



## ORIGINAL ARTICLE

## The burden of intentional self-poisoning on a district-level public Hospital in Cape Town, South Africa



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## A B S T R A C T

**Introduction:** Intentional self-poisoning is a significant part of the toxicological burden experienced by emergency centres. The aim of this study was to describe all adults presenting with intentional self-poisoning over a six-month period to the resuscitation unit of Khayelitsha Hospital, Cape Town.

**Methods:** Adult patients with a diagnosis of intentional self-poisoning between 1 November 2014 and 30 April 2015 were retrospectively analysed after eligible patients were obtained from the Khayelitsha Hospital Emergency Centre database. Missing data and variables not initially captured in the database were retrospectively collected by means of a chart review. Summary statistics were used to describe all variables.

**Results:** A total of 192 patients were included in the analysis. The mean age was 27.3 years with the majority being female (n = 132, 68.8%). HIV-infection was a comorbidity in 39 (20.3%) patients, while 13 (6.8%) previously attempted suicide. Presentations per day of the week were almost equally distributed while most patients presented after conventional office hours (n = 152, 79.2%), were transported from home (n = 124, 64.6%) and arrived by ambulance (n = 126, 65.6%). Patients spend a median time of 3h37m in the resuscitation unit (interquartile range 1 h 45 m–7 h 00 m; maximum 65 h 49 m). Patient acuity on admission was mostly low according to both the Triage Early Warning Score (non-urgent n = 100, 52.1%) and the Poison Severity Score (minor severity n = 107, 55.7%). Pharmaceuticals were the most common type of toxin ingested (261/343, 76.1%), with paracetamol the most frequently ingested toxin (n = 48, 25.0%). Eleven patients (5.7%) were intubated, 27 (14.1%) received N-acetylcysteine, and 18 (9.4%) received benzodiazepines. Fourteen (7.3%) patients were transferred to a higher level of care and four deaths (2%) were reported.

**Discussion:** Intentional self-poisoning patients place a significant burden on emergency centres. The high percentage of low-grade acuity patients managed in a high-acuity area is of concern and should be investigated further.

## African relevance

- Self-inflicted drug overdose occurs frequently.
- Paracetamol is the drug of choice.
- The low-grade acuity of most toxicology patients raises the question of over triaging.

## Introduction

Poisoning is worldwide a common cause for morbidity and mortality. The World Health Organization (WHO) estimated that 108 000

people died from poisoning in 2015 [1]. Poisoned patients often present to emergency centres; the incidence in emergency centres in international non-African facilities can be as high as 10% [2]. A similar trend has been witnessed in Africa, where 1.9% of emergency centre visits in Botswana and 2.4% in western Kenya related to poisoning [3,4].

Intentional self-poisoning occurs globally across all levels of income [5,6]. These self-harm episodes are not accidents; they are deliberate actions taken by patients to escape from complex and distressing life circumstances [7]. A population-based cohort study also indicated that intentional self-poisoning is a strong predictor of subsequent suicide (23%) and even premature death [8].

Peer review under responsibility of African Federation for Emergency Medicine.

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<https://doi.org/10.1016/j.afjem.2018.03.002>

Received 30 June 2017; Received in revised form 14 February 2018; Accepted 28 March 2018

Available online 05 May 2018

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Intentional self-harm in South Africa during 2015 ranked 6th of all non-natural deaths; 0.9% of non-natural deaths and 0.1% of all causes of death [9]. However, this number must be interpreted with caution as nearly three-quarters of non-natural causes of death were not adequately classified. Furthermore, this number also includes trauma-related causes of self-harm and are not only due to poisoning. Specific data on intentional self-poisoning in South African adults are thus limited. A one-year review of Tygerberg Poison Information Centre consultations indicated that 61% of adult cases were due to intentional exposures [10]. This trend was even higher (81%) in adults admitted with acute poisoning to the Tygerberg Academic Hospital, Cape Town [11]. What's more, 8% of all adult admissions to Khayelitsha Hospital (another Cape Town hospital) were as a result of intentional self-poisoning [12]. The percentage increased substantially to 23% in patients between the ages of 13 and 18 years [12]. The high incidence of toxicology-related cases warranted a more in-depth review of these patients and subsequently led to this study.

South Africa is laden with a quadruple burden of disease (i.e., high HIV/Tuberculosis burden; high maternal and child mortality; high levels of violence and injuries; and a mounting burden of non-communicable diseases) [13] which often distracts the focus from other health problems. More information is needed to deepen the understanding of the burden that toxicological presentations have on South African health services. Additionally, areas need to be identified that require further study and offer potential solutions to improve the quality of care offered to these patients. The aim of this study was to describe all intentional self-poisoning exposures in adults that presented to the resuscitation unit of Khayelitsha Hospital, Cape Town over a six-month period.

## Methods

A retrospective analysis of a prospectively collected observational database combined with a retrospective chart review to include additional variables was performed. The study was approved by the Stellenbosch University Health Research Ethics Committee (Ref: N14/08/102A) and included a waiver of informed consent. The waiver of consent was granted on the basis that 1) the retrospective nature of the study made obtaining consent impractical; 2) all personal and identifiable information were removed and the data immediately coded after the collection thereof; and 3) there was no interest in individual patients, only in the specific toxins they took and the effect thereof.

