

## Characteristics and Management of Parasuicides at a Tertiary Hospital in Gaborone: A Retrospective Study at the Emergency Department of Princess Marina Hospital

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### Abstract

*Parasuicide has become one of the major public health problems worldwide. The WHO is estimated that for every suicide that occurs worldwide, there are up to 20 suicide attempts; however reliable data are not available for most countries. Furthermore, much less is known about attempted suicide across the African continent. Therefore, it was opportune to conduct such project which will provide some valuable statistics on Parasuicide in Botswana. The major objective is to establish the characteristics of Parasuicide at the Princess Marina hospital. Therefore, a retrospective descriptive design (188 patients with Parasuicide) was conducted at the emergency room (January - December 2015). The prevalence of parasuicide is estimated at 0.88%. Overall, females are predominant (79.7%). The age group 21-30 is predominant, mostly students. The factors influencing parasuicide are passionate conflict (30.8%), family conflict (20.7%), and social problems (7.9%). Toxic agents (88.2%) were largely used, mostly by females. Among the toxic agents, pharmaceuticals (68.62%) and chemicals (17.55%) were predominant. The overall outcome is largely good (98%). Although patients were widely managed by internal medicine (75.53%), a multidisciplinary approach was established in 10.64% of cases. The study demonstrates that there was no correlation between waiting time, the code of severity and the outcome, as well as the deranged blood and the outcome. In conclusion, Characteristics, and management of Parasuicide were studied. The findings are above described. Further studies may be necessary to elaborate different parameters of parasuicide.*

**Keywords:** *Characteristics of parasuicide, Management of parasuicide, Parasuicide, Princess Marina Hospital.*

### Introduction

Parasuicide has become one of the major public health problems worldwide [1, 2]. Despite the limited number of studies conducted in Botswana on this topic, Parasuicide has been shown to be a public health problem (princess marina hospital record, 2014).

Studies around the world have mainly focused on suicide though they have a

parasuicide component. Globally, suicide represents a significant and complex public health problem. It is estimated that over a million suicides occur every year. The real figure is believed to be higher than this estimate due to underreporting in many parts of the world.

Similarly, the estimated number of non-fatal self-inflicted injuries (parasuicide) is twenty times higher than the number of reported deaths due to suicide [3].

In Botswana, suicide cases have been reported as well. A study was conducted in two urban and two rural areas. This study attempted to highlight factors associated with suicide. The sample size was 100 participants. In this study, the factors associated with suicide and suicide attempt were mental illness (31%) and alcohol abuse (69%).

Similarly, out of 100 study participants, 45 were attempters (parasuicide) and 55 were completers (suicide). Likewise, 78% were male and 22% were female. Based on the sociodemographic factors, the study also found that, on one hand, women are more suicide attempters than men, and on the other hand, men are more suicide completers than female. In both males and females, complete suicides were more likely above the age of 20 [4].

Of the cases attended at the accident and emergency in princess marina hospital, about 2% are parasuicide. Yet no study has been conducted. Hence the need for this study.

The purpose of this study is to determine the patterns and characteristics of parasuicide tendencies in patients presenting at the accident and emergency department of the Princess Marina Hospital.

Each year, the World Health Organization (WHO) estimates that almost a million people die from suicide worldwide, highlighting suicide as a serious global public health concern.

It is estimated that for every suicide that occurs worldwide, there are up to 20 suicide attempts; however reliable data are not available for most countries. Furthermore, much less is known about attempted suicide across the African continent [5].

Although there is limited data in most African countries in general and in Botswana in particular, there are data suggesting that parasuicide is a significant problem in Botswana. Some estimates show that over 30% of adolescent admissions to the referral hospital are due to parasuicide (Paul Sonenthal, 2010).

In a pilot study conducted at the accident and emergency department of the Princess Marina hospital from the 20<sup>th</sup> to 27<sup>th</sup> November 2016, 8861 patients were seen. Of these, 144 (1.6%) were parasuicide patients. Furthermore, 60% of these parasuicide patients were female with the majority being adolescents (15 – 25 yrs). It was also found that most agents used in parasuicide were medications (over the counter drugs or daily drugs for chronic disease). The most prevalent risk factor for parasuicide was found to be social conflict (partnership and family issues) (princess marina hospital medical record, 2016).

Based on this finding, it is opportune to conduct a study which will provide some valuable statistics. These statistics will provide preliminary data for future research on parasuicide.

There is a dearth of knowledge with respect to parasuicide first in Africa in general and second in Botswana in particular. However, there is increasing evidence of parasuicide events in different hospitals in Botswana [3, 6]. Hence this study is conducted to fill the existing gap regarding knowledge of parasuicide in Botswana.

The aim of this study is to determine the characteristics of parasuicide based on the patients who attended the accident and emergency department at the Princess Marina hospital.

1. To describe the epidemiological patterns of parasuicide at princess marina hospital.
2. To describe different agents or methods involved in parasuicide.
3. To establish the level of urgency of parasuicide at princess marina hospital and its impact on the management of this condition.
4. To determine the outcome following a parasuicide.

## **Research Design and Methodology**

### **Study Setting**

The study was conducted at the accident and emergency (A&E) of Princess Marina hospital. Princess Marina Hospital is one of the two public, referral hospitals catering for the entire southern part of the Country. Princess Marina hospital is situated in Gaborone, the capital city of the Republic of Botswana.

The accident and emergency department is one of the units of the Hospital. It is the major entrance to the hospital. It is situated by the entrance of the hospital with an emergency gate, opposite the transport office for ambulances. The accident and emergency department is divided into different sections and offices including Head of department office, Triage room, Patient Waiting area, Family waiting area, Bays (1 to 10) and corridors (1 to 7), Resuscitation room, Side laboratory, Kitchen, Sister in charge office, Storeroom, Disaster room, Doctors station, Nurse's station, Health care auxiliary's station, Isolation room.

The Accident and emergency department has the mandate to manage and stabilize efficiently and effectively trauma and critically ill patients. During 2015, about 28000 patients attended accidents and emergencies for various reasons. The patients are either referred from different health facilities or self-referred from home.

### **Study Population and Duration**

All patients who attended the accident and emergency department between 1 January 2015 and 31 December 2015, with the history of parasuicide and/or drug overdose in the background of attempted suicide were eligible to be enrolled in the study. Below are the inclusion and exclusion criteria.

### **Inclusion Criteria**

1. Patients who attended accident and emergency department at princess marina hospital.

2. Patients with a diagnosis of parasuicide on admission at the Emergency Department from January to December 2015.
3. Patients with an initial diagnosis of drug overdose with a history of attempted suicide will be included in the study.

### **Exclusion Criteria**

1. Patients from other hospitals.
2. Patients with known psychotic conditions (e.g., bipolar disorder).
3. Any unclear record (s).
4. Any record (s) with missing data.
5. Any record (s) without the hospital record number (PM/PA)

### **Study Design**

This is a retrospective descriptive study of medical record of parasuicide patients at princess marina hospital over a one year period covering January 2015 to December 2015. A retrospective study is defined as a research design that is used to test etiologic hypotheses in which inferences about exposure to the putative causal factors are derived from data relating to characteristics of persons under study or to events or experiences in their past [7].

The retrospective design has multiple advantages including, but not limited to, less expensive and less time to complete than other designs yet yielding equally important information. It has a disadvantage of generating biases (selection bias, recall bias, misclassification, and information bias).

### **Sampling Method**

A simple random sampling was performed. A random sample is one which is arrived at by selecting sample units such that each possible unit has a fixed and determinate probability of selection [7].

The investigator looked at records of patients who attended the accident and emergency department of princess marina hospital. Following that, all records of patients with

parasuicide and/or drug overdose with the background of suicidal attempt were identified.

### **Sample Size, Statistical Power, and Level of Significance**

Taking into account that type I error is estimated at 5% (P value) and type II error is estimated at 80%, with a standard deviation at 5.6 (M. A. Suleiman & al, 1986); the sample size in our study is 188.

