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The profile of deliberate self-poisoning cases presenting at the emergency department of Pelonomi Regional Hospital

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The Profile of Deliberate Self-poisoning Cases presenting at the Emergency Department of Pelonomi Regional Hospital

By

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Submitted in partial fulfillment of the requirement for the degree

Master of Science in Emergency Medicine

in the

Faculty of Health Sciences

at the

University of the Witwatersrand

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DECLARATION

I, Matthew Olukayode Abiodun Benedict, declare that this research report is my own work. It is being submitted for the degree, Master of Science in Medicine in Emergency Medicine in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

Signature…… Date……

ABSTRACT

The Profile of Deliberate Self-poisoning Cases presenting at the Emergency Department of Pelonomi Regional Hospital

Background

Deliberate self-poisoning (DSP) remains a common method employed for suicide worldwide. Despite its frequent occurrence and the high cost required in its management, only few studies have been carried out on this subject in South Africa. Inadequate research into DSP in South Africa is a great concern as this may inadvertently result in an inadequate knowledge of health professionals on the general approach to victims presenting at emergency departments. This may consequently result in a poor clinical outcome of these cases. This study was aimed at determining the demographics of DSP cases presenting to the emergency department (ED) of Pelonomi hospital and also to enquire into the drugs/agents commonly used, reasons for DSP and the clinical outcome of these cases.

Method

This was a retrospective, descriptive study which was carried out by going through the hospital clinical records covering a period of eighteen months (1st January 2010 – 30th June 2011). The demographics and deliberate self-poisoning-related information were then collected, using a data collection form. The data was thereafter analysed by using descriptive statistics, calculated for continuous data. Frequencies and percentages were calculated for categorical data.

Results

Of the 212 DSP cases reviewed, 66% were female. Most patients (86.8%) were single and 65.6% were unemployed. DSP occurred more in the age-group of 20-39 years (68.8%). Majority of the DSP cases (84.4%) occurred in areas associated with poor socio-economic status.

Paracetamol was the drug used by majority of these patients (21.7%) for DSP. Other common agents/drugs used were antidepressants (9.4%), antiretrovirals (ARVs) (9.9%) and household chemicals (19.3%). 85 patients (40.1%) took more than one drug/agent.
Out of the 81 patients who had the reason for their poisoning stated, 40 patients had relationship disharmony (32 unmarried, 8 married). 15 patients had family issues which mainly resulted from conflicts with parents and grandparents. The medical reasons found amongst 5 patients were HIV infection, cancer and dental problems. Unemployment and post traumatic stress disorder following rape were the other reasons for DSP. The psychosocial problems of 10 patients were not specified.
Majority of the patients (59.9%) were discharged in stable conditions. Low GCS (≤8) and hypothermia were common clinical features occurring amongst patients that got admitted.

Conclusion

DSP is still a common phenomenon, majorly amongst females in the age-group of 20-39 years, with poor quality of life. Relationship disharmony is the most common reason for poisoning. Drug/agents used can only be curtailed to a minimal extent. Prevention through early detection of vulnerable patients and early psychological management should be our goal.

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LIST OF ABBREVIATIONS

ARVs – Anti-retrovirals

CEO – Chief executive officer

CNS – Central nervous system

DSH – Deliberate self-harm

DSP – Deliberate self-poisoning

ED – Emergency department

GI – Gastro-intestinal

HIV – Human immunodeficiency virus

HREC – Human research ethics committee

PTSD – Post-traumatic stress disorder

SPSS – Statistical Package of Social Sciences

WHO – World health organization

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

"Poisoning refers to the development of dose-related adverse effects following exposure to chemicals, drugs, or other xenobiotics through inhalation, ingestion, skin or eye contact, or inoculation.[1] The dose makes the poison[1,2]." Paracelsus, in the 18th century, was the first person who related poisoning to the dosage of the toxic substance. According to him, "all substances are poisons; there is none which is not a poison. The right dose differentiates a poison from a remedy''.[3] Deliberate self-poisoning is therefore the intentional over dosage on drugs/agents in an attempt to harm oneself.[4,5]

Poisoning, directly or indirectly has been found to be responsible for more than 1 million illnesses worldwide annually.[6] This however, is only an estimate, as many cases of poisoning go unreported.[6]

In South Africa, about 17% of the total ward admission of children is due to acute poisoning. About 80% of these cases of poisoning are accidental, and children less than 10 years old are the victims. Poisoning in these cases is often due to exposure to or ingestion of household chemicals (e.g. paraffin) and agrochemicals[7]. Accidental poisoning in adults is often in the form of industrial exposure and iatrogenic poisoning resulting from drug interactions, incorrect prescribing and patients' misunderstanding of their medications.[1]

Poisoning could be intentional (e.g. deliberate self poisoning and homicide) or unintentional, as mentioned above. For the purpose of this study, focus will be on deliberate self-poisoning (DSP). This is because DSP is of high incidence in parts of the developing world where the toxicity of available poisons coupled with sparse medical facilities increases the likelihood for morbidity/mortality.[6]

Deliberate self-poisoning (DSP) has been defined by the World Health Organization (WHO) multicenter study on parasuicide as an act with a nonfatal outcome in which an individual deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage.[4] DSP and deliberate self-injury belong under a common class referred to as deliberate self-harm.[5]

DSP accounts for about 100,000 hospital admissions in England and Wales every year, with a rising incidence.[8] About 10% of the workload of emergency department and 20% of workload in the medical departments in the United Kingdom are related to self poisoning[9].

