



Research Article

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Prevalence of Attempted and Completed Suicide in Children 8-15 Years of Age in Fiji Central Division



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Abstract

Suicide is defined as a self-destructive act deliberately carried out where there is a clear expectation of death. The global suicide mortality rate in 2016 was 10.5 per 100,000. Suicide is a growing concern globally and in the Pacific Island countries. It is perceived from cases admitted in CWMH that there are increasing numbers of attempted and completed suicide in Fiji. However to date there have been limited studies in the Pacific Islands. Therefore, the aim of this study was to describe the prevalence and pattern of attempted and completed suicide in children 8-15 years of age in Fiji's Central Division.

A retrospective descriptive study was performed by reviewing police reports and admission folders in the past 5 years from January 2015 to December 2019. Prevalence rate of suicide in children aged 8-15 years was determined. Data were tabulated using Microsoft Excel 2013 version and statistical analysis was performed using SPSS. A total of 47 children who had attempted or completed suicide on police reports and admission folders at CWMH were included. Completed suicide rate in 2015 was 16.8 and a decline to 9.3 per 100,000 in 2019 which was lower than global suicide rate of 10.5 in 2016 was observed. Poisoning (62%) was the most commonly used method of suicide whereas hanging was the second most common method of suicide with a higher mortality rate of 80% (OR 10.2; p <0.002). Attempted and Completed suicide in children (8-15 years) in Fiji's Central Division was slightly lower than global suicide rate but considering that suicide rates are mainly in adult population, so this rate in children is alarming and is a serious concern for a small Pacific Island Country like Fiji. The issue of suicide must be addressed comprehensively through multi-sectorial organizations to institute effective preventative measures to minimize loss of lives at this very young age.

Keywords: Attempted Suicide, Completed Suicide, Suicidal Behavior

Abbreviations: CWMH: Colonial War Memorial Hospital, FNU: Fiji National University, WHO: World Health Organization, DSM: Diagnostic and Statistical Manual of Mental Disorders, FOID: Fijian of Indian Descent, IT: Itaukei, O: Other ethnicity, Paraquat: Paraquat Dichloride or Gramoxone (N,N'-dimethyl-4,4'-bipyridinium dichloride), PICU: Pediatric Intensive Care Unit

Introduction

Suicide is defined as a self-destructive act, deliberately carried out where there is a clear expectation of death. Worldwide, more than 800,000 people die due to suicide each year. The suicide mortality rate in 2016 was 10.5 per 100,000, which means about one death every 20 seconds [1-3]. The male to female ratio varies between 4 to 1 (Europe and Americas) and 1.5 to 1 (Eastern Mediterranean and Western Pacific Region) and is highest in

developed countries [4]. These suicide figures are probably still an underestimation of the actual number of cases due to a lack of reporting especially in developing and low-income countries.

In May 2013, the Sixty-sixth World Health Assembly adopted the first-ever Mental Health Action Plan in which it was decided to reduce suicide rate by 10% by 2020 [5-7].

There is a lack of definitive data on worldwide suicide mortality trends, mainly because of differences in reporting procedures and data availability. The WHO has maintained cross-national data on suicide mortality since 1950, but since some governments treated suicide as a social or political issue rather than a health problem, the validity of pre-existing data has diminished leading to low estimates in suicide mortality rate [8]. Despite this, the data maintained by WHO suggests that the global rate of suicide increased between 1950 and 2004, especially for men, and data-based projections suggest that suicide numbers will increase by as much as 50 percent from 2002 to 2030 [9].

The significant cross-national variability reported in rates of suicide and suicidal behaviors appear to reflect the true nature of this behavior and is not due to variation in research methods. There is consistency in young age of onset of suicide ideation in multiple countries with rapid transition from suicidal thoughts to suicidal behavior. The difference in male to female ratio is often attributed to the use of more lethal suicide methods with greater aggressiveness by males as compared to females, resulting in males having higher completed suicides numbers than females [8].

The presence of a pre-existent psychiatric disorder has been reported as a major factor for suicidal behavior. Psychological factors such as depression, anhedonia, impulsiveness, and high emotional reactivity may increase psychological distress leading to suicide. Biological factors such as familial transmission of suicidal behavior may be a contributing factor, but researchers have failed to identify genetic loci for suicide in molecular genetic studies in light of the complex nature of the phenotype [10,11]. Psychiatric, psychological, and biologic factors may predispose a person to suicidal behavior, and stressful life events interact with these factors to further increase risk of suicide. Most often suicidal behaviors are preceded by stressful life events, which include family and romantic conflicts and the presence of legal/disciplinary problems [12,13]. Protective factors such as religious beliefs, religious practice and spirituality have been associated with a decrease in suicide risk [14,15].

The standardized annual rate of suicide for the whole population of Fiji in 2002 was 15 per 100,000 for males and 11 per 100,000 for females with considerable differences for the different ethnic groups. Indigenous Fijians (Itaukei) was 4 per 100,000 population, while Fijian of Indian Descent was 24 per 100,000 and 'other ethnic group' accounting for only 2 per 100,000 suicide rates [16]. This trend of suicide has decreased compared to the previous published study by Booth in 2014. Furthermore, this study by Booth in 2014 looked at suicide data from early 1970s which noted the highest rate in Fijians of Indian Descent of 34 per 100,000 rising to 57 for those between 15 and 24 years old. In these cases, hanging was the most commonly used method of suicide [17]. Poverty, being bullied, loneliness, cigarette smoking, and alcohol use were some of the associated factors

noted in a study done by Liu, 2018 [18]. While interpersonal loss, family loss or identity loss were major contributing factors noted by Booth 2014 [17]. A cross national study done in 2008 showed that depression, young age, low educational level and prior mental disorders were common precipitating factors [19]. Thus, suicide is a significant concern in Fiji. Most of the research, however, has been conducted in the adult population. To date no studies have looked at the prevalence rate or patterns of suicide in children in Fiji. This information is essential to inform an effective policy, service delivery and treatment response to reduce the personal, familial, and financial cost of suicide.

