of suicide, region) and cultural factors (ethnicity, religion).	Ministry of Public Health Guyana suicide surveillance data.	Not specified. Guyana has used ICD-10 since 2000.	Males accounted for 72·3% of people who died by suicide. 50% of people who died by suicide were 23-48 years old and 57·3% were employed. 81·4% of people who died by suicide were identified as East Indian ethnicity. Religion had 54·1% missing cases. Coastal Region 6 had the highest crude number of suicides. Poison was the most common method of suicide (64·5%), followed by hanging (32·7%).	11 (Low)

Table 1 (Continued)

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Siziya, et al, 2017[30]	To analyse prevalence and correlates of suicidal ideation in adolescent students in Guyana.	2010	Cross-sectional	Guyanese students aged 13-17 (*n*=2,392). Probability sampling.	Suicidal ideation in past 12 months, age, gender, food security, anxiety, loneliness, close friends, truancy, bullying, attacked, in a fight, smoking, parental understanding, alcohol abuse.	Global School-based Health Survey 2010.	"During the past 12 months, did you ever seriously consider attempting suicide?" (p. 417)	23·5% of adolescent survey respondents reported suicidal ideation in the last 12 months (16·4% of males and 29·7% of females). This rate has increased since 2004, when survey results were 18·4% (14·9% of males, 21·6% of females). Being female, anxious, lonely, bullied, or using alcohol/ drugs increased the odds of suicidal ideation. Whilst having close friends and parental understanding reduced the odds of suicidal ideation.	16 (Medium)

Table 1 *(Continued)*

Author/s, year	Aims	Time	Study design	Study population/ sample	Measures	Data sources	Suicide Measure	Key findings	Quality
Thornton, et al, 2019[35]	To identify clinical correlates of suicidal ideation and attempt/ plan among vulnerable youths in South Africa and Guyana.	Not specified	Case-series	South African (*n*=175) and Guyanese (*n*=15) vulnerable youths (11-21yo). In South Africa the youths lived away from parents, but with relatives. In Guyana, all the youth participants lived in institutional care. Sampling not specified.	Child Behavior Checklist (CBCL) was used in South Africa and Behavior Assessment System for Children (BASC-A) was used in Guyana.	Not applicable	In South Africa, "I think about killing myself" (suicidal ideation) and "I deliberately try to hurt or kill myself" within the last 6 months. In Guyana, youth were asked if they had thoughts of suicide in the past 2 weeks (suicidal ideation) and if they had a future plan, had ever attempted suicide.	Social stress was the greatest clinical risk factor for vulnerable youth suicidal ideation and attempt/ plan. 40% (*n*=6) of Guyanese vulnerable youths had experienced suicidal ideation in the past 2 weeks. 60% (*n*=9) reported a past suicide attempt or future plan.	13 (Medium)

***Table 1*: Quantitative study characteristics and key findsings.**

Author/s, year	Aim	Study design	Study population/ sample	Data collection method	Qualitative method	Suicidality definition	Key findings	Quality
Anthony, et al, 2017[43]	To explore nurses attitudes and experiences of suicidality in Guyana.	Qualitative	Nurses/nurse assistants employed at a private hospital in Georgetown (all identified as Afro-Guyanese) (*n*=9). All had either professional and/or personal experience with suicide or suicide attempt. A combination of convenience, purposive, and snowball sampling was used.	Focus group	Thematic analysis	Not specified.	4 key themes: family issues of suicide patients, cry for help (impulsivity), lack of support (for suicidality in community), and how nurses cope after treating these patients.	13 (Medium)
Arora & Persaud, 2020[39]	To investigate barriers to youth mental health help seeking in Guyana.	Qualitative	Private school convenience sample in Guyana (region unspecified), including 17 adults (teachers, administrative workers, school allied community workers), 40 students (14-17yo). Majority of adults (82·3%) and students (88%) identified as East Indian.	Focus groups (staff) and interviews (students)	Grounded theory, thematic analysis	Not specified	Identified barriers for help-seeking included (1) shame and stigma, (2) fear of negative parent response, (3) limited awareness (and distrust) of mental health services. Suicide prevention recommendations included (1) need for culturally informed interventions, (2) integration of culturally informed interventions to schools and (3) the role of the government and community in suicide prevention efforts.	14 (Medium)

Table 2 (Continued)

