Hanging as a method of suicide in Ghana: A 10 year autopsy study

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Abstract

**Background:** There are no official statistics on hanging as a method of suicide in Ghana. The aim of this study was to describe the proportions of deaths that were due to suicide by hanging, the gender and age characteristics and the type of ligature used and offer recommendations.

**Material and methods:** This was a retrospective autopsy study from 2003 to 2013 in our institution.

**Results:** About 0.34% of all autopsies performed were suicide by hanging. The male: female ratio was 7:1. The mean age of male victims was 35.6 years and that of females was 28.4 years. The modal age group of the females was 10-19 years (33.3%) while that of the males was 20-29 years (29.6%). There were no significant age differences between Male and female (p=0.08), male and the total study population (p=0.08) and also between female and the total population (p=0.73). The commonly used ligature by males was a nylon rope (46.9%), while that for females was electric cable (27.8%). In all 23.0% males and 33.3% females had no stated ligature used. For both males (52.3%) and females (22.2%) the common point of suspension was the branch of a tree. Many of the females have no stated point of suspension (55.6%). There were significant differences with regards to the type of ligature used and the point of suspension between male and female (p=0.018), male and the total study population (p=0.013) and also between female and the total study population (p=0.014). The reasons for suicide by hanging were not stated. There was a case each from the prison custody and the psychiatry hospital in Accra respectively.

**Conclusion:** The study found that 0.34% of all autopsies performed were suicide by hanging. The victims were mostly younger males. The commonly used ligature was a nylon rope, with tree branch as the point of suspension. As suicide by hanging is becoming common in Ghana, there is the need to develop strategies for its prevention.

Keywords: Suicide, hanging, Ghana, autopsy, ligature

Introduction

Hanging is one of the most commonly used fatal method of suicide worldwide [1-3]. Suicide rates vary by countries, age, gender, marital status, ethnicity and socioeconomic status [4,5]. The ligature mark and its characteristics is the most relevant feature of hanging at autopsy, even in instances where the ligature material is not available during autopsy. The incidence of hanging as a method of suicide is found to be on the rise in developed countries such as the United States of America and the United Kingdom [6-8].

Emerging evidence from the print and electronic media in Ghana have shown that hanging is becoming a common method of suicide especially among the productive age group [9,10]. However, there are no official statistics on hanging as a method of suicide [10-12]. The aim of this study was to describe the proportions of deaths due to suicide by hanging, the gender and age characteristics and the type of ligature used, by a descriptive autopsy data and offer recommendations.
Material and methods
Study design
This was a retrospective descriptive autopsy study.

Study site
This study was conducted in the Korle-Bu Teaching Hospital Mortuary, the largest mortuary in the country Ghana, where between 3,000 and 6,000 autopsies are performed each year. This mortuary receives cases from the Korle-Bu teaching hospital, the largest referral hospital in Ghana; other hospitals within the Accra Metropolis, neighbouring towns and Districts. It also performs most coroners’ autopsies in the southern half of the country.

Data collection and analysis
Autopsy log books, autopsy sheets and the coroner request forms for the period January 2003 through December 2013, were reviewed by two pathologists for the following: age and sex of the victim, location of death, reasons for hanging if available, type of ligature and point of suspension and the autopsy findings. Data were entered into a computerized spreadsheet and analyzed using SPSS software (Version 20). Frequency distributions and descriptive statistics were calculated for each variable.

Inclusion criteria
1. All well preserved bodies.
2. All cases of suicide by hanging.
3. All cases with well-defined ligature marks.

Exclusion criteria
1. Suicide deaths not by hanging.
2. All cases without a ligature mark.
3. Poorly preserved bodies.

Results
During the period of study (2003-2013), the total number of autopsies performed in our institution was 44,000, of which 148 (0.34%) were deaths due to suicide by hanging. A total of 130 (87.8%) of the victims were males with 18 (12.2%) females. The male: female ratio was approximately 7:1. The age range of the entire study population was 11 to 75 years with a mean age of 34.7 years (SD=14.1) and a modal age group of 20-29 years (28.7%). The age range for the male victims was 11-75 years, mean age of 35.6 years (SD=14.0) and modal age group of 20-29 years (29.6%). The age range for the females was 12-52 years, mean age of 28.4 years (SD=13.5) and modal age group 12-19 (33.3%) years.