The sample above was calculated based on the following formula.

$$\text{Sample Size} = \frac{(Z_{1-\alpha/2})^2 \times S^2}{d^2}$$

$Z_{1-\alpha/2}$  represents the standard normal variation (at 5% type 1 error with P value less 0.05). It is equal to 1.96.

SD stands for standard deviation. Estimation from a previous study done in Kuwait.

d is the absolute error or precision representing the power of the study.

### **Assessment and Measurements**

The following variables were included in the study:

1. Sociodemographic factors (age, gender, occupation, marital status, employment, student, relationship problems).
2. Medical intervention at A&E (medication and investigation, dispatch, referral, further management).
3. Method of parasuicide (toxic agents, others).
4. Outcome attributes (presence or occurrence of complications).

### **Data Collection and Statistical Analysis**

#### **Data Extraction**

Data extraction has been conducted by the investigator using a Microsoft excel spreadsheet. The data extraction started by physical search of the triage form of parasuicide cases over the 1 year period. A total of 247 patients had a diagnosis of parasuicide; out of which, 23 were discarded due to lack of adequate information (14 missing medical

record number, 2 with wrong medical record number, 6 known psychiatric patients, 1 missing gender and age). The remaining 224 cases were all eligible to be enrolled as participant into the study. Each participant was given a number from 1 to 224. Random number generators were used to come up with the required sample size of 188. Upon identification of the 188 patients (sample size), the PA/PM number of the selected patients were used to trace the blood results of these patients in the IPMS.

### **Data Analysis**

#### **Descriptive Analysis**

The distribution of each variable was examined and presented in tabular form and graphs followed by statistical analysis. Measures of central tendency (mean, median and mode) and measures of spread (range, interquartile range, and standard deviation) were studied to explore the socio-demographic and clinical characteristics of patients, the methods used to commit parasuicide as well as the outcome. The record and analysis of the data were done using SPSS 16.

#### **Inferential Analysis**

Inferential statistics were used to establish the relationship between variables in the data sets including but not limited to, the relationship between age and triggering factors, gender and triggering factors or gender and method used for parasuicide.

#### **Ethical Considerations**

The purpose of these ethical considerations is to promote the aims of research such as knowledge, truth, and avoidance of errors as well as a variety of other important moral and social values, such as social responsibility and human rights.

Due to its retrospective nature, this descriptive study will not directly enroll any human subject. To ensure the confidentiality,

some measures were taken into considerations as follows:

1. Data were coded, kept anonymous and used only for research purposes.
2. No patients were directly in contact with the principal investigator and the research team.
3. Data were kept in a secure and locked computer held only by the principal investigator. Only the research team had access to the file on the computer.

4. At the end of the data analysis and interpretation, the primary tool of data collection was deleted from the system.

### Observations and Findings of The Study

The accident and emergency department of princess marina hospital admitted a total of 28000 patients in 2015, among which 247 was diagnosed with parasuicide. This represented 0.88% of patients who attended the ED. Only 188 patients were eligible and enrolled in the study. Following are different findings of the study.

**Table 1.** Showing Gender Distribution among Parasuicide Cases Registered at the Accident and Emergency of PMH Of the Study Population, 79.79% of patients were Females while Males Represent 20.21%

Gender	Freq.	Percent	Cum.
1	150	79.79	79.79
2	38	20.21	100.00
Total	188	100.00	-

Legend: 1: female; 2: male

In the study population, almost half of the patients were between 20 and 30 years old (46.81%), followed by 36.17% of teenager. The tendency of parasuicide decreases as the

population is getting older. However, only 0.53% attempted suicide amongst the age groups of 51-60 years and 61-70years old.

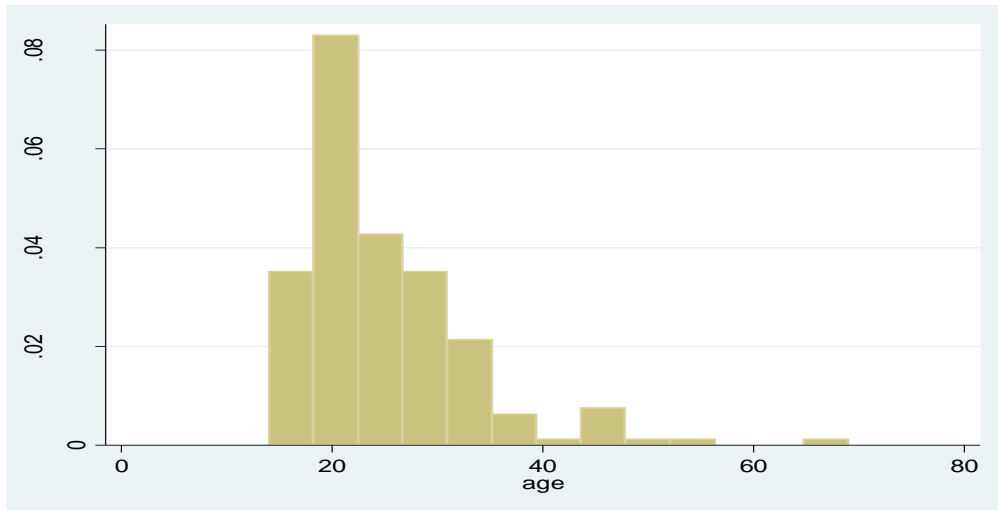
**Table 2.** Showing Age Distribution among Parasuicide Cases Registered at the A&E of PMH

Agecat2	Freq.	Percent	Cum.
20	68	36.17	36.17
30	88	46.81	82.98
40	23	12.23	95.21
50	7	3.72	98.94
60	1	0.53	99.47
70	1	0.53	100.00
Total	188	100.00	-

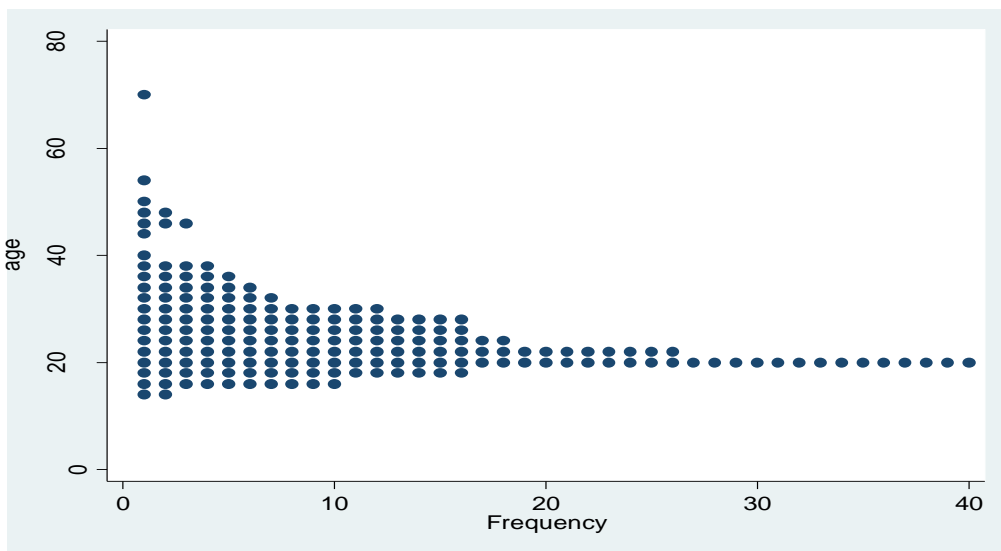
Legend: age group; 20: < or = 20 years; 30: 21 – 30 years; 40: 31 – 40 years; 50: 41 – 50 years; 60: 51 – 60 years; 70: 61 – 70 years

The data implies that the density of predictive age of Parasuicides is maximal on the young adult and teenagers.