Author/s, year	Aim	Study design	Study population/ sample	Data collection method	Qualitative method	Suicidality definition	Key findings	Quality
Arora, et al, 2020[38]	To identify risk and protective factors for suicide among Guyanese youth.	Qualitative	Private school convenience sample in Guyana (region unspecified), including 17 adults (teachers, administrative workers, school allied community workers), 40 students (14-17yo). Majority of adults (82·3%) and students (88%) identified as East Indian.	Focus groups (staff) and interviews (students)	Grounded theory, thematic analysis	Not specified	Risk factor themes reported: (1) Demographic (adolescence, East Indian ethnicity, rural location), (2) pressure and expectations of family, (3) adults' poor responses to youth disclosure of emotional distress, (4) limited coping with stressful life events, and (5) exposure to suicide in the community. Protective factor themes reported: (1) positive social support and (2) involvement in community activities.	14 (Medium)
Groh, et al, 2018[42]	To explore the attitudes and experiences of family members who have experienced suicide loss.	Qualitative	Adults with an experience of suicide loss (*n*=10). All identify as East Indian. Convenience sampling of suicide bereaved; recruited by a community leader.	Focus group	Generic, thematic analysis	Not specified	Four themes identified: (1) perceived causes of suicide (limited community development, poverty, unrecognised mental health issues, pesticide access), (2) potential solutions (recreation, mental health services), (3) barriers to help seeking (limited services, stigma, confidentiality concerns), and (4) community reactions to suicide (gossip and stigma).	13 (Medium)

Table 2 *(Continued)*

Author/s, year	Aim	Study design	Study population/ sample	Data collection method	Qualitative method	Suicidality definition	Key findings	Quality
Johnson, 2019[44]	To explore police officers experience of engaging with adolescent users of the suicide prevention help line.	Qualitative	Police suicide prevention call centre staff (*n*=13). All female. Purposively sampled. Discussed adolescent users of the suicide help line (<23 years).	Focus group	Not specified. Alluded to thematic analysis	Not provided, authors refer to 'suicidal callers'.	The most common concerns for adolescents who call the suicide prevention help line related to romantic relationship problems, family conflict, sexual orientation conflict and peer pressure. The police officers experience emotionality relating to their counselling role, including anger, sadness, frustration and despair.	9 (Low)
Persaud, et al, 2019[41]	To measure the feasibility and effectiveness of suicide prevention gatekeeper training for teachers in Guyana.	Mixed methods: Intervention and qualitative	Teachers and staff from a private secondary school (*n*=16).	Quantitative: Self-report questionnaire; QPR training provided as intervention. Qualitative: Interviews (n=7)	Content analysis.	Not specified	Quantitative: Participants showed a significant increase in knowledge of suicide prevention (p<·001) and reduced judgemental attitudes (p=·04) post training. Qualitative: analysis concluded that suicide prevention gatekeeper training deemed culturally acceptable and feasible for Guyanese school context.	Quant - 13 (Medium) Qual — 11 (Low)

***Table 2*: Qualitative/mixed study characteristics and key findings.**

pregnancy was significantly positively associated with suicidal ideation.[33]

Of the three case series papers, two of these studied suicidal ideation and suicide attempts or plans for Guyanese youth in institutional care.[34,35] Results showed that 12%-40% of participants reported experiencing suicidal ideation in the two weeks prior to being interviewed. It was also reported that 36% of vulnerable youths had experienced a previous suicide attempt,[34] and this figure rose to 60% when including a previous suicide plan.[35] However, it should be noted that both studies had limited sample sizes. Lastly, McCandless[36] conducted a case-series study of 36 suicide attempt patients at Georgetown Public Hospital in 1965 and reported that 67% of his patients were Indo-Guyanese (compared with 49% of the population), 58% female and 97% had attempted suicide by poisoning (30% had ingested an insecticide solution). This was the only paper which used an acutely suicidal clinical sample.

Qualitative and mixed-methods studies

The qualitative (n=5) and mixed-method (n=1) papers utilised a school community, gatekeepers and bereaved relatives to understand suicidality in Guyana. Gatekeepers are people who are 'strategically positioned to recognise a person in crisis, identify behavioural warning signs of suicide, refer a person to help, and perform any other additional capabilities that may help a distressed individual'.[37] The gatekeepers presented in these articles include police counsellors, nurses, teachers, and school staff.

A series of three papers related to research conducted in a private secondary school. Staff focus groups and student interviews were used to understand the risk and protective factors for suicide among Guyanese youth,[38] and barriers to mental health help seeking.[39] Question Persuade Refer gatekeeper training (QPR[40]) was then conducted with teachers and other staff at the school, measuring knowledge of suicide and attitude towards suicide before and after training.[41] This mixed-methods analysis was the only intervention paper identified in the systematic review and found that school staff showed a significant increase in knowledge of suicide prevention and that QPR training was culturally acceptable for the Guyanese context.