Fiji is classified as an upper middle-income Pacific Island Country by the World Bank [20]. It has a population size of 884,887 according to latest census done in 2017, 29% of this population comprises children less than 15 years of age. There was a total of 128,125 children aged 8-15 years living in Fiji, with 53,461 children in the same age group in Fiji Central Division only. Fiji consists of 322 islands, of which 110 are inhabited [21,22]. The two main islands in Fiji are Viti Levu and Vanua Levu with the main ethnicity groups being I-taukei and Fijians of Indian descent.

There are three divisional hospitals, Colonial War Memorial Hospital in Suva, and Lautoka Hospital on the main island of Viti Levu and Labasa hospital in Vanua Levu. There are 17 sub divisional hospitals, 80 health centers and 96 nursing stations situated across the nation with an increasing number of general practitioner's private clinics across the country [23]. The Central division of the Fiji Island includes the main city of Suva and nearby suburbs.

Referral of suicide or attempted suicide cases to the main divisional hospitals (CWMH, Lautoka, and Labasa Hospital) is as outlined in Figure 1.

Cases admitted under the Pediatric unit who had attempted suicide were referred for psychiatric evaluation and assessment as well as to Empower Pacific Fiji for counselling (located opposite the main CWM hospital). Empower Pacific is a non-governmental, non-profitable organization that is committed to providing free and confidential professional services including: counselling, social work, and capacity development, to all those in need [24]. Following discharge from the hospital when these children are considered fit to return to the community, they are then booked to the psychiatric clinic which operates on a monthly basis at the Children's outpatient department. This clinic is conducted by Psychiatrists or trainee Psychiatrists.

Suicide is a silent and growing concern in Fiji, on average there are 110 Fijians lost to suicide annually and it is estimated that for every completed suicide there are 20 attempts made in the community. Men are completing suicide more with an increased trend in the younger age group, with those in the age group 16-25 years being the most vulnerable. It is estimated that every 36 hours a Fijian attempts suicide [25].

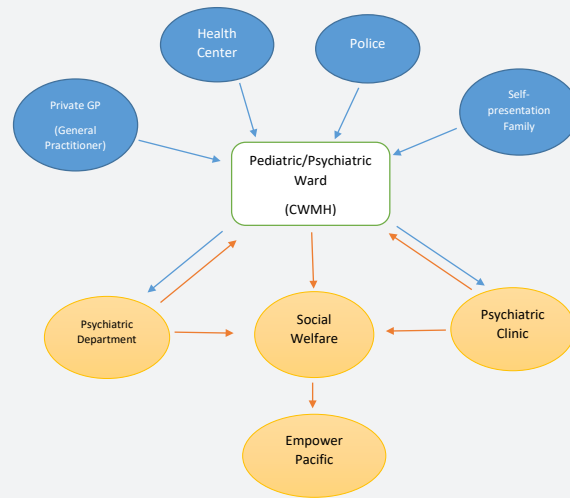


Figure 1: Referral system of suicide cases in Fiji Central Division.

In the main hospital of CWMH, more child suicide cases have been witnessed by clinical staff in the last few years and we continue to see a rise. Most children seen had chosen chemical poisoning as the form of suicide often precipitated by family conflicts. Despite having established systems in place to refer, investigate, treat, and follow up attempted suicide cases in children, there are still those who are missed out and fall through the gaps within the systems or lost to follow up. There are also limited studies on suicide in children and adolescents in the Pacific Island Countries including Fiji. Hence, this study was conducted in order to develop policy, service, and treatment responses to this escalating issue around child suicide.

Aim

The aim of the study was to determine the prevalence and patterns of attempted and completed suicide in children 8-15 years of age in the Central Division of Fiji in the past 5 years (January 2015 to December 2019).

Objectives

1. To determine the prevalence rate of attempted and completed suicide in Children 8-15 years of age in Fiji Central Division.
2. To determine the most commonly used method for suicide in children in Central Division of Fiji.
3. To determine the immediate precipitating factors or possible contributing factors for suicide in children in Fiji Central Division.
4. To determine fatality rate of suicide among children 8-15 years of age in Fiji Central Division.

Review of Literature

Childhood development is a crucial period where there are challenges faced physiologically and psychologically with changes in cognition, mental, emotional, and social behaviors. In pubertal and post pubertal period, there is a rapid growth and maturation of body and brain. These changes predispose children to mental health challenges or psychological stress which can be associated with increased risk of suicide. Research suggests that the understanding of the concept of suicide slowly develops by the age of 10 years [26]. There is evidence to suggest that most children understand both death and the concept of suicide by the age of 8 years, and many of them are capable of planning, attempting, and dying by suicide [27].

The World health Organization (WHO) European Region is facing increasing number of suicides each year, with low to middle income countries having the highest suicide rates [28]. Suicide mortality in the European Region is concentrated among the male population; 4 males for every female committed suicide in 2015 [28].

The global suicide rates among adolescents (15-19 years of age) extracted from the WHO mortality database is 7.4 per 100,000 populations [29]. Data is available in most developed countries, where attempted and completed suicides are a major problem. Suicide rate in the year 2000 was 8 per 100,000 in the United States, 15.3 in New Zealand and 8.9 in Australia in 2001 [29]. A community study done in Brazil an upper middle-income country showed a prevalence of 0.8% of deliberate self-harm cases [30]. Lifetime prevalence rate of suicide in Beirut was 0.7% with Taiwan rate of 0.75% and increasing rate for America and Puerto Rico from 3% to 5.9% [31]. A cross national study that looked at

17 countries in Europe showed a lifetime prevalence of suicidal attempts of 2.7 per 100,000 in 2008 [19]. The overall suicide rate for boys (10-14 years of age) has decreased from 1.61 to 1.52 per 100,000 populations with a slight increase for girls from 0.85 to 0.94 per 100,000 [32]. This increasing trend of suicide in the European Region was seen in a study done by Birt in 2003, where the mortality of suicide seemed to be decreasing, but the validity of the data is of concern as there were more cases of undetermined deaths recorded which may be due to suicide [33].