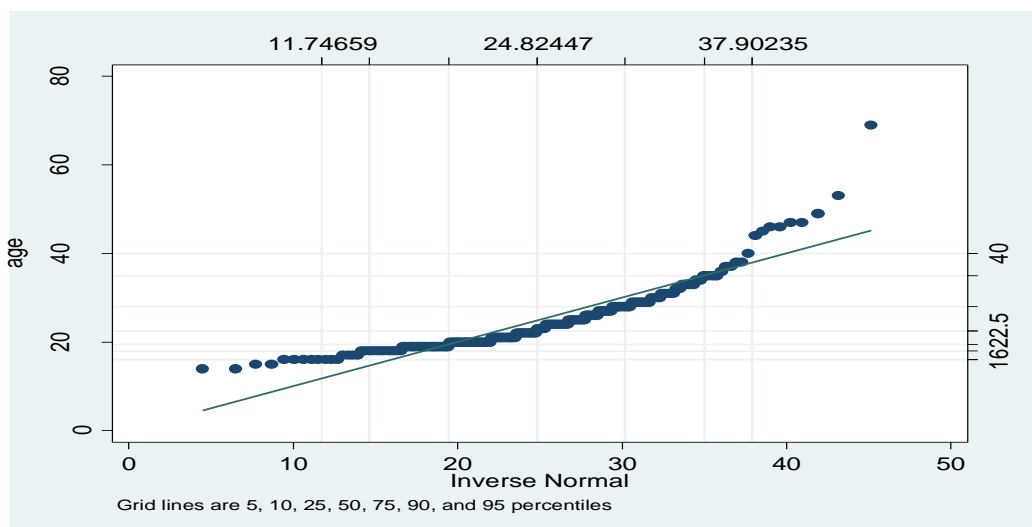
Figure 2 shows that the frequency of parasuicide is maximal at age 20.



**Figure 1.** Showing the Density of Age among Parasuicide Cases Registered at A&E of PMH



**Figure 2.** Showing the Age-Frequency of Parasuicide Cases Registered at the A&E of PMH

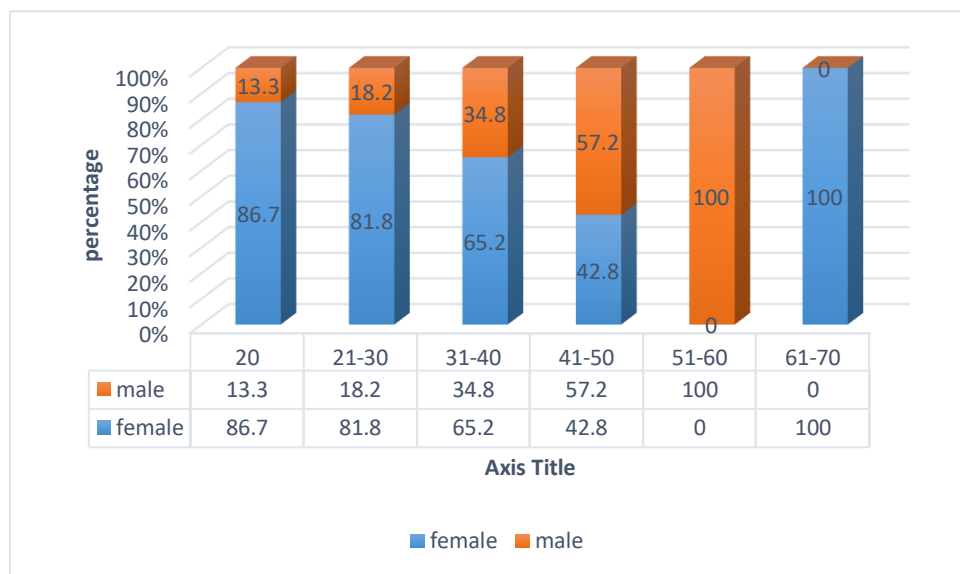


**Figure 3.** Showing the Age Progression of Parasuicide Cases Admitted at the A&E of Princess Marina Hospital

**Table 3.** Showing Gender Distribution by Age Category among Parasuicide Cases Registered at the Accident and Emergency of PMH

Agecat2	1	2	Total
20	59	9	68
30	72	16	88
40	15	8	23
50	3	4	7
60	0	1	1
70	1	0	1
Total	150	38	188

Legend: Age group(agecat): 20: < or = 20 years; 30: 21 – 30 years; 40: 31 – 40 years; 50: 41 – 50 years; 60: 51 – 60 years; 70: 61 – 70 years; Gender: 1. female; 2. Male.



**Figure 4.** Showing Percentage of Gender Distribution by Age Category among Parasuicide Cases

Table 4 and figure 4 show the predominance of female in the peak-age group 21-30 years (81.8% female versus 18.2% male). Females are also predominant among teenagers (age

group below 20 years) with 86.7% against 13.3% of males. Males have the lead on the age category 41-50.

**Table 4.** Showing Patients' Distribution Based on the Gender and Occupation Status among Parasuicide Cases Registered at the Accident and Emergency of PMH

	Unemployed	Student	Employed	Unknown	Total
<b>Female</b>	24 (72.7%)	71 (85.54%)	4 (66.66%)	51 (72.7%)	<b>150</b>
<b>Male</b>	9 (27.3%)	12 (14.46%)	2 (33.34%)	15 (17.3%)	<b>38</b>
<b>Total</b>	<b>33 (17.55%)</b>	<b>83 (44.15%)</b>	<b>6 (3.19%)</b>	<b>66 (35.11%)</b>	<b>188</b>

The majority of patients were students (44.15%). Among the students, 85.54% were females and 14.46% were males. Following the group of students, there is a considerable number of patients without unknown employment status (35.11%). 72.7% of them

were female and 17.3% were males. And then 17.55% of patients were unemployed among which 72.7% were females and 27.3% were males. Only 3.19% were employed, predominantly females (66.66% v 33.34%). In all group females were predominant.

**Table 5.** Showing Influencing Factors by Gender among Parasuicide Cases Registered at the Accident and Emergency of PMH

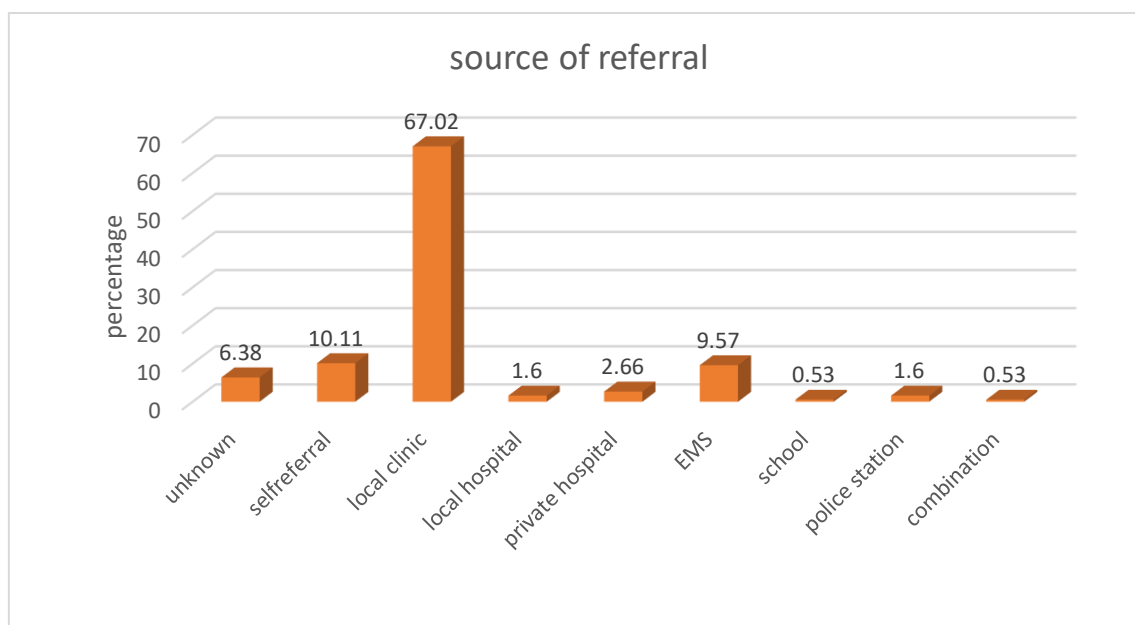
	0	1	2	3	4	5	6	7	8	Total
<b>Female</b>	44(78.5%)	12 (80%)	32(82.0%)	48(82.5%)	3(75%)	1(100%)	6(85.7%)	1(100%)	3(100%)	<b>150</b>
<b>Male</b>	16(21.5%)	3(20%)	7(18.0%)	10(17.5%)	1(25%)	0(0%)	1(14.3%)	0(0%)	0(0%)	<b>38</b>
<b>total</b>	<b>60(31.9%)</b>	<b>15(7.9%)</b>	<b>39(20.7%)</b>	<b>58(30.8%)</b>	<b>4(2.1%)</b>	<b>1(0.5%)</b>	<b>7(3.7%)</b>	<b>1(0.5%)</b>	<b>3(1.6%)</b>	<b>188</b>

