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# Suicide and Suicide Attempts Among Patients Attending Primary Health Care Facilities in Uganda: A Medical Records Review

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**Background:** Suicide is one of the leading causes of death globally, accounting for about 800,000 deaths annually. The suicide burden drastically increased since the beginning of the COVID-19 pandemic. In Uganda, no known study has determined the suicide rate since the beginning of the COVID-19 pandemic.

**Objective:** To determine the suicide mortality rate and describe the characteristics of victims of suicide attempts from January to December 2020 in south western Uganda.

**Methods:** This study was based on the health management information systems (HMIS) of patients' registered data for the year 2020 at 15 selected primary health care facilities in four districts in south-western Uganda. We used a data extraction tool to capture demographic and clinical characteristics of the individuals who had attempted or completed suicide. We estimated yearly incidence rates of fatal and non-fatal suicide attempts, and used chi-square and *t*-test to determine the statistical difference between suicide attempt outcomes.

**Results:** A total of 130 non-fatal suicide attempts and 26 suicides were identified. Majority were male 69.87% (n = 109/156) and the mean age was 27.16 (SD = 14.71) years. The overall incidence of suicide attempts was about 60 attempts per 100,000 people, while that of completed suicide was about three deaths per 100,000 people. The suicide attempts increased following the first month of COVID-19 lockdown in the country (March 2020) and most individuals attempted suicide by poisoning (n = 144).

**Conclusion:** Suicide is a common occurrence in primary health care settings of Uganda and there has been a rapid increase in suicide attempts since the onset of the COVID-19 pandemic. With suicide by poisoning being common, there is need for proactive interventions, such as the control of pesticides and herbicides, to prevent suicide among members of this community, especially during pandemic conditions.

**Keywords:** suicide, non-fatal suicide attempt, suicide attempt, primary health care, COVID-19, pandemic, Uganda

## Introduction

Suicide is one of the leading causes of death globally, with 1 in every 100 deaths due to suicide.<sup>1</sup> For each fatal suicide, there are many more persons with serious suicidal ideations and non-fatal suicide attempts.<sup>2</sup> Suicide rates are reported to have increased during the COVID-19 pandemic in most parts of the globe.<sup>3-7</sup> However, some countries like Canada reported a decline from 10.82 per 100,000 pre-pandemic to 7.34 per 100,000 during the pandemic.<sup>8</sup> Approximately 44% of people with suicidal ideations have contacted their health care providers in the month before their suicide attempt, and most leave the health care facilities without proper assessment and management.<sup>9</sup> This scenario is attributed to poor mental health services in primary healthcare facilities especially in low-income settings such as Uganda.<sup>10</sup> For example, in terms of human resource, compared with global averages of 3.96 psychiatrists per 100,000 people,<sup>11</sup> Uganda had less

than 50 psychiatrists to serve over 44 million people during the COVID-19 pandemic; a number too low to serve the overwhelming mental health burden in the country.

In Uganda, the mental health services are offered at different levels of health facilities starting with health centres II to IV, then general hospitals, regional referral hospitals (tertiary health facility), and at the national referral hospitals.<sup>12,13</sup> The expertise and knowledge about mental illness such as suicide assessment and management are better at higher facility levels, beginning at health centre IV.<sup>12</sup> Mental health professionals work from health centres (psychiatric nurses), general hospital (psychiatry nurses and psychiatric clinical officers), and then specialist psychiatrists and other mental health professionals at regional and national referral hospitals.<sup>13</sup> The health workers at the lower primary health facilities (II to III) are believed to have lower levels of knowledge, poor attitude, and higher levels of stigma about suicide. In addition, individuals with suicidality have poor health seeking behaviors since suicide is considered illegal in Uganda.<sup>14,15</sup> Individuals who attempt suicide (a criminal offence) are sentenced for six months, an action carried out to keep the victim safe and give them time to change their mindset about suicide.<sup>16,17</sup> However, no mental illness or psychological treatment is given in jail to these individuals.<sup>16,18</sup> According to the Penal Code Act of Uganda, suicide is still considered as a criminal act. The illegality of suicide forces many to aim at completed suicide instead of being considered criminals after a failed suicide attempt.<sup>14,15</sup> The methods used for completing suicide in Uganda include: hanging, drug overdose, burning, ingestion of poisons, jumping from a height, drowning, among others.<sup>14,15,19</sup>