Pacific suicide rate is increasing accounting for 25% of global suicides and over 75% of all suicides in the Western Pacific Region occur in low- and middle-income countries [33,34]. New Zealand and Australia are also facing similar problems with increasing rate of suicide in children and adolescents. In a study done by Fergusson, evaluating the development of suicidal behavior in young people aged 15-21 years, showed that by age 21 years, 28.8% of children had already had suicidal ideas and about 7.5% have attempted suicide with an increased risk of suicide associated with younger age [35]. Suicide rate in Australia in 2007 was 8.9% in the general population, with the lowest suicide rate in young males aged 15-24 years, but this age group comprised 20% of the total fatalities by suicide [4].

A comparative study done by Booth in 2014, showed that there is increasing suicide rates since the early 1970s. Suicide rates are still increasing and shifting to younger age groups more commonly in males than in females. Suicide rate for Fijians of Indian descent was 34 per 100,000, rising to 57 for those between 15 and 24 years old [17]. Overall, the highest Pacific suicide rate was seen in Fijians of Indian Descent (1982-1983) and in Western Samoa (1981). Male rates are high by world standards, but female rates for Western Samoa and Fiji were higher [17].

Suicide risk factors varies according to the country, religion and beliefs, family background and community relations and as such, many factors involved in high income countries may not be seen in Low and middle-income countries. A study done by Bilsen in 2018, evaluating risk factors for suicide in youth indicate that multiple risk factors often play a role in the development of suicidal ideation and suicide attempts. Such factors include underlying mental disorder or pre-existent mental disorder (depression, personality disorder, and schizophrenia), previous suicide attempt, poor family support or history of suicide in the family, major life events such as interpersonal loss, young age and availability of means [36]. This was also similar in studies done by Nock 2008 and Weissman 1999 [19,31]. Socio-economic disadvantage, childhood physical and sexual abuse, poor parent-child attachment, parental changes, parental alcohol problems, parental illicit drug use and criminal behavior were the most common risk factors for suicide in studies done in New Zealand and Australia [4,35].

Suicide risk factors for Pacific Island countries include interpersonal loss, family loss or identity loss, poor family support,

with males being most affected by financial loss [17]. Lack of healthy coping mechanisms, religious beliefs and limitations, poor family support and lack of mental health seeking behaviors were contributing factors [37,38]. Culture, ethnicity, religion, marital status with marital problems, male gender are strong associated risk factors of suicide as well as prior mental illness [39].

Patterns of suicide differ in the different world regions and is greatly dependent on availability of means while other factors play a role as well such as beliefs, religion, commonality of suicide method. Globally, hanging was noted to be the most frequently used method of suicide and it was estimated that only around 20% of global suicides were due to pesticide self-poisoning. Firearms use was the most common method used in the United States and Europe as they have easy access as compared to Pacific Island countries. In rural Latin American countries, Asian countries, and Portugal, poisoning by pesticide was a major problem notably in women [40].

Hanging was also the most commonly used method of suicide in the European region with a higher rate of males (54.3%) than females (35.6%) followed by poisoning by drugs and use of firearms [41]. Similar findings were noted by Booth 2014, Fergusson in 2000 and Krysinska in 2012 where hanging was the most frequently used method of suicide [17,35,36]. Kposowa in 2006 stated that persons committing suicide at home were over 3 times more likely to hang themselves and over 2.5 times as likely to use firearms in an outdoor setting [42]. While suicide attempters use poisoning as a method of suicide, completers use hanging [43] which indicate that those completing suicide may have prior attempts or a clear plan of suicide which was often fatal.

Due to the stigma surrounding suicide, survivors may find it hard to seek support or talk about their feelings, while they are at higher risk of recurrent attempts. Families and communities are also significantly impacted when they lose a loved one to suicide which can snowball to a cluster of suicides within the community especially in teens or young adults. Rural communities often have a higher risk of suicide clusters given the tight knit nature of many towns or villages. According to the Centers of Disease Control and Prevention (CDC), suicide and suicide attempts cost society about \$70 billion in 2018 and the average cost of just one suicide is nearly \$1.5 million [44]. Similar figures were seen for average costs in the United States with a higher total cost of suicides and suicide attempts at \$9.3 billion [45]. The economic cost of youth suicide in Australia is estimated at \$21.97 billion a year in 2014 with direct costs accounting for \$2.98 million and indirect costs of \$21.94 billion [46].

These costs are categorized under direct costs which accounts for the services used by the individual leading up to and immediately following the suicide (unsubsidized GP visits, medications, counseling, funeral costs, and court costs, use of emergency services, insurance claims and medical services). Indirect costs to society include time lost from work and loss of

production, lost years of disability free life in addition to the pain and grief experienced by family, friends, and the community (46).

Although there are existing studies on suicide in the Pacific region and in Fiji, they were mainly focused on the general population (adolescents and adult) with no available statistics in the pediatric population. Therefore, the aim of this study was to determine the prevalence and patterns of attempted and completed suicide in children 8-15 years of age in Fiji Central Division.

Methodology

This study was a retrospective cross sectional descriptive and data linkage study on suicide (attempted and completed suicide) over a 5-year period from January 2015 to December 2019. It was carried out at the Colonial War Memorial Hospital, a tertiary and referral hospital for the Central and Eastern Division of Fiji. CMWH has 481 beds with specialist services in medical, surgical, pediatrics, obstetrics, and intensive care. Additional data was collected from the Police Forensic Crime Unit record books.

The targeted population was all children 8-15 years of age who have had a completed suicide or attempted suicide and either admitted at CWM hospital or seen as an outpatient, (Child and Adolescent or psychiatric clinic) and/or reported by the Police department. Fifteen years of age is the cut off age group for the Pediatric department at CWM hospital as those older than 15 years are admitted under internal medicine or the psychiatric department.

Inclusion criteria

Children 8-15 years of age:

- Those who have had a suicide attempt or completed suicide in the past 5 years (January 2015 to December 2019).
- Those who have been reported by the police during the study period with clear documentation of suicide as a cause of death.
- Those who were seen at St Giles Psychiatric clinic for attempted solitary or recurrent suicide attempts.
- Those who were found dead, clearly from suicide and were registered in the morgue record books during the study period.