*Legend: Influencing factors: 0= unknown; 1= social problems; 2= family conflict; 3= passionate conflict; 4= school's problem; 5= illness (self or close relative); 6= unexplained stress; 7= refusal of disclose; 8= combination of 2 or more problems.*

Table 7 shows that the influencing factor was not known in 31.9% of cases. There are

30.8% of passionate conflict, 20.7% of family conflict, and 7.9% of social problems. 3.7% of patients refuse to disclose the triggering factors.

67.02% of patients in the sample data were referred from local clinic. 10.11% were self-referred followed by 9.57% of brought by EMS.

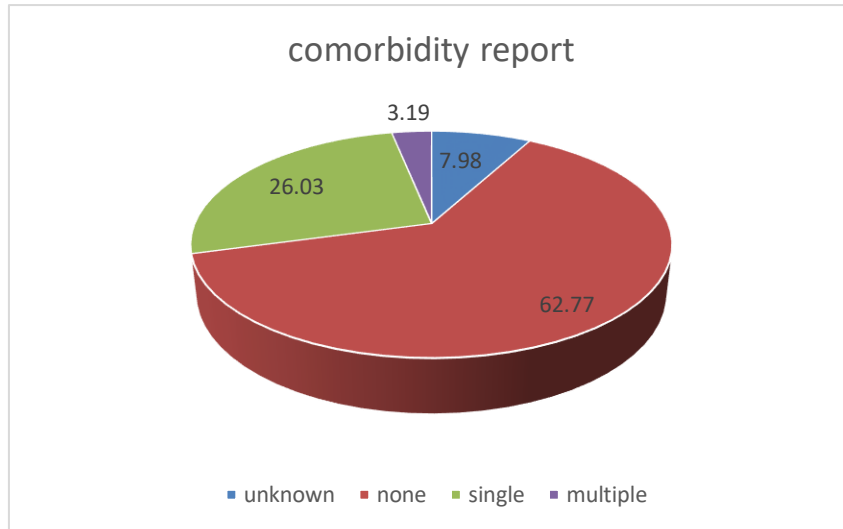


**Figure 6.** Showing Patients' Distribution by Referral Sources among Parasuicide Cases Registered at the Accident and Emergency of PMH

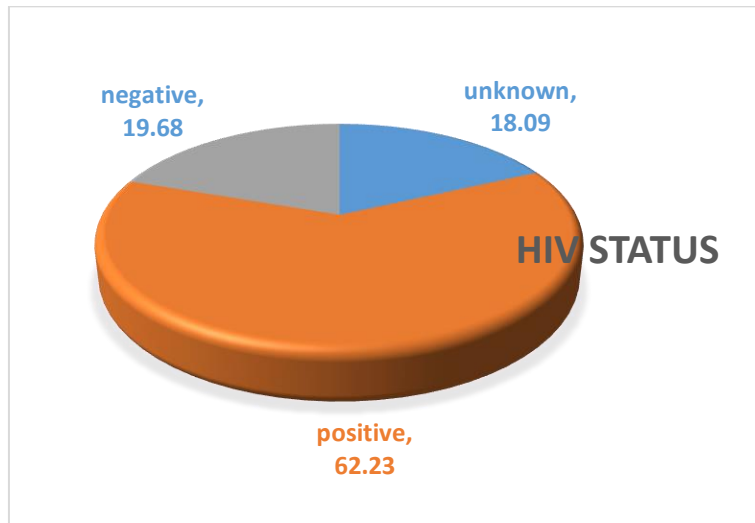
The study found that 62.77% of the sample study did not have any comorbidities, 26.03% reported one comorbidity and 3.19% of multiple.

62.23% were HIV positive versus 19.68% negative. The remaining did not perform the test (18.09%).





**Figure 7.** Showing Patients' Distribution by Morbidity Associated among Parasuicide Cases Registered at the Accident and Emergency PMH



**Figure 8.** Showing Patients' Distribution by HIV Status among Parasuicide Cases Registered at the Accident and Emergency of PMH

**Table 6.** Showing Patients' Distribution by CNS Symptoms/Signs among Parasuicide Cases Registered at the Accident and Emergency of PMH

CNSComp	Freq.	Percent	Cum.
0	138	73.40	73.40
1	50	26.60	100.00
<b>Total</b>	<b>188</b>	<b>100.00</b>	-

Legend: 0: absent, 1: present; CNSComp: CNS symptom/signs

73% of patients had no CNS symptoms.  
67.55% had normal hematologic markers versus deranged FBC in 17.02%.

There was no cardiac symptom in 82.45% of patients in the sample population.

**Table 7.** Showing Haematology Report among Parasuicide Cases Registered at the Accident and Emergency of PMH

<b>HematRep</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
<b>0</b>	32	17.02	17.02
<b>1</b>	127	67.55	84.57
<b>2</b>	29	15.43	100.00
<b>Total</b>	<b>188</b>	<b>100.00</b>	<b>-</b>

Legend: 0= deranged; 1= normal; 2= not performed; HematRep: hematology report

**Table 8.** Showing Patient Distribution by Cardiac Symptoms/Signs among Parasuicide Cases Registered at the Accident and Emergency of PMH

<b>CardioComp</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
<b>0</b>	155	82.45	82.45
<b>1</b>	33	17.55	100.00
<b>Total</b>	<b>188</b>	<b>100.00</b>	<b>-</b>

Legend: 0: absent; 1: present; cardiocomp: cardiovascular symptoms/signs

**Table 9.** Showing Renal Function Report among Parasuicide Cases Registered at the Accident and Emergency of PMH

<b>RenRep</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
0	16	8.51	8.51
1	137	72.87	81.38
2	35	18.62	100.00
Total	188	100.00	-

Legend: 0= deranged; 1= normal; 2= not performed

The sample population shows that 72.87% of patients had normal kidney function, 8.51% were deranged and in 18.62%, the test was not performed.

The Table 10 shows that the majority of patient with GI symptoms have normal liver enzymes level.