Primary level health services in South Africa are provided through local clinics and 24-h community health centres. Hospitals provide higher-level services and are divided into district (level 1), regional (level 2), or tertiary/central (level 3) hospitals [14]. District hospitals provide basic diagnostic and therapeutic services and specialist services are not always available [14].

Khayelitsha Hospital is a 240-bed medical facility on the outskirts of the Cape Town Metropole. It provides district-level health care to approximately 500 000–1 500 000 people in the Khayelitsha area [15]. The emergency centre manages about 30 000 patients per annum and has a 30% admission rate (personal communication: Dr S Lahri, November 2016). Consultant emergency physicians are typically present from 08 h 00 to 16 h 00 on weekdays with telephonic assistance outside these hours. The resuscitation unit has five monitored beds, four adult and one paediatric cot, and forms part of the emergency centre. Formal admission criteria to the resuscitation unit does not exist and patients with a high acuity score according to the South African Triage Scale are preferably managed within the resuscitation unit [16].

An observational electronic database (The Khayelitsha Hospital Emergency Centre database) was established on 1 November 2014. Data are prospectively collected on all patients managed within the resuscitation area by means of a tailored smartphone application as previously described [12].

All adult patients ( $\geq 13$  years) with a diagnosis of intentional self-

poisoning were extracted from the database for a six-month period (1 November 2014 until 30 April 2015).

Key variables collected were age, gender, acuity, toxin exposure (route, severity, toxin), diagnostic tests performed and interventions received in the resuscitation unit, time spent in the resuscitation unit, disposition from the resuscitation unit, and in-hospital mortality. Missing data and variables not initially captured in the database were retrospectively collected by means of a chart review.

Patient acuity was measured using the Triage Early Warning Score (TEWS) as part of the South African Triage Scale [16]. The TEWS is a composite score representing physiologic parameters at triage [16]. There are different age appropriate versions and it categorises patients as Emergency (Red), Very urgent (Orange), Urgent (Yellow), and Non-urgent (Green) [16].

The Poisoning Severity Score was retrospectively calculated and used to determine the severity of poisoning on admission [17]. The Poisoning Severity Score can be used in all age groups and takes the observed clinical symptoms and signs into account [17]. It grades the severity of poisoning as None (no symptoms or signs related to poisoning), Minor (mild, transient and spontaneously resolving symptoms), Moderate (pronounced or prolonged symptoms), and Severe (severe or life-threatening symptoms) [17].

Means to identify the alleged toxins were left to the treating doctors' discretion. Various methods were used and included obtaining a clinical history from patients themselves, relatives or friends; gaining information by scrutinising the containers of the alleged poisons; and sending samples of body fluids to the toxicology laboratory for identification. Individual agents were categorised into toxin type and toxin group; e.g., paracetamol (acetaminophen) was categorised as toxin type: pharmaceuticals, toxin group: analgesics and antipyretics.

Patients with partially missing data were included for analysis except where analyses involved the specific missing variable. Summary statistics were used to describe all variables.

## Results

A total of 201 patients were extracted from the database ( $n = 2324$ ). Nine were further excluded due to being incorrectly labelled as intentional self-poisoning ( $n = 5$ ), driving under the influence of alcohol ( $n = 3$ ), and missing folder ( $n = 1$ ), thus 192 (8.3% incidence) were included in the analysis.

Intentional self-poisoning mostly occurred in females ( $n = 132$ , 68.8%) and in younger patients (mean age 27.3 yrs (standard deviation = 10.7 yrs),  $< 25$  yrs  $n = 91$  (47.4%),  $25$ – $35$  yrs  $n = 65$  (33.9%),  $> 35$  yrs  $n = 36$  (18.8%)). The exposure route was orally in all patients ( $n = 192$ ; 100%). HIV-infection was the most common comorbidity ( $n = 39$ , 20.3%), followed by psychiatric illness ( $n = 14$ ; 7.3%), pregnancy ( $n = 12$ ; 6.3%), and neurological disease ( $n = 5$ ; 2.6%). Thirteen patients (6.8%) had previous suicide attempts.

Most patients ( $n = 152$ ; 79.2%) presented outside office hours (office hours i.e., Monday to Friday 08 h 00–16 h 00). Presentations per day of the week were almost equally distributed, while most patients were transported from home ( $n = 124$ ; 64.6%) and arrived by ambulance ( $n = 126$ ; 65.6%) (Table 1). The median time patients spent in the resuscitation unit was 3 h 37 m (interquartile range (IQR) 1 h 45 m–7 h 00 m). This finding is similar to previously reported times of all patients in the same unit (median 3 h 15 m, IQR 1 h 10 m–6 h 20 m) [12]. Four patients stayed more than 24 h in the unit (maximum time = 65 h 49 m).

Most patients were categorised by TEWS as non-urgent ( $n = 100$ ; 52.1%) and by the Poison Severity Score as minor severity ( $n = 107$ ; 55.7%) (Table 1).

A total of 343 toxins were ingested. The maximum number of toxins ingested by one patient was eight (one toxin:  $n = 108$ , 56.3%; two toxins:  $n = 46$ , 24.0%, three or more toxins:  $n = 38$ , 19.8%). Pharmaceuticals were the most common type of toxin ingested (261/

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