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The epidemiology of homicidal strangulation in the City of Johannesburg, South Africa

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ABSTRACT

Studies that provide accurate descriptions of the occurrence of fatal strangulation events are limited, both in South Africa and elsewhere in the world. The current study describes the extent and distribution of female and male homicidal strangulation in the City of Johannesburg for the period 2001–2010. The study is a register-based cross sectional study of homicidal strangulation that draws on data recorded by the National Injury Mortality Surveillance System. Crude, unadjusted strangulation rates, and proportions of strangulation across specific circumstances of occurrence were computed for each year and aggregated in some instances. Results indicated fatal strangulation to be the fourth leading cause of homicide in the City of Johannesburg. A total of 334 strangulation homicides were recorded, representing an average annual strangulation homicide rate of 0.90 per 100,000 population. Gender disproportionality in victimisation was reflected in the average annual rate of 1.03 per 100,000 population for females and 0.74 per 100,000 population for males. The highest rates were recorded among the elderly, and amongst coloured females and white males. Temporal and spatial descriptions indicated that victims were strangled primarily during the day, over the weekday period, and in private locations. When the scene of death was considered by race and age group, results indicated the victimisation of white females and males in private places, and the elderly in private settings. The majority of strangulation victims tested negative for alcohol. The results highlight the need for multi-level prevention strategies that target specific risk groups and situations.

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1. Introduction

The magnitude of fatal violence presents as an intractable public, psycho-social and social policy concern. Homicide results in innumerable health, social and economic costs, reverberating across every level of society, and eroding the ideals of justice, freedom and security. The global average homicide rate is 6.9 per 100,000, with Africa's estimated rate of 17.4 per 100,000 the highest among the regions.[1] Violence in South Africa contributes significantly to the country's burden of mortality, and physical, psychological and social morbidity. After HIV/AIDS, violence and unintentional injuries combined represent the second foremost cause of death and disability-adjusted life years (DALYs) in the country.[2] South Africa's overall injury death rate of 157.8 per 100,000 is driven by interpersonal violence, reported to be four and a half times the global proportion.[3] Burden of disease estimates for South Africa (64.8 per 100,000) reveal markedly elevated homicide rates relative to other regions of the world.[4] Although South Africa's total female homicide rate declined from 24.7 per 100,000 in 1999 to 12.9 per 100,000 in 2009,[5] the current figure remains considerably higher than the estimated global rate of 4.0 per 100,000 female population,[6] and underlines the persisting and inordinate problem of violence against women.[7] Equally striking is the research evidence that points to the disproportionate representation of males as victims of lethal violence.[2,8,9] Findings demonstrate that homicide is a significant contributor to years of life lost for South African males,[10] and among the top five causes of male mortality in the country.[11] Within this context, there is growing concern about the mortality of both South African men and women from the different external causes of death, including strangulation.

Strangulation is a form of mechanical asphyxia that is caused by constriction of the neck, and involves several mechanisms of death, including occlusion of the airway, resulting in hypoxia; occlusion of

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the neck vessels or compression of the carotid arteries, leading to cerebral ischaemia; and carotid sinus reflex, leading to cardiac arrest.[12] Homicidal strangulation involves either ligature or manual strangulation, with the former reported as the more frequently recorded method of asphyxial homicide.[13–17] Research on homicidal strangulation has largely been undertaken from a legal and forensic medicine perspective, with a smaller number of studies located within victimology studies. Within this corpus of literature, studies have focused on post-mortem examinations of victims of strangulation fatalities [e.g.,[15,18–20]] and epidemiological profiles of strangulation deaths [e.g.,[16,17,21]]. Others have provided reviews of attempted strangulation, particularly in the context of intimate partner violence [e.g.,[22–30]]. Some research has focused on recommendations for the screening of risk, improved medical, social and legal interventions to mitigate risk, and the prevention of fatal and non-fatal strangulation [e.g.[21,22,24,26–28,30]].