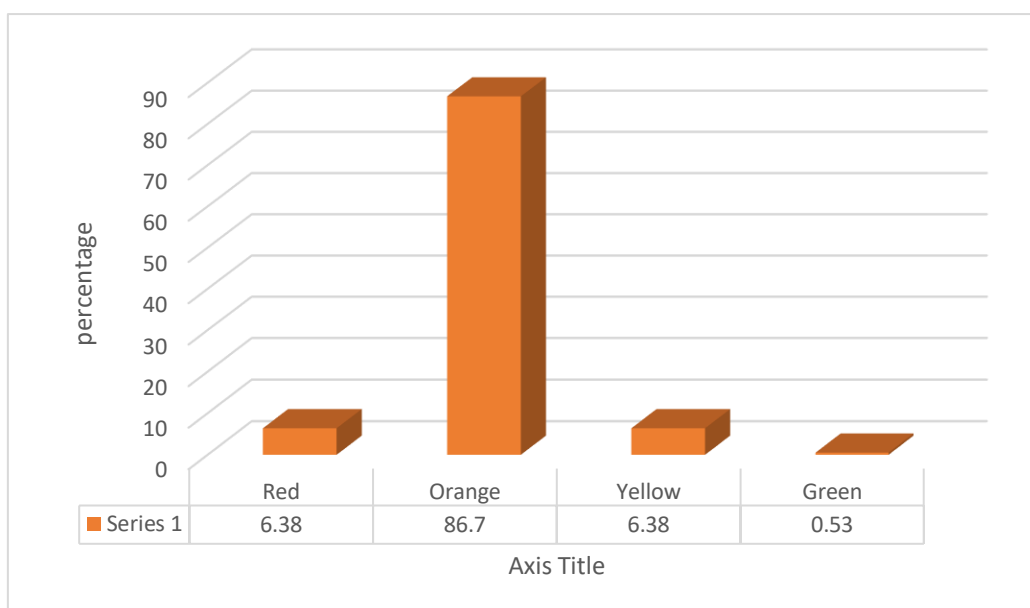
86.70% of parasuicide cases were orange and 6.38% were red. 6.38% were yellow (Figure 9).

In general, 92.03% of patients attempted suicide for the 1<sup>st</sup> time. Very few were repeated for the 2<sup>nd</sup> time representing 6.91% of the sample data (Figure 10).

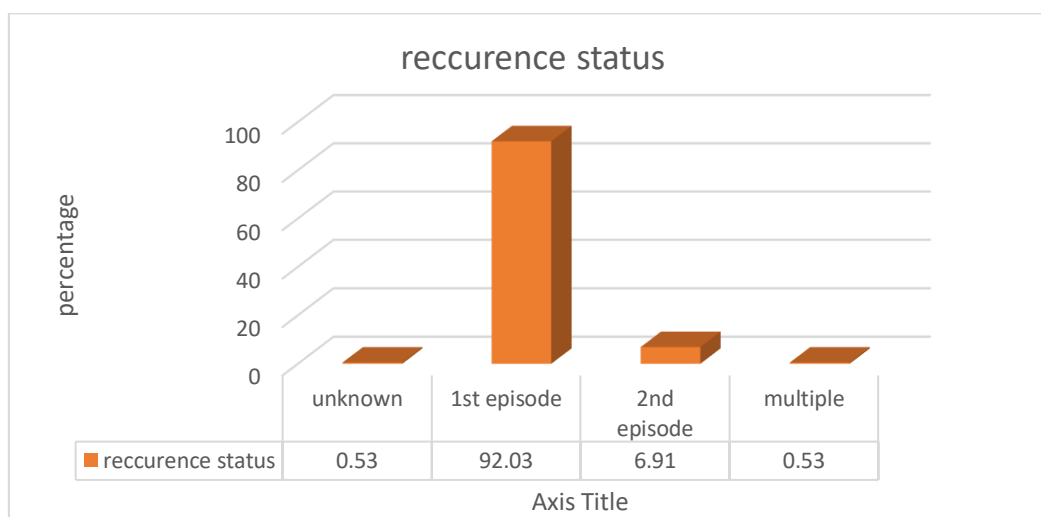
**Table 10.** Showing Patients Distribution by GI Symptoms/Signs and Liver Function Report among Parasuicide Cases Registered at the Accident and Emergency of PMH

<b>GIComp</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>Total</b>
<b>0</b>	8	71	25	1	<b>105</b>
<b>1</b>	13	59	11	0	<b>83</b>
<b>Total</b>	<b>21</b>	<b>130</b>	<b>36</b>	<b>1</b>	<b>188</b>

Legend: GI symptoms/signs: 0.absent; 1. Present; Liver function report: 0=deranged; 1= normal; 2= not performed



**Figure 9.** Showing the Severity of Parasuicide Cases Registered at the Accident and Emergency of PMH



**Figure 10.** Showing the Recurrence Status of Parasuicide Cases Registered at the Accident and Emergency of PMH

**Table 11.** Showing Patients Distribution by Gender and Method Used among Parasuicide Cases Registered at the Accident and Emergency of PMH

	Unknown	Hanging	Suffocation	Burning	Toxic agents	Combination	Total
<b>Female</b>	1(100%)	2(33.33%)	1(100%)	0(0%)	133(80.12%)	13(100%)	<b>150</b>
<b>Male</b>	0(0%)	4(66.67%)	0(0%)	1(100%)	33(19.88%)	0(0%)	<b>38</b>
<b>Total</b>	<b>1(0.53%)</b>	<b>6(3.19%)</b>	<b>1(0.53%)</b>	<b>1(0.53%)</b>	<b>166(88.29%)</b>	<b>13(6.91%)</b>	<b>188</b>

In our sample study, the majority of patients uses toxic agents in a parasuicide process. Among 166 patients, 133(80.12%) were female and 33(19.88%) were male. There is a considerable number of patients who combined

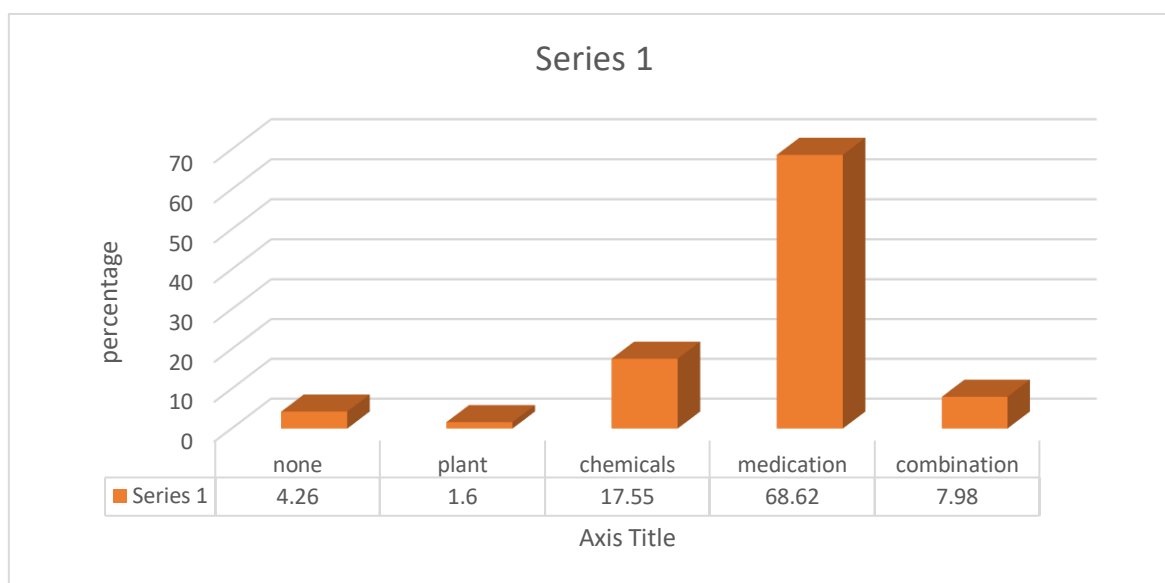
different methods (6.91%). There were all females. Males predominated in the violent methods like hanging (66.33% v 33.33%) and burning (100%).