Groh, Anthony[42] explored the attitudes and experiences of family members who have experienced a suicide loss. The focus group analysis identified issues such as pesticide access, limited mental health services and suicidality stigma. The police counsellors and nurses from the other papers shared their experiences of engaging with suicidality in the community.[43,44]

There were some common themes reported amongst the qualitative and mixed-method articles. Confidentiality concerns were raised as a barrier to help seeking for suicidal ideation in three of the articles.[39,42,44] Also mentioned was a need for stronger social structures and community activities as suicide prevention measures.[38,39,42,43] Furthermore, police and nurses both discussed the need for more training so that they can effectively assist people experiencing suicidal ideation or recovering from a suicide attempt.[43,44]

Quality assessment

Quality ratings of quantitative papers ranged from 8 (Low) to 18 (High), with a median rating of 16 (Medium). Poorly defined measures of suicidal behaviour, and weak justification for analyses and conclusions limited the quality ratings of quantitative papers. The quality ratings of qualitative papers ranged from 9 (Low) to 14 (Medium), with a median rating of 13 (Low). The key features which limited these scores were insufficient description or quality of the study design, sampling strategy and data collection method, as well as weak connection to a theoretical framework (see *Supplementary Tables* 3 and 4 for further details).

Discussion

This is the first systematic literature review of suicidality in Guyana. We identified only 24 papers, revealing that despite having consistently high rates of suicide for multiple decades, there is limited research published on this important topic. Almost half of the papers were multinational studies and the majority analysed WHO suicide mortality or GSHS suicidal ideation data. The Guyana specific papers provided an emerging profile of those dying by suicide in Guyana as being male and Indo-Guyanese.[26,27] Yet there is no research targeting these groups, nor have sex and ethnicity been analysed together. Multiple studies reported poisoning as the most common method of suicide in Guyana.[21,22,27,36] The poison used is not consistently specified, however pesticide poisoning is listed as the most frequent method of suicide in Guyana.[10] This review also identified limited knowledge about the circumstances, meaning, and motives of suicidality in Guyana. The qualitative studies further presented anonymity and confidentiality concerns of people experiencing suicidal ideation.[39,42,44]

Guyana is the only anglophone country in South America and has a population of diverse cultural heritage. This review found that people of Indo-Guyanese ethnicity are over-represented for and have the highest rate of suicide in Guyana. People of Indian indentured labour heritage are reported as over-represented for suicide in various countries where they were transported, including Fiji[17] and Malaysia.[45] A history of indentured Indian labour is shared by several countries in the Americas region, however Guyana, Suriname, and Trinidad and Tobago have the highest population shares of Indian diaspora.[46] Suriname has consistently had the

second highest rate of suicide in the Americas region since 2000, whilst Trinidad and Tobago currently rank eighth.[6] The predominant profile of suicide in Suriname and Trinidad and Tobago is similar to Guyana: male, Indian heritage, and pesticide poisoning as the most common method.[47–49] A study in Suriname noted extreme poverty, low education and family conflict as common characteristics of people who had attempted suicide.[47] Furthermore only 5% of people had accessed mental health care prior to the suicide attempt and a mere 30% would be willing to speak to a mental health care professional. Therefore, informal community suicide prevention activities may be an appropriate strategy to prevent suicide amongst this key risk group, developed using a participatory process.

There is only limited literature exploring the context of suicidality in Guyana. One striking study was conducted by an American psychiatrist in 1965,[36] who psychoanalysed hospitalised suicide attempt patients. He identified that most patients were Indo-Guyanese and seemed to have limited emotional vocabulary. It was hypothesised that the Indo-Guyanese culture may inhibit emotional expression, particularly anger. He further theorised that injured pride and feelings of shame motivated suicide attempts and that the suicide attempt was an act of interpersonal communication, spawned by familial conflict. Whilst this study is dated, it provides valuable clinical insights as the analysis goes much deeper than mere numbers. Furthermore, these hypotheses are similar to those proposed in a more recent psychological autopsy study in Suriname.[48] Interpersonal conflict is an established risk factor for suicide[50] and interpersonal conflict resolution should be considered as an important feature of suicide prevention programs in Guyana.

This review identified a focus on child and youth suicidality research in Guyana. This emphasis is potentially warranted for females, as the WHO's crude suicide rates for 2019 identified the 15-24 age group as having the highest rate of suicide (per 100,000) for female Guyanese.[6] There is another peak for females during the 35-44 age bracket and then the suicide rate decreases with age. However, for males in Guyana, the suicide rate is consistently high across all age brackets.[6] Therefore, suicide research in Guyana needs to consider the whole lifespan, particularly for males. Gender stratified results are important, as the different curves can indicate variances in motivation between males and females. The focus on youth research is potentially part of the broader suicide research skew towards adolescents.[51]