Exclusion criteria

All children 8-15 years of age:

- Admitted at CWM hospital for accidental chemical or medication ingestion during the study period.
- Seen at St Giles Psychiatric hospital outpatient clinic for depression or mental disorder but hasn't had any suicide attempts but may have suicidal thoughts.

- Found dead with unknown cause of death, registered in the hospital morgue records.

- Children less than 8 years of age and older than 15 years of age.

The daily admission registers for Pediatric wards and ICU (PICU) used to help identify all the inpatients that were admitted to the respective wards. The folders of these patients were then retrieved, reviewed and those who fulfilled the inclusion criteria were recruited into the study.

Admission books for the stress ward were used to locate patients that met the inclusion criteria but did not go through the pediatric or the police departments. Records of cases seen at the psychiatric clinic at the children's outpatient department and adolescent's clinic who met the inclusion criteria were also included in this study.

The police records from the forensic crime statistics unit were accessed and reviewed, and children that met the inclusion criteria were cross checked with the names and date of birth for those retrieved from the children's wards, PICU, stress ward, and psychiatric clinic to prevent duplication of data. The names and other characteristics were recorded in the data extraction form in Appendix 1. All these cases were then assigned an individual code number to de-identify them.

Morgue records could not be accessed as completed suicide cases are under the police forensic unit with limited information on autopsy. Immediate cause of death was the only information listed which would not have added context to this study.

Variables of interest include age, gender, school level (Class), method of suicide, first or recurrent episode, underlying psychological distress or mental disorder, precipitating factors, and outcome were listed on a de-identified data collection sheet in Appendix 2, and transcribed to Microsoft Excel Sheets.

Electronic copies of data were stored on a password-protected computer. Hard copies of data sheet were kept in a locker accessible only to the researcher. Data was only shared with supervisors and statistician through secure channels.

Quantitative data were entered into an excel spread sheet to get simple descriptive statistics and cross tabulations. Analysis was done to satisfy the objectives by calculating the prevalence rate and case fatality rate. The prevalence rate was calculated using the total number of cases of attempted and completed suicide in the study period over the total number of children in the study age group living in Fiji's Central Division (53,461 children) per 100,000. The number of children used to calculate the prevalence rate was achieved from the Fiji Bureau of Statistics from the 2017 census data set. Fatality rate of suicide was calculated using the number of completed suicide cases over the total number of suicides (attempted and completed suicides - 47 cases) multiplied by 100 to get the percentage.

Data were tabulated using Microsoft Excel 2013 version and statistical analysis was performed using SPSS. Data linkage was carried out by comparing the patient's information from the police record and admission folders and names from psychiatric clinic, to look for these identifiers: name, date of birth, address, precipitating factors, with suicide method and outcome. This helped in identifying and matching the variables of cases admitted in the hospitals with those from the police records to be assured that it is the same person and thus recorded as such.

In order to get a study power of >80%, a total of 150 participants were needed to be recruited in this study. A sample size of 47 participants gives this study, a power of 30% as the study was carried out only in the Central Division and due partially also to the national COVID 19 pandemic movement restrictions.

Ethics approval was sought from the Fiji National University (FNU), College of Medicine, Nursing and Health Sciences- College Health Research Ethics Committee (CMNHS-CHREC), the Fiji Ministry of Health Research and Ethics Committee and permission

from the CWMH and Police headquarters before data was collected.

All information accessed from the patients' folders were kept confidential. Collection was on a de-identified data collection sheet. Identifying patient information with corresponding patient code was only accessible to the primary investigator.

Informed, written and voluntary consent was not required as only patient's records and folders were accessed with no contact with the patients, patient's parents, or guardians and this was endorsed by CHREC.

Results

Table 1 describes demographic descriptions of both attempted and completed suicide cases with the method of suicide used. Majority of suicide attempts were Fijian of Indian descent females while males have higher number of completed suicide with fair distribution between the main two ethnicities. 64% of the cases were within the age group of 14-15 years with the youngest child completing suicide at 9 years of age.

Table 1: Description of attempted and completed suicide cases with methods of suicide.

| Age Groups | Attempted Suicide | | | | | | Completed Suicide | | | | | | Method of Suicide | | | | | | | | | | | | | | | |
|-------------|-------------------|----------|-----------|------|----------|--------|-------------------|--------|-----------|----------|---|----|-------------------|-----|-----------|-----|-----------------|----|-------|---|---|-----|----|----|---|-----|----|----|
| | Gender | | Ethnicity | | | | Gender | | Ethnicity | | | | Hanging | | Poisoning | | Self-Mutilation | | Total | | | | | | | | | |
| | Male n | Female n | FOID n | IT n | Others n | Male n | Female n | FOID n | IT n | Others n | n | % | n | % | n | % | n | % | | | | | | | | | | |
| 8-9 Years | - | - | - | - | - | - | 1 | 2 | 1 | 2 | - | - | - | - | 1 | 2 | - | - | - | - | 1 | 2 | | | | | | |
| 10-11 years | 1 | 2 | - | - | - | 1 | 2 | 3 | 6.4 | 1 | 2 | 3 | 6.4 | 1 | 2 | 6 | 13 | - | - | - | - | 6 | 13 | | | | | |
| 12-13 years | 3 | 6.4 | 3 | 6.4 | 3 | 6.4 | 3 | 6.4 | - | - | 2 | 4 | 2 | 4 | 3 | 6.4 | 1 | 2 | - | - | 4 | 8.5 | 6 | 13 | - | - | 10 | 21 |
| 14-15years | 5 | 11 | 14 | 30 | 16 | 34 | 2 | 4 | 1 | 2 | 7 | 15 | 4 | 8.5 | 5 | 11 | 6 | 13 | - | - | 4 | 8.5 | 23 | 49 | 3 | 6.4 | 30 | 64 |

Patterns of Suicide

| Types of chemical/substance used (Poisoning) | Number of cases (n=30) | |
|--|------------------------|--------|
| | Male | Female |
| Paraquat | 7 | 3 |
| Janola | 0 | 3 |
| Premix | 0 | 1 |
| Tablet/Medicine | 3 | 8 |
| Tile Cleaner | 0 | 1 |
| Silica gel Crystals | 0 | 1 |
| Organophosphate | 1 | 0 |
| Bed bug chemical | 0 | 1 |
| Unknown | 1 | 0 |

Patients Recruitment

During the study period 1st January 2015 to 31st December 2019, there was a total of 56 patients that met the inclusion criteria. Four folders could not be located from the stress ward

and children’s wards. The other 5 cases excluded from the study did not meet the age group criteria. A total of 9 patients were excluded from the study.