**Table 12.** Showing Patients' Distribution by Gender and Toxic Agents Used among Parasuicide Cases Registered at the Accident and Emergency of PMH

	None	Plant	Chemicals	Medications	Combinations	Total
<b>Female</b>	4(50%)	2(66.67%)	24(72.73%)	105(81.39%)	15(100%)	<b>150</b>
<b>Male</b>	4(50%)	1(33.33%)	9(27.27%)	24(18.31%)	0(0%)	<b>38</b>
<b>Total</b>	<b>8(4.25%)</b>	<b>3(1.59%)</b>	<b>33(17.55%)</b>	<b>129(68.61%)</b>	<b>15(7.97%)</b>	<b>188</b>

Among the toxic agents used, pharmaceuticals products and chemicals were the most used (68.61% v 17.55%). At 1.59%, plants poisoning were considered. There was 7.97% of combination of different products,

mostly chemicals and medications. Looking at the gender, female were predominant (81.39% v 18.31% of medications and 72.73% v 27.27% of chemicals) than males.



**Figure 11.** Showing Patients' Distribution by Toxic Substances Used among Parasuicide Cases Registered at Accident and Emergency of PMH

As said previously in Table 11, the result shows that 68.62% of patients used medication to attempt suicide. 17.55% used some

chemicals and 7.98% combined different products.

**Table 13.** Showing Patients' Distribution by Gender and Toxic Drugs Used among Parasuicide Cases Registered at the Accident and Emergency of PMH - MediTox

Gender	0	1	2	3	4	5	6	8	9	10	11	12	13	Total
<b>1</b>	32	3	12	16	4	1	2	7	1	1	49	21	1	150
<b>2</b>	14	0	6	6	2	0	0	1	0	0	6	2	1	38
<b>Total</b>	<b>46</b>	<b>3</b>	<b>18</b>	<b>22</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>55</b>	<b>23</b>	<b>2</b>	<b>188</b>

Legend:

1. Gender: 1. Female; 2. Male.

2. Medication used: 0= none; 1= antibiotics; 2= ARV; 3= antipyretic/antalgic/anti-inflammatory; 4= supplement; 5=

contraception; 6= ATT; 7= opioids; 8= sedatives; 9= antacid; 10= chemotherapy; 11= combination; 12= unknown; 13= antiepileptic.

3. MediTox: medication used for intoxication.

It has been shown that among toxic agents, medications are the most utilised for parasuicide. Table 12 shows that 55 patients (29%) combined different pills. 23(12.3%) patients did not know the name of the pills used. 22 patients (11.7%) used pain and fever

control medication. 18 patients (9.57%) used ARV. These pharmaceuticals products were predominantly used by females: combination (89% v 11%), unknown names (91% v 9%), pain medications (72% v 28%), ARV (67% v 33%).

**Table 14.** Showing Patients’ Distribution by Chemical Substances Used among Parasuicide Cases Registered at Accident and Emergency of PMH

ChemTox	Freq.	Percent	Cum.
0	141	75.00	75.00
1	2	1.06	76.06
2	12	6.38	82.45
3	1	0.53	82.98
4	2	1.06	84.04
5	2	1.06	85.11
6	2	1.06	86.17
7	5	2.66	88.83
8	1	0.53	89.36
9	5	2.66	92.02
10	6	3.19	95.21
11	7	3.72	98.94
12	1	0.53	99.47
13	1	0.53	100.00
<b>Total</b>	<b>188</b>	<b>100.00</b>	

Legend: 0= none; 1= body lotion; 2= insect/ants poisoning; 3= permanganate of K; 4= paint solution; 5= antiseptic product; 6= battery acid; 7= kitchen chemicals; 8= ink; 9= paraffin; 10= ethanol; 11= mixture of previous product; 12= unknown; 13= mechanical product.

In the sample population, insect poisonings (6.38%), paraffin (2.66%), and ethanol (3.19%) are the most chemicals involved in the

parasuicide process. In about 3.72% of cases, a combination of different chemicals was made.

**Table 15.** Logistic Regression by Method Used and Level of Severity

Outcostat	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>MethUsed</b>	.2088725	.9887679	0.21	0.833	-1.729077	2.146822
<b>codsev</b>	-	-	-	-	-	-
<b>2</b>	-2.009346	1.266287	-1.59	0.113	-4.491223	.4725311
<b>3</b>	0	-	-	-	-	-
<b>4</b>	0	-	-	-	-	-
<b>_cons</b>	-3.211776	4.04599	-0.79	0.427	-11.14177	4.718219

The negative likelihood value shows that there is little correlation between the type of method used and the code of severity of parasuicide cases admitted at accident and emergency of princess marina hospital.

No death has been reported. 98.40% were released without any complication (Table 16).

**Table 16.** Showing Patients' Distribution by Outcome among Parasuicide Cases Registered at the Accident and Emergency of PMH

<b>Outcostat</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
<b>0</b>	185	98.40	98.40
<b>1</b>	3	1.60	100.00
<b>Total</b>	<b>188</b>	<b>100.00</b>	-

Legend: 0= alive without complication; 1= alive with complication; 2= death

The negative figure infers that the waiting time as well as the code of severity has less impact on the outcome of parasuicide cases admitted at the accident and emergency department.

**Table 17.** Logistic Regression by Outcome, Waiting Time, and Level of Severity

<b>Outcostat</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf. Interval]</b>	
<b>waittime</b>	0	(omitted)				
<b>codsev</b>						
<b>2</b>	-1.878771	1.264062	-1.49	0.137	-4.356287	.5987458
<b>3</b>	0	(empty)				
<b>4</b>	0	(empty)				
<b>_cons</b>	-2.397895	1.044466	-2.30	0.022	-4.445011	-.3507797

**Table 18.** Pearson Chi2 and Fisher's Exact Test - MethUsed

<b>Gender</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>
<b>1</b>	1	2	1	0	133	13	<b>150</b>
<b>2</b>	0	4	0	1	33	0	<b>38</b>
<b>Total</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>166</b>	<b>13</b>	<b>188</b>

Pearson Chi2 (5) = 15.78.73; Pr = 0.007; Fisher's exact = 0.004

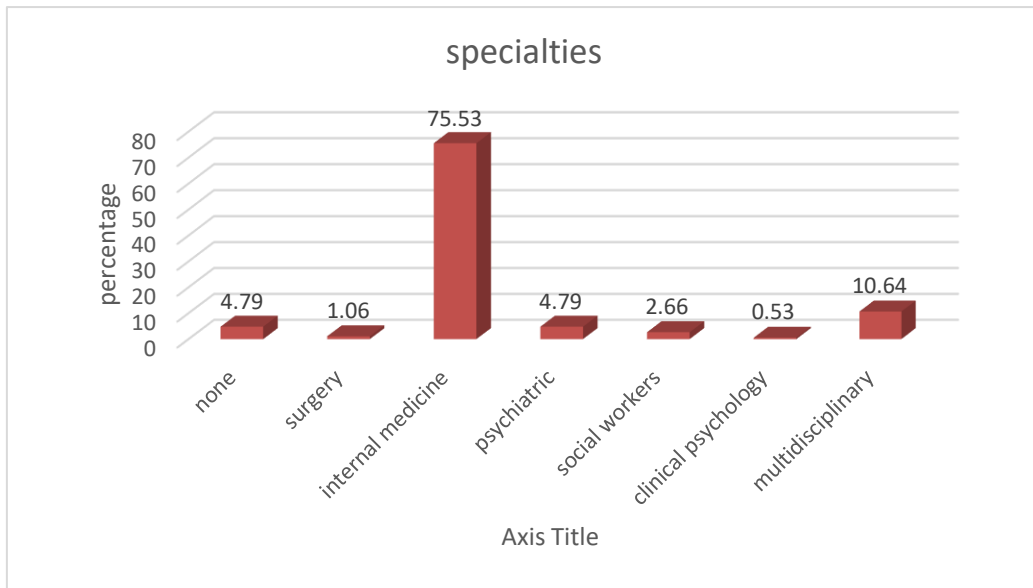
Fisher test with the p-value of 0.004 indicate gender and the choice of method for that there is strong correlation between the parasuicide.