Table 1a. Age distribution of victims of suicide by hanging.

| Age group (years) | Males (n/%) | Females (n/%) | Total (n/%) |
|------------------|-------------|--------------|-------------|
| ≤19              | 12 (9.6)    | 6 (33.3)     | 18 (12.6)   |
| 20-29            | 37 (29.6)   | 4 (22.2)     | 41 (28.7)   |
| 30-39            | 31 (24.8)   | 5 (27.8)     | 36 (25.1)   |
| 40-49            | 24 (19.2)   | 0 (0.0)      | 24 (16.8)   |
| 50-59            | 12 (9.6)    | 3 (16.7)     | 15 (10.5)   |
| ≥60              | 9 (7.2)     | 0 (0.0)      | 9 (6.3)     |
| Total            | 125 (100.0) | 18 (100.0)   | 143 (100.0) |

Table 1b. Paired differences test of victims of suicide by hanging.

|         | Mean   | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | t     | df    | P-values |
|---------|--------|----------------|-----------------|-----------------------------------------|-------|-------|----------|
| Male–Female | 15.28571 | 30.14478       | 8.05653         | -2.11936                                | 32.69079 | 1.897  | 13 0.080 |
| Male-Total | -2.57143 | 5.07413        | 1.35612         | -5.50115                                | 0.35829 | -1.896 | 13 0.080 |
| Female-Total | -17.85714 | 34.27728       | 9.16099         | -37.64825                               | 1.93397 | -1.949 | 13 0.073 |

There are no significant differences between Male, Female and Total victims of suicide by hanging among the various age groups since the p-values 0.08, 0.80 and 0.73 are greater 0.05.
The common point of suspension for both males (48.6%) and females (22.2%) was the branch of a tree. Many (55.6%) of the female victims had no stated point of suspension. Deaths in males were by complete suspension (100.0%). A total of 16 (88.9%) of the female deaths were complete suspension, while 2 (11.1%) were incomplete, consisting of hanging by the door handle and a tree branch respectively. There were significant differences with regards to the type of ligature used and the point of suspension between male and female (p=0.018), male and the total study population (p=0.013) and also between female and the total study population (p=0.014) (Tables 2a and 2b).

The reasons why victims committed suicide by hanging in this study were not stated in any of the cases, but there was a case each from the prison custody (male, using a sponge) and the psychiatry hospital (male, ligature not stated) in Accra respectively.

**Discussion**

The story of suicide is probably as old as man himself. Suicide by hanging has cultural, religious and criminal implications to the community in which the act was committed and to the victim’s household, although it is said to be a private and a personal act. According to WHO hanging is the commonly used method of suicide in the developed [1,2] and developing countries [3]. The rates vary by country, socioeconomic and...
the sociocultural status of the individual [4,5]. In this study, it was found that 0.34% of all autopsies performed in our institution were suicide deaths by hanging, there was no trend in the numbers of suicide deaths over the study of period. This differs from studies in the United States of America (USA) [6] and the United Kingdom (UK) [7,8] that found rising trend in the number of persons who commit suicide by hanging. Actual data on suicide death by hanging in Ghana as indicated by the Ghana Statistical Service is scanty [9] and are mostly by the medical sociologists and the Psychiatrists [10-12]. Therefore a rate of 0.34% in this current study is deemed significant, judging from the fact that this was the first institution-based autopsy study in Ghana with no previous autopsy statistics to compare with. The lack of data or the low rates of hanging as a method of suicide in our country can partly be attributed to the taboos and criminality ascribed to death by hanging in our society [13,14] and this create fertile ground for under reporting of suicide related deaths as mentioned in previous studies in Ghana and other countries [15,16].