In Uganda, the suicide rate declined from 15.91 per 100,000 population in the year 2000 to 4.6 per 100,000 people in 2018.<sup>20,21</sup> This decline may be associated with improvement in the country's mental health care services over the years. However, during the COVID-19 pandemic, the mental health burden and suicide cases increased across the globe.<sup>6,7,22,23</sup> Therefore, in this study we describe the burden of suicide during the first year of the COVID-19 pandemic in south-western Uganda. A country where the mental health units were used as COVID-19 treatment centres. The findings of this study may give policy makers and mental health practitioners some insight into what may be expected as the pandemic progresses, for better preparation and interventions. With the country having no known suicide database, we performed a retrospective review of the health management information system (HMIS) registers to describe suicide occurrence during the first year of the COVID-19 pandemic.

## Methods

### Study Design and Area

This was an observational retrospective medical records review of patient information (both inpatients and outpatients) collected between January and December 2020, at 15 rural-based public health facilities (five HC III, nine HC IV, and a hospital) in four randomly selected districts (Mbarara, Rwampara, Ntungamo, and Isingiro) in south-western Uganda. The primary source of data was the Ministry of Health paper-based Health Management Information System (HMIS) registers for patient chartings, that captures the patient identification number, name, address, age, anthropometric measurements, gender, next of kin, substances of addiction used, physical symptoms, investigations, diagnosis, and treatments given.

### Eligibility Criteria

We only included registered patient cases of fatal or non-fatal suicide attempts across age groups. Records of all patients who were reported to have accidentally ingested poison were excluded.

### Data Collection Procedure

We identified the HMIS register for the year 2020 for each health facility. Three individuals on the research team (LMA, MMK, and BMS) checked and traced all the cases to be included, independently. In case of any inconsistency, it was discussed in the presence of the content expert GZR. MMK entered the data in a pretested web-based, researcher developed *Google Form*. The entered data included level of health facility, month of the event, age, gender, district of origin, physical illness present, mental illness diagnosis, history of substance use, type of substance used/abused, and the

method used to attempt or die by suicide. We also collected the total number of patients who attended the various facilities in 2020 from the district biostatisticians.

## Ethical Considerations

The study complied with the ethical guidelines of the *Declarations of Helsinki*. Mbarara University Research Ethics committee reviewed and approved the study (MUREC 21/12-20). A waiver of informed consent was granted since we collected retrospective data and majority of the individuals could not be traced. Permission to conduct the records reviews in the HCs was obtained from the respective District Health Officers and the facility heads. No participant identifiers were included at data entry and analysis.

## Data Analysis

The *Microsoft Excel* sheet of the data entered in the *Google Form* was downloaded and checked for completeness and errors by GZR. Data were analyzed using *STATA version 16.0*. Categorical variables were presented with frequencies and percentages. However, age was presented in terms of mean and standard deviation. The Gaussian assumption was used to assess for normality based on the Shapiro–Wilks test and histograms. Chi-square and Student's *t*-test were used to determine the statistical difference between non-fatal and fatal suicide attempts. Yearly incidence rates were calculated as per district and health centre level. A *p*-value <0.05 was set to be statistically significant.