**Table 19.** Showing Status of Waiting and Throughput Time among Parasuicide Cases Registered at the Accident and Emergency of PMH

<b>Wait time</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>Total</b>
<b>0</b>	0	4	10	14
<b>1</b>	0	4	1	5
<b>2</b>	2	29	138	169
<b>Total</b>	<b>2</b>	<b>37</b>	<b>149</b>	<b>188</b>

Legend: 0= unknown; 1= within the required time; 2= beyond the required time, waittime= waiting time; tptime = throughput time

The large majority of patient waited beyond the required time to be attended by medical officer (169, 89%). In the same way they stayed beyond time in the ward before being dispatched from the accident and emergency (149, 79%).

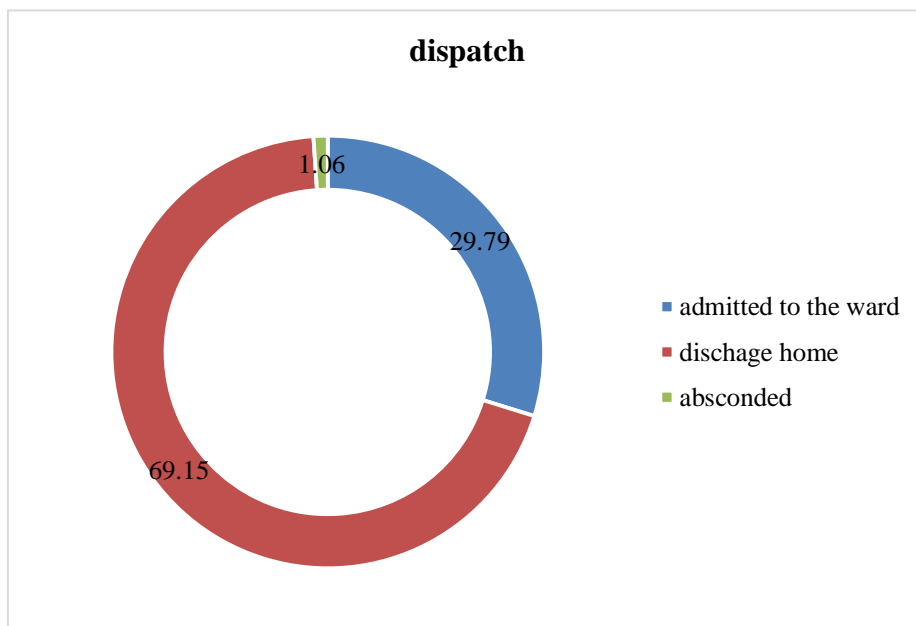


**Figure 12.** Showing the Different Specialties Involved in Parasuicide Cases Registered at the Accident and Emergency of PMH

75.53% cases were attended by the physician, while about 10.64% were followed by a multidisciplinary team. The psychiatric team was involved in 4.79% of cases. There is a number of patients (4.79%) discharged through

the accident an emergency without being attended by any other specialties.

69.15% of the parasuicide cases are admitted in the wards while 29.79% are discharge home. Few patients had absconded representing 1.06%



**Figure 13.** Showing the Dispatch of Parasuicide Cases Registered at the Accident and Emergency of PMH

Logistic regression, Number of obs =188.  
 LR chi2 (1) =2.28.  
 Prob > chi2 =0.1313.

Log likelihood = -14.250872 Pseudo R2 =  
 0.0740 (Table 20).

**Table 20.** Logistic Regression by Outcome and Code of Severity

Outcostat	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>codsev</b>	-2.03139	1.227055	-1.66	0.098	-4.436374	.3735934
<b>_cons</b>	-.3453592	2.148364	-0.16	0.872	-4.556074	3.865356

As reported in Table 19, there was no correlation between the code of severity and the outcome of parasuicide cases at the ED.

LR chi2 (1) = 2.22.

Prob > chi2 = 0.1362.

Log likelihood = -14.27916, Pseudo R2 =

Logistic regression, Number of obs = 188.

0.0721 (Table 21).

**Table 21.** Logistic Regression by Outcome and Renal Report

Outcostat	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>RenRep</b>	.1852061	.2064492	-1.51	0.130	.0208363	1.646226
<b>_cons</b>	.0729122	.0699526	-2.73	0.006	.0111211	.4780251

The OR is 0.18, indicating that the outcome of parasuicide patients was less influenced by the deranged renal function results.

Log likelihood = -15.388227.

Pseudo R2 = 0.0001.

OR = 1.05; this indicate that the outcome of the parasuicide cases was strongly influenced by the deranged hematologic markers.

Logistic regression, Number of obs= 188.

LR chi2 (1) = 0.00.

Prob > chi2 = 0.9610.

**Table 22.** Logistic Regression by Outcome and Haematology Report

Outcostat	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>HematRep</b>	1.051291	1.074621	0.05	0.961	.1417853	7.794972
<b>_cons</b>	.0154313	.0181479	-3.55	0.000	.0015394	.1546867

**Table 23.** Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>SIN</b>	188	97.5	54.41507	4	191
<b>Age</b>	188	24.82447	7.950787	14	69
<b>Gender</b>	188	1.202128	0.4026593	1	2
<b>Occupstat</b>	188	1.558511	1.143118	0	3
<b>Influstat</b>	188	1.920213	1.763873	0	8
<b>Refsource</b>	188	2.260638	1.399444	0	8
<b>Waittime</b>	188	1.824468	0.5433479	0	2
<b>Tpt time</b>	188	1.781915	0.4391199	0	2
<b>Codsev</b>	188	2.010638	0.3868059	1	4
<b>Comorbrep</b>	188	1.244681	0.6406242	0	3
<b>HIVstat</b>	188	1.015957	0.6159733	0	2
<b>Parasrecu</b>	188	1.074468	0.3011337	0	3
<b>Symptpres</b>	188	3.351064	2.617128	0	6
<b>Investperf</b>	188	0.8510638	0.3569762	0	1



<b>ConstComp</b>	188	0.4202128	0.494911	0	1
<b>GIComp</b>	188	0.4414894	0.4978906	0	1
<b>CNSComp</b>	188	0.2659574	0.4430215	0	1
<b>RenComp</b>	188	0.0053191	0.0729325	0	1
<b>CardioComp</b>	188	0.1755319	0.3814372	0	1
<b>HematRep</b>	188	0.9840426	0.5709179	0	2
<b>LivRep</b>	0	-	-	-	-
<b>RenRep</b>	188	1.101064	0.5123073	0	2
<b>RayRep</b>	188	0.9680851	0.1762429	0	1
<b>PrimMan</b>	188	0.4202128	0.5056007	0	2
<b>TreaTyp</b>	188	1.691489	1.565173	0	4
<b>TreatSyst</b>	188	2.835106	2.581183	0	8
<b>DepartRef</b>	188	0.0478723	0.2140662	0	1
<b>DepartInt</b>	188	2.643617	1.726054	0	7
<b>MethUsed</b>	188	3.93617	0.6830023	0	5
<b>ToxUsed</b>	188	2.744681	0.8002162	0	4
<b>ChemTox</b>	188	1.643617	3.413658	0	13
<b>MediTox</b>	188	6.042553	4.959547	0	13
<b>MediUse</b>	188	1.367021	0.9581498	0	3
<b>Outcostat</b>	188	0.0159574	0.1256454	0	1
<b>HospDisp</b>	188	0.712766	0.4766716	0	2

Table 25 provides the mean – age with standard deviation at 24.8 +/- 7.9 years old.

## Discussion

This study sought to determine different characteristics of parasuicide amongst patients presenting at the accident and emergency of princess marina hospital. The initial management as well as the outcome was also investigated.