The available, albeit vastly limited, research evidence on homicidal strangulation suggests that although a rare occurrence in the context of mortality, strangulation in fact presents as a relatively common mechanism of intentional fatal injury. Based on a review of research from Japan, Canada, Scandinavia and Scotland, Häkkänen[31] concluded that fatal strangulation accounts for an estimated 10–20% of all homicide deaths in a range of countries, thereby constituting a significant proportion of violent deaths. Epidemiological descriptions of homicidal strangulation are available for both high-income contexts, such as Finland, Norway, Denmark and the United Kingdom [e.g.,[31–34]], as well as low-to middle-income settings, such as India, Jordan, Turkey and South Africa [e.g.,[13,17,18,21,35,36]]. Research shows marked variation in homicidal asphyxia patterns between females and males, with selected studies on fatal strangulation reporting a higher female to male ratio [e.g.,[16,22,34,36–40]], and others establishing a significant male representation among strangulation victims [e.g.[15,17,32]]. Distinct age differences characterise the trends in fatal strangulation victimisation. Peaks in age-related homicidal strangulation rates have been recorded for victims aged 20–30 year old, 30–40 year olds, victims over 60 year old, as well as 5–18 year olds in the case of the paediatric and adolescent victim sub-group [e.g.[16,17,32,34,36,41,42]]. The victim's domestic context has been more consistently identified as the primary crime scene [e.g.,[21,32–34,36]]. In the context of female homicidal strangulation, this finding has been cited in support of available records and hypotheses that label the victim–perpetrator relationship as primarily intimate.[32–34,37,40,43] In contrast, the findings of a South African study on injury patterns in female homicide victims indicated that in 1999 strangulation deaths among women 14 years and older were linked to non-intimate partners.[44]

The preceding literature review suggests that investigations on the epidemiology of fatal strangulation have been primarily small-scale in nature. Existing studies are largely limited to initial descriptions of incidence and circumstances, thereby limiting explanations of the phenomenon and conclusions that may be derived. The investigation of female and male homicidal strangulation in South Africa, and elsewhere too, is critical not only to address the evidence gap in the extant literature, but also to make visible the utilisation of strangulation as a method to commit fatal violence. Reliable and accurate records of the phenomenon will extend the compass of national and international research on the subject, enabling context-specific interpretations, within-country and cross-national comparisons, and the tracing of longitudinal trends. The current study also represents a valuable source of knowledge for the development of interventions aimed at reducing the burden of mortality from strangulation, as well as to attempts to secure essential resources required to mitigate and prevent lethal strangulation. The initial descriptions emerging from this study are considered in relation to notions of vulnerability as they concern characteristics of person, time, place and alcohol consumption.

The current study investigated the extent and distribution of female and male homicidal strangulation in the City of Johannesburg for the period 2001–2010. The study addressed the following four questions:

1. What is the incidence of female and male homicidal strangulation relative to the other leading causes of homicide in the City of Johannesburg?
2. What are the cause-specific rates for female and male homicidal strangulation relative to the cause-specific rates for the other leading causes of homicide in the City of Johannesburg?
3. What are the age-specific and race-specific rates for female and male homicidal strangulation in the City of Johannesburg?
4. What are the characteristics of female and male homicidal strangulation, by person, time, place and blood alcohol concentration (BAC), in the City of Johannesburg?

2. Materials and methods

The study is a register-based cross sectional study of homicidal strangulation that drew on data recorded by the National Injury Mortality Surveillance System (NIMSS) for the City of Johannesburg over the period 2001–2010.

2.1. Research context

The City of Johannesburg was chosen for the current study since it accounts for the greatest proportion of the South African urban population,[45] among the highest relative number of overall homicides,[46,47] and the availability of systematically collected data on homicidal strangulation.[48] The City of Johannesburg is the provincial capital of Gauteng, and one of eight metropolitan municipalities in South Africa. Violence is the leading cause of non-natural death in Gauteng, represented by an overall rate of 34.3 deaths per 100,000 population.[48] According to the 2011 South African National Census, the City of Johannesburg is estimated to have a total population of 4.4 million.[49] The City has an estimated sex ratio of 100.70 (males per 100 females).[50] Approximately 73% of the City's population is concentrated in the 15–64 years age range.[49] The legacy of apartheid continues to have an impact on the City of Johannesburg. Historical social, geographical and economic inequities, together with current social and economic challenges have reportedly manifested in high levels of crime, violence and other forms of harm.[51]

2.2. Data

All fatal strangulation cases were extracted from the NIMSS, together with firearm, sharp object and blunt object homicide cases among both females and males for the period 2001–2010; these mechanisms of death represent the four leading causes of homicide in the City of Johannesburg and in South Africa. The NIMSS is a mortuary surveillance system that uses findings from medico-forensic investigative procedures at state medico-legal laboratories and forensic chemistry laboratories to collate and disseminate descriptive epidemiological information on deaths due to non-natural causes that, in terms of South African legislation, are subject to medico-legal post-mortem investigation.[52] The NIMSS is coordinated by the Violence, Injury and Peace Research Unit (VIPRU), which is co-directed by the South African Medical Research Council (SAMRC) and the University of South Africa (UNISA), and is supported by the South African Department of Health (DoH). It collects

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