Pesticide poisoning is the most common method of suicide in Guyana and is suggested to account for 30% of global suicide deaths.[52] Pesticide regulation and management was acknowledged in the NSPP as a key focus area[10] and this prompted the distribution of 300 pesticide storage cabinets to farmers between 2014–2016.[53] However, there has been no reduction in suicides during this time and research has since demonstrated that pesticide storage boxes are not an effective suicide prevention measure.[54] Rather, restricting the importation of highly lethal pesticides and introducing less toxic pest management strategies are recommended as effective population level suicide prevention strategies, with only minimal impact on agricultural yields.[55] The Pesticides and Toxic Chemicals Control Board[53] is continually updating the list of prohibited pesticides and toxic chemicals, however, potentially need more support regarding enforcement and substitute promotion.[56]

The anonymity and confidentiality concerns noted in the qualitative studies could be related to the legal status of suicide in Guyana. Guyana is one of only 25 countries in the world that has a specific law for the punishment of a suicide attempt.[57] The statute in Guyana states that "Everyone who attempts to commit suicide shall be guilty of a misdemeanor and liable to imprisonment for two years".[58] In practice, it is uncommon for those who attempt suicide to be charged or imprisoned in Guyana, however criminalisation of suicide is considered by the WHO to be a contributing factor towards underreporting and help seeking hesitancy.[13] For example, this law is suspected to impact suicide help line utilisation rates in Guyana, especially given that the service is operated by law enforcement. There is also no evidence demonstrating that having a law against suicide acts as a deterrent.[57] Fortunately, suicide decriminalisation is said to have bipartisan political support in Guyana and the current Health Minister has committed to overturning this legislation.[59]

Methodological considerations and future directions

This review has strengths and limitations which need to be acknowledged. The heterogeneity of studies identified precluded any meta-analysis and this limits the results to a narrative form. The conclusions from the narrative synthesis are constrained by the varied quality of papers identified. However, the strength of our review includes the quality assessment of studies, which highlights the need for high quality studies to progress the understanding of suicidality in Guyana. The study designs were mainly from the lower tiers of evidence, including many cross-sectional and ecological studies. Notably, there was only one intervention study, involving a pilot gatekeeper training of school staff.[41] To advance suicide prevention in Guyana, it would be beneficial to conduct a representative population survey, gathering a range of psychosocial data, including potential suicide risk factors. Further original studies are also needed to analyse the profile of those most vulnerable to suicide in Guyana and investigate their suicidal pathway, as this would assist in the development of effective interventions.

This review identified a recent increase in qualitative research in Guyana, which mirrors the increase in qualitative studies in suicide research more generally.[60] Qualitative and quantitative research both have an

important role to play in the development of suicide prevention strategies. Timely quantitative data is important to be able to effectively monitor suicidal behaviours and evaluate interventions, whilst qualitative data provides context and lived experience information which further strengthens suicide prevention activities.

We recognise that much intervention, monitoring, and research has been completed by public agencies, the University of Guyana, and community organisations. These are not reported on here because these activities have either not been empirically measured and/or published. The decision to exclude this grey literature introduces an inherent publication bias.

This systematic review represents a starting point for future research to expand upon. There is a need for a variety of different types of studies to gain a deeper understanding of suicidal behaviour on the individual and population levels, including higher tier research designs. It is recommended that future research focus on understanding the histories of those who have died by suicide or those who have attempted suicide. For example, a psychological autopsy can provide rich data and explore the context of suicide, as suggested by the Ministry of Health.[12] There is also a need for research which targets the emergent key risk groups of males, female youths, and people who identify as Indo-Guyanese. The findings from these proposed research avenues can then be used to develop cost-effective, evidence based and socio-culturally tailored suicide intervention and prevention activities. In addition, there is a need for postvention resources and support for those bereaved by suicide. Furthermore, decriminalisation of suicide attempts and further restrictions on access to toxic pesticides are recommended as universal suicide prevention strategies. Importantly any strategies implemented need to be critically evaluated to ensure their effectiveness.

Conclusion

This is the first systematic review on suicidal behaviours and ideation in Guyana. The results have identified males, female youths and Indo-Guyanese as key risk groups, and pesticide poisoning as the most common method of suicide. Guyana is motivated and active in suicide prevention; however the suicide rate continues to rise. There is a need for more local suicide research targeting the above groups to supplement the WHO global guidelines and inform the development of evidence-based and culturally tailored suicide prevention activities.

Contributors

CS: conceptualization, investigation, formal analysis, data curation, writing-original draft, writing-review & editing; JS: conceptualization, supervision, writing-review & editing; TT: supervision, writing- review & editing; KK: conceptualization, formal analysis, data curation, supervision, writing- review & editing.

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Data sharing statement

Search results can be made available upon request to the corresponding author.

Declaration of interests

The authors declare no competing interests.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.lana.2022.100253.

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