Overall, parasuicide is shown to be more prevalent in female than male in this study. This finding is consistent with reports submitted by other investigators [9]. In this study, parasuicide reaches its peak in the age group 21 – 30 years old, and it decreases slowly to close to nil beyond 50 years. There is as well a high percentage of teenagers attempting suicide. This finding is in correlation with previous investigators’ reports [9]. Furthermore, the prevalence of parasuicide among the predominant age-groups is higher for females than males.

Although we have a huge number of patients with non-specified occupational status, most patients in the population study were students followed by the unemployed. Very few patients reported to be employed. This shows that the circumstances surrounding students’ activities like exams ‘results as well as the status of unemployment which follows the end of school, may influence suicide tendency. Furthermore, passional conflict, family conflicts and other social problems have a considerable impact on the parasuicide process. These negative life events have been raised in other reports by previous investigators [10].

About the source of referral, most patients in the population study seek medical assistance through local clinic and/or EMS. There was a non-negligible number of self-referral. This has an impact on the severity of patients’ conditions as well as their outcome, as most of the patients get medical assistance much early before arrival at the emergency department.

In this study, most patients were healthy (62.77% of patients without comorbidity) against about 30% of patients with comorbidities other than HIV/aids. While looking at their HIV status, 62% were positive. This is in correlation with previous studies which highlighted medical conditions as one of the triggering factors leading to parasuicide [11].

Tables 6 – 10 described the clinical presentation of patients with parasuicide at the time of admission to the emergency department. In general, parasuicide cases are more likely to develop gastrointestinal symptoms (44.14%) than CNS (26.60%) and cardiac symptoms (17.55%). However, a quarter of the patients has deranged basic blood results affecting vital organs (11.17% for the liver, 17.02% for FBC and 8.51% for the kidneys). In previous studies, CNS disturbance were shown to be predominant with 20% of laboratory results disturbances [12].

However, the blood tests were performed in an acute situation at the time of admission at the accident and emergency department. No further investigations were performed to establish whether the acute organic injuries (liver or kidney) and hematologic disturbances were permanently established or resolved. Thus, a future study will be necessary on this matter.

This study also looked at the severity of parasuicide cases attended at the accident and emergency department. Based on the triage system used at the department, parasuicide cases are color-coded according to the clinical presentation. This study found that 86.70% of cases were coded orange, while 6.38% were coded red and yellow each. Only 0.53% was green. This code defined the urgency of the case. According to this findings, most patients are coded orange and require urgent medical attention (within 20 minutes of arrival to the emergency department). The patients were coded as very urgent based on their clinical findings and not because of their suicidal

attempt or ideation. This is in correlation with several previous study [13]. In the Allison 'study, another type of scale to define the urgency of the conditions was used.

However, the study shows that most patients waited longer to be attended by the doctors (90%) after being triaged. This is probably explained by the chronic shortage of doctors at the emergency department of the Princess Marina hospital. Furthermore, parasuicide cases are generally considered as “attention seeking”, manipulative behavior” or “cry for help”.

Also, most patients waited longer again to be dispatched from the emergency department (79%). This delay is due to the admission protocol at this referral facility. Generally, patients wait for the admitting team to review them in the emergency department. In Other hospitals, such patients will be sent to the relevant specialty after being attended and stabilized by the emergency doctors.

Moreover, the severity of parasuicide cases was also indexed by the recurrence of the parasuicide. This study has shown that most patients attempted suicide for their 1<sup>st</sup> time (92.02%). Only 6.98% repeated a suicidal attempt. This figure is less than findings from previous studies, which reported 15% of previously attempted suicide admitted at the emergency department [14].

In this study, different methods were used in the parasuicide processes. Non-violent methods were used in 88.3% of cases. Very few patients used violent methods like hanging (3.19%, suffocation (0.5%), burning (0.5%). This finding correlates with the previous publication [15]. Also, looking at the non-violent methods, females were predominant than males (80% and 20% respectively). Concerning the types of toxic agents used, pharmaceuticals and chemicals products were the most utilized products for parasuicide (68.62% and 17.55% respectively). 7.98% of patients combined different toxic agents. The study also shows that it is rare for our patients to opt for plant poisoning during a parasuicide process.

Furthermore, the study looked at the choice of toxic agents among genders. The finding confirmed that females were using pharmaceuticals (81.6% v 18.6%) and chemicals (71.7% v 27.3%) more than males. Also, only female combined different toxic agents (100%).

Looking at the pharmaceuticals, the study finds that in majority of cases, patients combined different pills (.). There is a very high number of patients using pills without knowing the names. This is explained by the fact that the population in Botswana generally addresses pills more by the consistency and the color than the names. This was followed by the over-the-counter pills like antipyretic, analgic and anti-inflammatory tablets accounting for. These tablets are generally kept at home. This finding confirms previous studies from other authors [9].

Concerning the chemicals, the sample population study shows that the most used chemicals are insect poisoning, ethanol, paraffin, and kitchen chemicals. A considerable number of patients made a cocktail of these products. In previous study done in Botswana, household chemicals were predominant, and very few cases of patients used insect poisoning [9].

In this study, the outcome of the patients in the population study shows satisfactory results. Most patients were discharged without any complications (98.40%) and not death was recorded. Yet this outcome is limited to the acute setting and did not take into consideration the long term impact of suicidal attempt.

At the emergency department, most patients (75.53%) were attended by the internal medicine team. This team generally admits these cases as the facility lack a psychiatric ward or units. In some circumstances, the psychiatric team (4.79%), the clinical psychologist (0.53%) and the social workers (2.66%) were involved in the management of these patients. Only 10.44% of patients were concomitantly managed by a multidisciplinary

team. In an acute setting, there is lack of multidisciplinary involvement, which may impact the future outcome of these patients. Different research have demonstrated the importance of a multidisciplinary team for patients with suicidal attempts and ideation. This team can be built at the first contact at the ED department, in goal to reduce the future complication and recurrence of parasuicide [16].

## Limitations of the Present Study

Firstly, the present study was conducted at the referral hospital which is in the urban area. So, the result could not be generalized to the entire population; as residents from rural areas have different habits and may attempt suicide using different methods (traditional medicines, plant poisoning).

Also, the study was retrospective relying on the quality of data kept at the hospital. Moreover, there was frequently an “unknown” parameter in all the variables studied. Furthermore, we did not have permission to get in contact with the population sample to complete missing data like socio demographic information.

Lastly the investigations performed were limited to the basic blood parameters (hematology, liver functions and kidneys functions) and could not specify the types of toxic agents used.

## Conclusion

Study was conducted at one a public referral hospital in Gaborone, among patients who are generally originated from Botswana with easy accessibility to medical care. The main findings of this study are summarized as follow:

1. Parasuicide represents 0.88% of patients at the ED of PMH.; and in general, with very good outcome.
2. Female were largely predominant in most of all the group age with a peak among teenagers and young adult. The mean age was found to be 24.8 years old with a

predominance of the age group between 21 and 30 years old.

3. Factors associated with parasuicide are predominantly passionate conflicts, family conflicts and social problems. In a non-negligible percentage, the triggers were multifactorial.
4. Most patients were students and unemployed, which correlate with the predominant age group.
5. Most patients were free of comorbidity other than retroviral diseases. Although more than 60% of patients have HIV/AIDS, we could not establish a correlation between HIV and parasuicide.
6. Looking at the clinical presentation, most of patients are asymptomatic, with normal blood results.

Different methods are used for parasuicide. Non-violent methods like ingestion of toxic agent are more predominant in female than in

males. Also, among the toxic agents used, pharmaceuticals products and chemicals are the most used.

In a few cases, patients are attended to through a multidisciplinary approach, impacting their future outcome.

Taking into consideration the findings and the limitations of this present study, further prospective studies are recommended to elaborate different areas of this study which are, and not limited to, the rural area, the management of parasuicide in district and primary hospitals; and the role of the multidisciplinary approach and its future impact in the management of parasuicide cases.

### Conflict of Interest

The authors declare that there is no conflict of interest with respect to the work described in this manuscript.

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