A total of 47 patients were included in the study Figure 2.

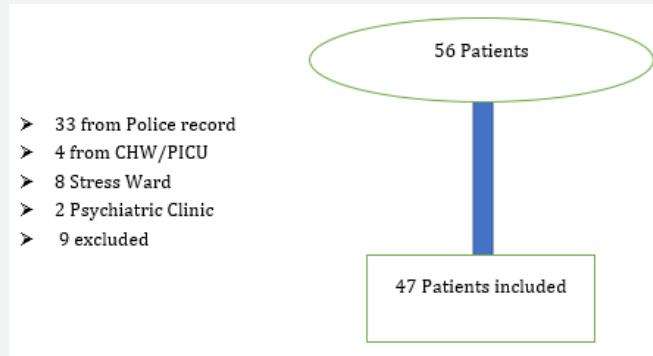


Figure 2: Patients recruitment.

Prevalence rate of Attempted and Completed Suicide in Children aged 8-15 years in Fiji Central Division Figure 3

In the present study, the 5-year prevalence rate of suicide attempts was 39.2 per 100,000 with a higher rate of completed

suicide of 48.6 per 100,000. 2015 had the highest rate of completed suicide with a decline through 2016-2018 and again a rise in 2019. Although there was a low completed suicide rate throughout 2016-2018 there was a higher rate of attempted suicide cases with a rate of 13 per 100,000 and a completed suicide rate of 9.3 per 100,000 by 2019.

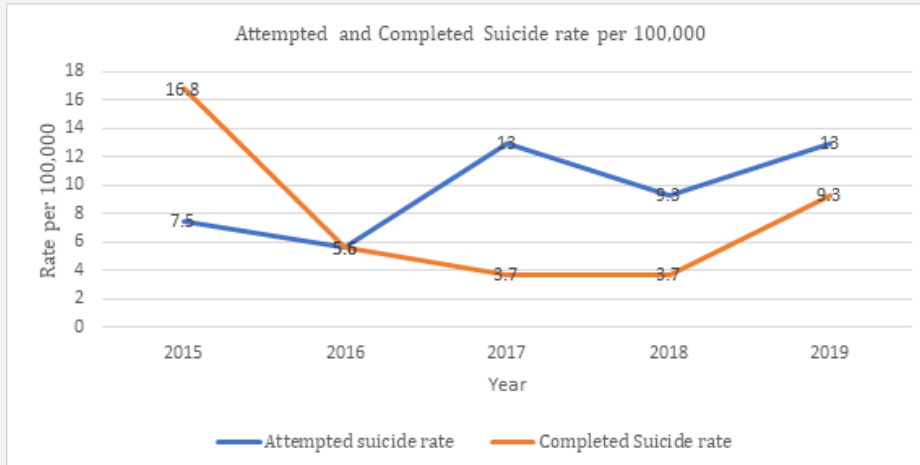


Figure 3: Prevalence rate of Suicide per year.

Gender distribution for Attempted and Completed Suicide cases per year Figure 4

There was a peak in the number of attempted suicides in 2017 to 2019, with a higher proportion of the cases being females. In 2019, females had the highest number of both attempted and completed suicide.

Ethnicity distribution of Attempted and Completed Suicide Figure 5

The majority (62%) of the children who had attempted suicide during the study period were Fijian of Indian Descent in the age group 8-15 years, while the Itaukei group accounted for only 34% of the cases with 4% of other ethnicity group. Figure 6 (Patterns of Suicide).

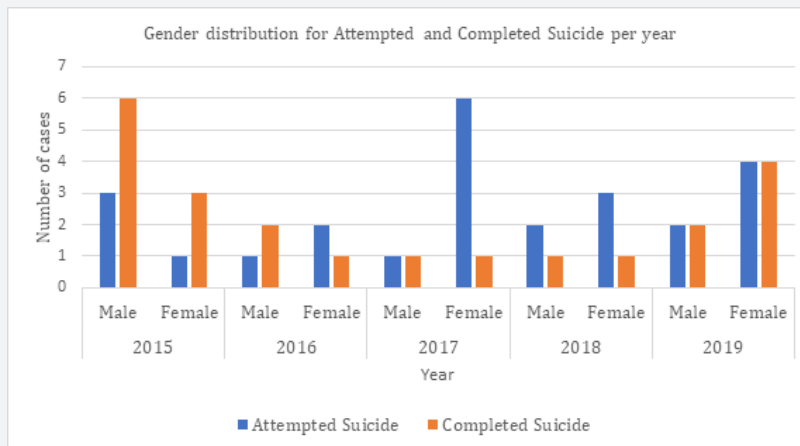


Figure 4: Distribution of gender per year.

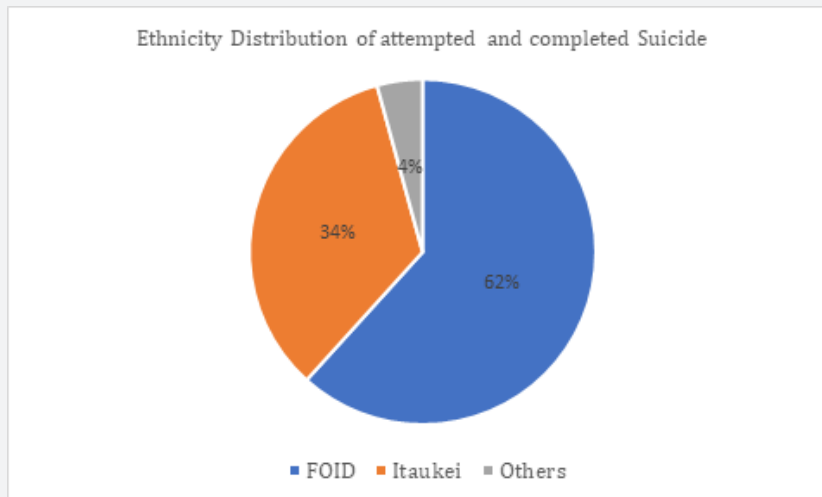


Figure 5: Ethnicity distribution of attempted and completed suicide.