## Results

We extracted a total of 156 records, 130 of which were non-fatal suicide attempts, and 26 were cases of suicide. The majority of the records were for males, 69.87% ( $n = 109/156$ ). The mean age was 27.16 (standard deviation = 14.71) years, range of 8 to 98 years, and there was no statistical difference between ages of the males and females (ie, 27.93% vs. 25.37%,  $t = -0.99$ ,  $p = 0.325$ ). Among these individuals, only 7/156 (5.15%) had a diagnosis of mental illness (ie, three with depression and four with schizophrenia). Twenty-two individuals (16.18%, 22/156) used substances of addiction (ie, two for tobacco alone, nine for alcohol alone, and 11 for both). A total of five individuals had a diagnosis of a physical illness: three had HIV; two had hypertension. The mean age of individuals who died by suicide was statistically less than that of non-fatal suicide attempts ( $t = 2.50$ ,  $p$ -value = 0.013). More females died by suicide compared to males (29.79% vs. 11.01%,  $X^2 = 8.34$ ,  $p$ -value = 0.004). For details, see [Table 1](#).

## Annual Suicide Attempt and Suicide Incidence

We found that the overall suicide attempt incidence rate in south western Uganda was about 73 suicide attempts per 100,000 people. The overall incidence of non-fatal suicide attempts among individuals were about 60 attempts per 100,000 people, while that of fatal suicide attempts were about three deaths per 100,000. Suicidal attempt incidence was highest in Ntungamo district at 72.31 suicide attempts per 100,000 people. Mbarara district and HC IVs had the highest suicide mortality rate with suicide incidence rates of 85.35 and 17.44 per 100,000 people, respectively ([Table 2](#)).

## Trends of Monthly Suicide Behaviors/Activities

As shown in [Figure 1](#), suicide attempts increased in 2020, especially after March 2020. Suicide activities among males consistently remained higher than females, especially after April. The highest incidences of suicide were in May, June, and August. However, there was a sharp decline in suicide attempts in July. There was a statistical difference between fatal and non-fatal suicide attempts across the various months ( $X^2 = 29.15$ ,  $p$ -value = 0.002). Fatal and non-fatal suicide had almost similar trends from January to July. However, fewer suicide attempts resulted in death from July till the end of the year.

## Suicide Methods Used

Almost all the individuals ( $n = 144/156$ , 92.3%) used ingestion of poisons/drug overdose to attempt or die by suicide. One individual used both cutting and poisoning. Only one individual used drowning, and the remaining ( $n = 11$ ) records did not clearly show the method used.

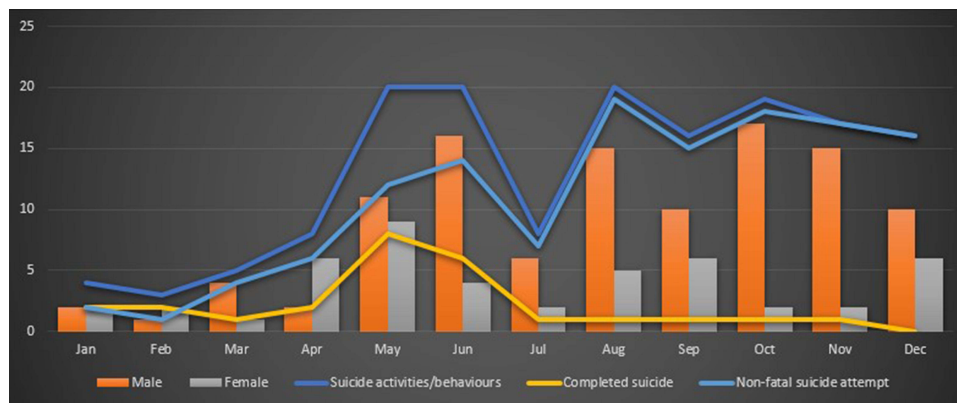
**Table 1** Relationship Between Study Variables and Suicide Outcome