In this current study it was found that suicide by hanging was more common in the younger age groups with mean age of 34.7 years (SD=14.1) and a modal age group of 20-29 years. This is similar to studies by Quasrhe et al., in Ghana, [10] and Stark et al., in Scotland [17], who found younger age group to commonly commit suicide by hanging. The current findings however differ from studies in the United States of America that found the act to be more common in the middle-aged adults [18-20]. The great majority of suicide deaths in this study were males, with male - female ratio of 7:1. This is similar to studies that found the male gender to commonly commit suicide by hanging [21-25].

For any individual to successfully commit suicide by hanging no matter the geographical location or level of education, access to a ligature is an important factor that leads the person to suicidal action [25,26]. In this study victims committed suicide using every day common items such as; ropes, belts, electric cables, sponge and cloths. This spectrum of ligatures used are similar to those found in other autopsy studies [26-30]. The common points of suspension in this study were tree branches and the ceiling of the roof, a finding that is similar to the study of Vipul et al., [27] and Oliver et al., [31] This study also found that 98.6% of the hangings were complete, a value higher than the 50% found by Olive et al., [31] and the 67.7% found in Vipul et al., autopsy study [27]. This value is however closer to 97.2% found in Ahmed et al., autopsy study [32].

The reasons why individuals commit suicide are heterogeneous, multifactorial and not a consequence of a single cause or stressor. These include psychosocial and psychiatric factors, familial or genetic tendencies, childhood experiences and underlying metabolic conditions [31,33]. Studies have shown that in about 25% to 30% of suicide victims leave a note, stating the reasons for the act [34,35]. Unfortunately, in this current institutional based study, there were no reasons for the act. This may be due to the fact that the study was a retrospective study and also because the act is considered by culture to be an abomination and punishable by the laws of the country and also by God.

This study found that 1.4% of the deaths occurred in the prison custody and the psychiatric hospital in Accra respectively. Although a smaller value compared to the 6.0% found in Oliver et al., study [31], it supports studies that found hanging as a common method of suicides in these settings, these deaths could have prevented by having a ligature free environment [36,37].

Limitations
1. Incomplete autopsy reports by the pathologist.
2. Scanty history provided by relatives and the police investigators.
3. In some cases the ligatures are removed before the body is brought for autopsy.

Recommendations
Commitment by the Ghana government to establish and implement coordinated plans of action, including paying attention to mental health care services in the country. This will reduce deaths by suicide.

Involvement by the society in addressing this public health problem which has been shrouded in taboo for far too long. Provision of traditional support systems in the country especially the economic and social values must be strengthened to help reduce incidence of suicide in Ghana.

To decriminalize the law (1960 criminal act 29 section 57) criminalizing attempted suicide in Ghana.

Conclusion
The study found that 0.34 % of all autopsies performed were deaths due to suicide by hanging. The victims were mostly younger male with male: female ratio of 7:1. The commonly used ligature was a nylon rope with the tree branch as the point of suspension. As suicide by hanging is becoming common in Ghana, there is the need to develop strategies for its prevention.

Competing interests
The authors declare that they have no competing interests.

Authors’ contributions

| Authors’ contributions          | EMD | IAD | LKD | AAB |
|--------------------------------|-----|-----|-----|-----|
| Research concept and design    | ✓   | --  | --  | --  |
| Collection and/or assembly of data | ✓  | ✓   | ✓   | --  |
| Data analysis and interpretation | ✓  | ✓   | ✓   | --  |
| Writing the article            | ✓   | --  | --  | ✓   |
| Critical revision of the article | ✓  | ✓   | ✓   | --  |
| Final approval of article      | ✓   | ✓   | ✓   | ✓   |
| Statistical analysis           | ✓   | --  | --  | --  |

Acknowledgement
Thanks to all residents and the biomedical staff of the department of pathology for their support.
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Citation:
Der EM, Dakwah IA, Derkyi-Kwarteng L and Badu AA. Hanging as a method of suicide in Ghana: A 10 year autopsy study. Pathol Discov. 2016; 4:2. http://dx.doi.org/10.7243/2052-7896-4-2