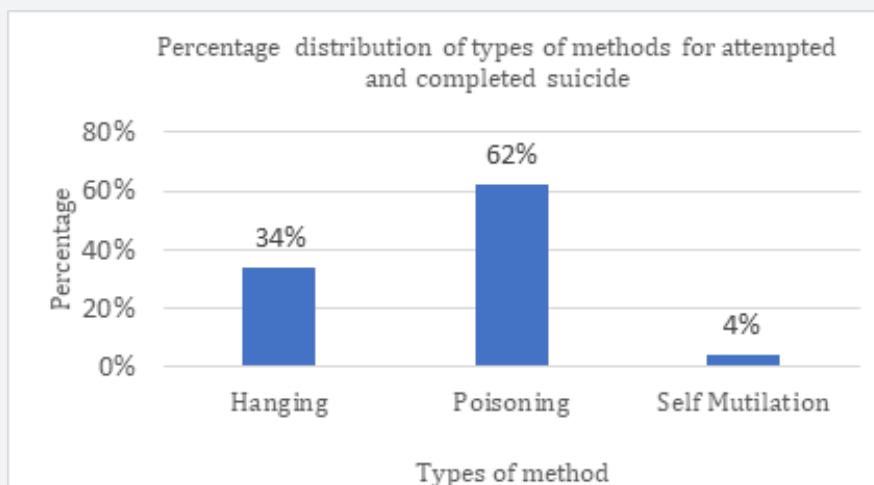


Figure 6: Percentage distribution of different types of methods used in suicide.

The most commonly used method of suicide in this study was poisoning (62%), followed by hanging (34%), with only 4% of the cases using self-mutilation to commit suicide. It was noted that self-mutilation is a non-suicidal self-injurious act, but in these particular cases who were admitted in the children/psychiatric (stress) ward, they clearly indicated that their self-injurious act was intended to result in death, hence inclusion

in the study. Distribution of the types of chemicals/substances used in poisoning were further elaborated in the table provided. The majority of the cases, predominantly females used tablets/medicines while paraquat ingestion was used more commonly by males. Hanging only accounted for 34% of the cases but had a higher mortality rate of 80% as compared to other modalities of committing suicide.

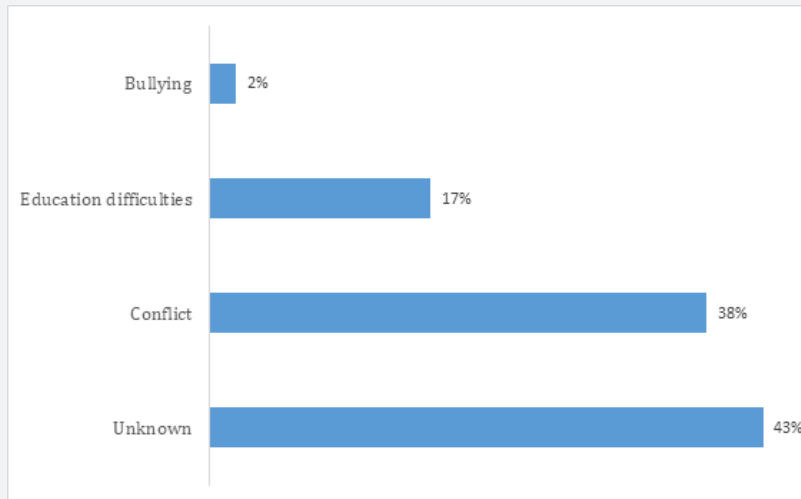


Figure 7: Percentage distribution of immediate precipitating factors of suicide.

The largest percentage (43%) of cases were listed under unknown immediate precipitating factors, followed by conflict which accounted for 38% of cases. The precipitating factors were listed as “Not Known” in the police reports. Conflicts include

relationship discord with parents, family members, friends, boyfriend, and girlfriend while educational difficulties (17%) mainly included failure of exams, or fear of failure of exams/tests. Only 2% was accounted for by bullying.

Fatality Rate of Suicide Figure 8

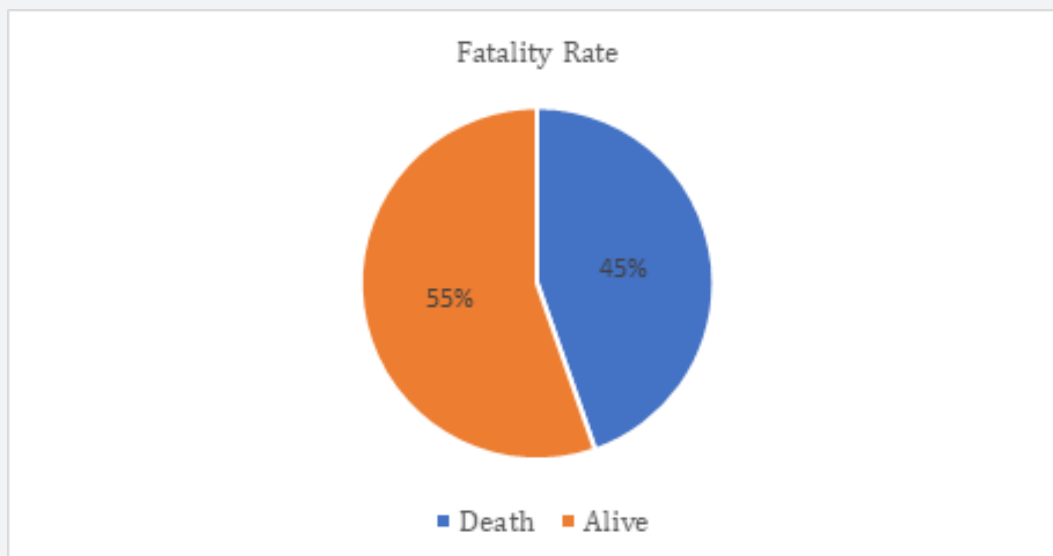


Figure 8: Fatality rate of suicide.