Variable	n (%)	Non-Fatal Suicide Attempt; n = 130 (83.44)	Completed Suicide; n = 26 (16.56)	t/ $\chi^2$ (p value)
Age	27.16±14.71	28.49±14.61	20.69±13.72	<b>2.50 (0.013)</b>
<b>Gender</b>				
Female	47 (30.13)	33 (70.21)	14 (29.79)	<b>8.34 (0.004)</b>
Male	109 (89.87)	97 (88.99)	12 (11.01)	
<b>Substance use history</b>				
No	134 (85.90)	114 (85.07)	20 (14.93)	2.07 (0.150)
Yes (reported)	22 (14.10)	16 (72.73)	6 (27.27)	
<b>Mental illness</b>				
No/unidentified	149 (95.51)	124 (83.22)	25 (16.78)	0.03 (0.863)
Known/identified	7 (4.49)	6 (85.71)	1 (14.29)	
<b>Physical illness</b>				
No/unidentified	151 (96.79)	126 (83.44)	25 (16.56)	0.04 (0.839)
Known/identified	5 (3.21)	4 (80.00)	1 (20.00)	
<b>Referral</b>				
In	7 (4.49)	5 (71.43)	2 (28.57)	0.92 (0.631)
Out	9 (5.77)	8 (88.89)	1 (11.11)	
Missing	140 (89.74)	117 (83.57)	23 (16.43)	

**Note:** Bold values are statistically significant.

**Table 2** Shows the Yearly Suicide Incidences as per District and Level of Health Facility

	Total Number of Patients That Attended the Selected Health Facilities	Non-Fatal Suicide Attempt	Completed Suicide	Non-Fatal Suicide Attempt Incidence per 100,000	Completed Suicide per 100,000
<b>District</b>					
Isingiro	61,273	25	1	40.80	1.63
Rwampara	31,579	18	0	57.00	0
Ntungamu	96,800	70	1	72.31	1.03
Mbarara	25,775	18	22	69.83	85.35
<b>Level of health facility</b>					
Hospital	33,096	53	1	160.14	3.02
HC IV	137,607	74	24	53.78	17.44
HC III	44,724	1	0	2.24	0
<b>Overall</b>	215,427	131	6	60.81	2.78



**Figure 1** Trends of suicide activities/behaviours during the year of 2020 in south western Uganda (n = 156).

## Discussion

This study analyzed the suicide attempt incidence during the year 2020 before, during and after the first lockdown following COVID-19 pandemic. The findings show a rise in the incidence of suicide attempts following the COVID-19 total country lockdown with higher suicide mortality in the most developed/urban district of the explored areas. The lockdown and its associated loneliness and increased levels of depression led to isolation of people disrupting all the culturally known stress relievers such as religious fellowship, communal alcohol drinking, in person studying, traveling, and diversion to work/employment stress.<sup>24–28</sup> These put many individuals at risk of suicide as reported by other studies, especially due to the high level of violence use to enforce the lockdown policies.<sup>29,30</sup> The increase in suicide in our study due to the lockdown was similar a study in Japan where the monthly suicide rate increased by 16% during the second lockdown.<sup>31</sup> However, many studies showed an initial reduction in the number of suicide cases following the lock down, contrary to our findings.<sup>8,29,31,32</sup> This reported difference in the trend of suicide would best be explained by the “pulling-together effect” observed in times of national tragedies, due to people getting used to the lockdown-imposed changes.<sup>29</sup> In our study, the suicide activities remained high but fewer individuals had fatal suicide attempts.

Our study findings, show that fatalities from suicide was common among the younger individuals, a finding similar to other studies where the youth and younger individuals were more hit by effects of the pandemic including suicide.<sup>7,33</sup> Contrary to previous studies, our study showed that females completed suicide more than males who had more non-fatal suicide attempts.<sup>15</sup> Despite mental illness and comorbid medical illness being a known risk factor for suicide. We did not have enough data to make any substantial conclusion about this known risk factor. However, common risk factors for suicide such as depression, burnout, stress, and severe behavioural addictions such as gambling, internet use disorders, should be screened for among patients visiting health facilities by health workers.<sup>19,34–37</sup>

We found that many of the individuals used poisoning as a means of attempting/completing suicide, which may be attributed to the fact that individuals who use poisoning require medical intervention due to the severe traumatic physical symptoms attempters experience which prompts them being taken to hospital.<sup>38</sup> In addition, compared to methods like hanging or drowning, individuals who attempt with poisoning, depending on the poison may take longer to die. This predominant method used by attempters in our study was different from other studies which use other data sources, for instances with media report data, hanging has been the most reported method used by attempters, since hanging attracts more media attention.<sup>15,19</sup> In south-western Uganda poisoning is a common method of attempted suicide as many people may have access to pesticides and herbicides, since farming is the predominant activity in the region. The people in the region know that these medications kill when ingested, hence their predominant use to attempt suicide.<sup>14</sup> Completed suicide rates were more in the least rural district (Mbarara), a finding consistent with findings by previous researchers.<sup>39</sup> Our findings differ from those in many developed countries such as US, Canada, among others, where suicide rates are higher among rural dwellers.<sup>40,41</sup> The number of non-fatal suicide attempts increased with the level of health facility that is, higher in hospitals than health centre IV

or III, however, fewer individuals died by suicide from the hospitals, possibly due to the better emergency services offered by the hospitals compared to the lower health facilities.

## Implications and Future Direction

The information provided in this paper can be used by mental health providers and advocates to sensitize the community about suicide and its dangers. In addition, the information can be a basis for increasing health workers knowledge about suicide especially during pandemic periods. The finding that more suicide attempts were fatal in lower health facilities, health workers should be trained in emergency care for attempters and encouraged to use accurate brief suicide risk assessment tools to screen for suicidal behaviors that are based on reliable theories such as the tripartite affect-behavior-cognition theory, the suicidal barometer model, classical test theory, and item response theory.<sup>42</sup> Innovative methods should be used to screen and manage suicide among the patients for example, the use of online psychological intervention to reduce suicide. Interventions that have been popular during the COVID-19 pandemic for both suicide and depression as reported by several researchers.<sup>43</sup> The most evidence-based online psychological intervention/treatment modality is internet cognitive behaviour therapy, which is cost effective and can be used to manage other psychiatry related symptoms such as insomnia, anxiety, among others.<sup>43–45</sup>

Due to the nature of suicide behaviors and its association to the biopsychosocial spiritual and economic factors, we propose future researchers to use Online Photovoice (OPV) qualitative methods in understanding suicidal behaviors in south-western Uganda, as used in other studies.<sup>46–48</sup> OPV is an effective innovative qualitative research method that gives opportunities to the participants to express their own experience with as little manipulation as possible if at all, compared to traditional quantitative methods. Also, OPV increases group and organizational synergy especially in experimental studies.

Future researchers and policy makers should also advocate for the decriminalization of suicide in Uganda because many individuals with suicidal behaviors shy away from health facilities due to fear of receiving punishment for their suicidal behaviors. Systems should also be put in place to assess and manage victims already jailed due to attempted suicide. This can be done through regular visits to prisons by psychiatrists and other mental health professionals.

## Limitations

This study encountered some limitations such as the fact that we were extracting information from the HMIS registers, we may have failed to obtain some relevant information from the registers. Secondly, mental illness is not regularly captured in the HMIS registers, thus information bias could not be ruled out. Lastly, being rural and less economically developed, the community may have difficulty accessing the health facilities in the region due to poor transportation system, extreme poverty, among other reasons.<sup>49</sup> Many individuals who attempt suicide in the villages may not reach the facilities and this information may have been missed in our data collection. Thus, the findings may not be a true representative of suicide rates and behaviors of the region.

## Conclusions

Suicide is a common occurrence in primary health care settings of south-western Uganda and there has been a rapid increase in suicide attempts since the onset of the COVID-19 pandemic. With suicide by poisoning being common in southwestern Uganda, there is need for proactive interventions to prevent suicide among community members, especially during pandemic conditions.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Ethical Approval and Consent of Participants

The study complied with the ethical guidelines of the *Declarations of Helsinki*. Mbarara University Research Ethics committee (MUREC) reviewed and approved the study (MUREC 21/12-20). A waiver of informed consent was granted

by MUREC since we collected retrospective data and majority of the individuals could not be traced. Permission to conduct the records reviews in the HCs was obtained from the respective District Health Officers and the facility heads. No participant identifiers were included at data entry and analysis.

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## Disclosure

The authors declare that they have no conflicts of interest for this work.

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