Fatality rate of suicide in children aged 8-15 years in Fiji Central Division was 45% Table 2.

Table 2: Completed suicide in relation to age, ethnicity and methods of suicide.

| Characteristics | Alive n = 26 | Dead n = 21 | OR | p-value |
|--|------------------------|------------------------|------|---------|
| AGE (Advancing age + Completed Suicide) | Mean 13.8 (SD 1.25) | Mean 12.9 (SD 1.65) | 0.63 | 0.038 |
| Ethnicity (FOID vs non FOID) | | | 0.33 | 0.078 |
| FOID | 19 | 10 | | |
| IT | 6 | 11 | | |
| Others | 1 | 0 | | |
| Method (Hanging vs Other methods of Suicide) | | | 10.2 | 0.002 |
| Hanging | 3 | 12 | | |
| Poisoning | 20 | 9 | | |
| Self-Mutilation | 3 | 0 | | |

Increasing age was associated with reduced odds of dying, as younger children completed suicide more (OR 0.63, $p < 0.038$). The majority of children attempting suicide were Fijians of Indian Descent with only 34% completing suicide, while 63% of the Itaukei children who attempted suicide died. There was a significant relationship between completed suicide and hanging (OR 10.2, $p < 0.002$).

Discussion

In the present study, the 5-year prevalence rate of suicide attempts was 39.2 per 100,000 with a higher rate of completed suicide rate of 48.6 per 100,000. The highest rate of completed suicide was seen in 2015 (16.8 per 100,000) whereas the rate in 2019 declined to 9.3 per 100,000. Despite the low completed suicide rate in 2019 it was noted that suicide attempts increased from 9.3 in 2018 to 13 per 100,000 in 2019. The reasons for a high suicide rate in 2015 were not explainable; this could be attributed to proper recording of cases. The fall in suicide rate from 2016 to 2017 could have been due to the establishment of Fiji Child Helpline in 2015 which provided continuous support seven days a week for the children in need [25]. It was reported by the police that the use of marijuana and methamphetamine in school children peaked in 2019 which may have predisposed these children to suicidal behavior during that year. The high rate of suicide attempts and completed suicide in 2019 could also be a result of better classifications and reporting of these cases.

Suicide attempt was more common in adolescent females (14-15 years) accounting for 14.9% in 2019, which was higher than the prevalence of suicide attempts among adults in developing countries (0.3%) based on the WHO World Mental Health Surveys [47]. Although this rate is slightly lower than suicide attempts among adolescents in low- and middle-income countries (17.4%) in a study done by Liu in 2014 [18]. The completed suicide rate for

children aged 8-15 years in the Fiji Central Division was slightly lower (9.3 per 100,000 in 2019) than WHO suicide prevalence rate in 2016 which was 10.5 per 100,000. Overall, there was a higher number of females attempting suicide while males are completing suicide more. A finding which was also similar in the studies by Fergusson in 2000, Lewinsohn in 2001, and Kokkevi in 2012 [35,48,49].

Fijians of Indian Descent predominate for suicide attempts (62%) whereas only 34% of the cases were of Itaukei ethnicity with 4% of other ethnic group. This was also similar in the study done by Booth in 2014 where the majority of suicide cases were Fijian of Indian Descent with predominance in the female gender [17]. Although Fijians of Indian descent have the higher number of suicidal attempts, they were less likely to complete suicide as compared to the Itaukei children (OR 0.33, $p < 0.078$) which could mean that the Itaukei children were more determined to successfully complete suicide than the Fijians of Indian descent children.

Poisoning was seen as the most frequently used method of suicide in this study whereas a previous study done by Booth, 2014 showed that hanging was the most commonly used method [17]. Globally, hanging is the most frequently used method of suicide followed by poisoning and use of firearm in developed countries [40]. This was also similar in the studies done by Fergusson in New Zealand, Krysinska in Australia and Varnik in Europe [35,36,41].

When comparing the methods of suicide attempts and gender in this study, females were more likely to choose a less lethal method of suicide as compared to males in which 60% of the cases that used poisoning as a method of suicide were females with a higher percentage (36%) for use of tablets/medicine. There might be underlying psychological differences that were more likely to affect female adolescents than males, and these need to be further evaluated. The majority of Itaukei male children used hanging as

a method of suicide (73%) while 80% of Fijian of Indian descent children chose poisoning. Although there were fewer children that chose hanging as a method of suicide, the mortality rate is higher (80%) as compared to poisoning or other methods (OR 10.2, $p < 0.002$). There has been an increasing number of poisonings by chemical/medicines in the past years in Fiji which had led the government to initiate the applaudable ban of paraquat and imidacloprid pesticide since 1st January 2020 [50].

In our study we found that conflict - 38% (relationship discord with family, friends, boyfriend, and girlfriend), educational difficulties - 17% (failure of exams or fear of failure of exams), bullying - 2%, precipitated suicide in 57% of children. Liu in 2018 described associated factors of suicide as poverty, being bullied, loneliness, cigarette smoking and alcohol use [18]. Interpersonal loss, family loss and identity loss were major contributing factors stated by Booth in 2014 [17] while a cross national study done in 2008 noted that depression, young age, low educational level, and prior mental disorder were contributing factors for suicide [19]. Determinants of suicide in the Pacific Island countries are culture and ethnicity, religion, marital status/problems, male gender, and prior mental health illnesses [39]. To note, a large proportion of the cases included in this study were listed under unknown immediate precipitating factors or contributing factors prior to suicide attempts which accounted for 43% of the cases. This may be because the precipitating factors in these cases were not clear or were simply not known to the family and hence, a classification of "Not Known" was recorded in the police records. Immediate precipitating factors or major life events that preceded suicidal behavior differed for each country as well as methods of suicide, based on socio economic status, religion, cultural beliefs and overall accessibility and availability to modalities to commit suicide at that point in time.

The fatality rate in this study was much higher (45%) as compared to the previously published study in 2014 by Booth which was 37-39% [17]. It was noted that children in the younger age group < 13 years chose a more lethal method of suicide (hanging), as shown in Table 1. The youngest child to complete suicide in this study was a 9 years old Fijian of Indian Descent female, who also used hanging as a method of suicide. The majority of suicide attempts were in the older age group 14-15 years with a higher number of females attempting suicide and higher number of males completing suicide.

CONCLUSION

The high rate of attempted and completed suicide in Fiji Central Division for children aged 8-15 years is a major concern that needs to be addressed. This is merely the tip of the iceberg as underreporting and poor documentation leads to underestimation of the gravity of the situation.

The issues of suicide must be addressed comprehensively by multi sectorial organizations (Police, Social Welfare, Schools, Hospital services, etc) to tackle and put in place protective measures to deter these young children from committing suicide.

Moreover, the Ministry of Health has put in place national policies to combat suicide in Fiji such as the mental health decree and legislation for Fiji, national mental health and suicide prevention plan, and national suicide prevention policy [51,52]. The mental health decree and legislation for Fiji (2010) focuses on consumer rights, treatment in the least restrictive environment; further development and strengthening of community mental health care; mental health promotion and reducing stigma associated with mental health. Existing national mental health and suicide prevention plans, and the national suicide prevention policy in Fiji can be further strengthened by the results and recommendations from this study. Having existing national policies in place is a stepping stone forward in the continued struggle against mental health illnesses and premature deaths associated with mental health. Thus, such actions make way for additional recommendations and policies to be considered and implemented.

Limitations Of the Study

This was a retrospective study. It was difficult to classify some of the cases due to poor documentation and improper classifications mostly for precipitating factors and outcomes of cases.

Completed suicide cases are taken under the Police forensic unit and autopsy only showed the immediate cause of death such as asphyxiation secondary to hanging, or from poisoning with limited other information which would have added context to this study.

The current study fell short in sample size and desired power, hence we could not generate statistically significant results or conclusions to establish increased "attempted and completed suicide" in the study group. It can be explained by the fact that the study period was limited, hence the inadequate number, relatively a smaller number of attempted and completed suicide in children between 8-15 years, as compared to general population at large. However, it does throw a very definite indication of the increasing trend of suicide amongst the age group needs to be addressed appropriately and effectively.

Recommendations

Results of this study will be presented to the police crime forensic unit, Ministry of Health, and Ministry for Women, Children & Poverty Alleviation to strengthen existing policies, and coordination between these sectors. Results and recommendations will also be forwarded to the Fiji National Committee for the Prevention of Suicide (NCOPS) to inform the national policy on suicide prevention. Existing national mental health and suicide prevention plan, and national suicide prevention policy in Fiji can somewhat be further strengthened by results and recommendations from this study. Furthermore, enforcement of the use of child safety medicine containers is needed to be made a national policy to prevent children unsafely accessing such medications at home.

All those children who have attempted suicide, should be under supported surveillance in their homes, schools, with regular monitoring and follow up in the children outpatient and psychiatric clinics. There should be a stronger coordination between the police forensic crime unit and hospital services to help identify those children who have attempted suicide so they can be on strict monitoring and follow up to prevent further attempts. Stress management units should be developed in the schools, with psychological counselors on rolls to screen and identify children who are at higher risk or those who are struggling with mental health illnesses. Specialized training should be made mandatory to teachers to identify such children who are or can be at risk.

Better documentation and classification of these cases needed to be done. Revision of the police suicide data collection form is recommended; they must lay more emphasis on methods of

suicide, past details of suicidal behavior of the child and detailed enquiry should be made to identify the precise precipitating factors that led to the event of the suicide.

The regular psychiatric clinic needs to be strengthened to identify at high-risk cases so they can be closely monitored with regular visits or home visits. There is also a need for more pediatric psychologists who should be providing support services not only in the hospitals but also to the schools.

Further larger, sampled prospective nationwide studies are required in Fiji to provide psychological autopsy and robust data to assist health officials to formulate effective policies to reduce suicide prevalence in children (Appendix 1 & 2). Finally the authors acknowledge the contribution of all sectors involved in the various primarily owned data collection tools availability and in inferred conclusions of this study.

Appendix 1:

Participant Study Code:

Name:

DOB (Age):

Address:

Site: _____

Socio-demographic Information:

| | | |
|-----------|--|--|
| Gender | Male | Female |
| Ethnicity | I-Taukei Fijian of Indian descent | Others |
| Religion | Roman Catholic Jehovah's witness Hindu Islam Buddhism Anglican church | SDA LDS Orthodox Church Baha'i Church of God Others |

Education:

| | | |
|-----------|----------|-----|
| Primary | 3-4 | 5-6 |
| Secondary | Form 1-2 | 3-4 |

Predisposing Factors/ Triggers:

| | | | |
|----------------|--|--|---|
| Individual | Previous suicide attempt Mental d/o Harmful use of alcohol | Financial loss Hopelessness Chronic pain Bullying | Family history of suicide Genetic and biological factors Education difficulties |
| Relationships | Sense of isolation and lack of social support | Relationship conflict/ discord or loss | Abuse |
| Community | Disaster war and conflict | Stresses of acculturation and dislocation | Discrimination Trauma/ Abuse |
| Society | Access to means | Inappropriate media reporting | Stigma associated with help seeking behavior |
| Health Systems | Barriers to accessing health care | undetermined | Others |

Suicide Methods:

| | | |
|--|---|--|
| Poisoning Hanging Strangulation Jumping from height | Use of firearm Self-mutilation Drowning Electrocutions | Fire/Burn Starvation Suffocation Vehicular impact |
|--|---|--|

Outcome:

Alive Dead__

**This data extraction form was partially extracted from WHO, Preventing Suicide, A Global Imperative article www.who.int/mental_health/suicide-prevention/world_report_2014/en/*

Appendix 2

| CODE | AGE | GENDER | ETHNICITY | METHOD OF SUICIDE | FIRST OR RECURRENT ATTEMPT | UNDERLYING MENTAL DISORDER | PRECIPITATING FACTOR | OUTCOME |
|------|-----|--------|-----------|-------------------|----------------------------|----------------------------|----------------------|---------|
| | | | | | | | | |
| | | | | | | | | |
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