Deliberate self-poisoning is typically employed by individuals, (most commonly single females) struggling with psycho-social challenges in order to gain attention, express distress or to get revenge, and not necessarily to end their lives.[10]

The few studies done in South Africa and some other parts of Africa have shown paracetamol, antibiotics, non-steroidal anti-inflammatory drugs, anti-hypertension drugs, benzodiazepines and organophosphate containing pesticide to be some of the common agents used for self poisoning.[11,12]

Clinical presentation of DSP cases in the emergency department ranges from an ambulant, asymptomatic patient, to a comatose patient. Time interval between the onset of poisoning and presentation at the emergency department, type, dose, potency, multiplicity of poison/drug used and association with alcohol intake are factors which often determine the clinical presentation and outcome of DSP patients presenting at the emergency department.[13,14,15]

The goal in the management of DSP in the emergency department is to resuscitate the unstable patient by utilizing Standard Advanced Life Support Principles, determine the poison used, prevent or reduce the amount of poison absorbed, give the appropriate antidote and refer for further and/or supportive management such as rendered in the medical wards, intensive care units and psychiatric or psychology departments. In cases where the poison used is unknown, thorough physical examination becomes very important in order to detect certain known toxic syndromes.

Toxicology screening is a pharmacological investigation carried out on patients (blood and urine samples) in order to confirm the presence of certain drugs and their concentrations in the body; urine samples are collected from patients suspected to have taken drugs of abuse while blood samples are collected when drugs like paracetamol, carbamazepine and tricyclic antidepressants are suspected to have been used. Both samples are collected for complete toxicology screening when in doubt of the drug used.

Other laboratory investigations like liver function tests, urea & electrolytes and clotting profiles are used to rule out the presence of complications such as hepatotoxicity, renal failure etc.

In summary, DSP is an important, relatively common acute medical presentation and the clinical outcome is a function of the poison used (dose, potency, multiple agent etc), association with alcohol use, time interval between poisoning and presentation at the emergency department, competence of attending health professional and immediate availability of antidotes and other emergency equipment for intervention.

1.2 BACKGROUND TO THE STUDY

In a South African study, deliberate self-poisoning occurred commonly amongst black females of child-bearing age, belonging to the working class and residing in areas with greater likelihood for psycho-socio-economic problems.[12] Some of the problems in such residential areas include poor sewerage, bad roads, inadequate access to portable water and electricity. Other problems that may predispose to suicidal behaviours include unemployment, relationship/marital problems, unwanted pregnancies, post traumatic stress disorders, academic, health and financial problems.[16,17,18]

Death or complications, though not intended by most patients, may occur as a result of poor knowledge of the poison/drug used as well as delayed access to medical facilities.

Significant numbers of DSP cases could be prevented if more time is devoted to the appropriate assessment and counseling of patients presenting with psychological and socio-economical problems. More research into the profile of DSP cases will bring about the knowledge of the common drugs/agents used for poisoning. This will lead to a better and focused training of doctors, paramedics and other health professionals, particularly those working in the emergency department on the management of such poisoning cases.

Emergency medical personnel rendering pre-hospital care should be well informed before hand, of the available hospitals capable of rendering timeous and appropriate poisoning management. Doctors and other health care professionals working in the emergency department need to be conversant and competent in the management of poisoning. As such, there is need for continuous training and refresher courses for these health care professionals in the management of poisoning; protocols for the management of common poisoning should be available in conspicuous sites in the emergency department. Also, administrators of hospitals rendering care and management for poisoning cases would be made aware of the important antidotes and equipment to keep in stock on a regular and continuous basis in the emergency department. Finally, caution should be taken when prescribing drugs that are commonly used for poisoning.[12]

1.3 STATEMENT OF THE PROBLEM

Suicide, an increasing phenomenon worldwide occurs every 40 seconds and it has been found that the most common method engaged in suicide is deliberate self-poisoning.[17] Only few studies have been done on drug over-dosage in South Africa despite the common occurrence and the high cost required in the management of these cases.[12,18,19] Inadequate research into DSP, a phenomenon of great public health concern in South Africa may lead to poor knowledge of health professionals in the general approach to victims of DSP and may result in poor outcome.

CHAPTER TWO

RESEARCH METHODOLOGY

2.1 AIM AND OBJECTIVES

2.1.1 AIM

The aim of this study is to explore the profile of the various deliberate self-poisoning cases presenting at the emergency department of Pelonomi regional hospital, with a possible view to identifying patient groups amenable to earlier identification and intervention.

2.1.2 OBJECTIVES

- To find out the demographics of the patients presenting at Pelonomi emergency department with acute self poisoning.
- To establish the reason or circumstances surrounding these self poisoning cases.
- To determine the drug(s)/poison(s) used.
- To describe the clinical state of the patients presenting to Pelonomi emergency department with self poisoning cases.
- To determine the clinical outcome (including the presence or absence of complications) of patients presenting to Pelonomi emergency department with self poisoning.

2.2 INTRODUCTION

This chapter explains the research methods and approaches that were used to collect and analyse the data obtained for the purpose of this study. Thus, the approaches used to identify and examine the profile of deliberate self-poisoning cases presenting at the emergency department of Pelonomi regional hospital, as well as the method of data collection will be discussed in detail and explored.

2.3 METHODS

The empirical method used involved a descriptive, retrospective survey of selected cases of DSP at Pelonomi Hospital. This was conducted by identifying and reviewing all DSP cases that presented at the emergency department of Pelonomi Hospital during the period 1 January 2010 to 30 June 2011 (a period of 18 months). To achieve this aim, a documentary data collection form was compiled to capture the relevant information from patients' clinical files/ medical records. **The study population** comprised of all cases of DSP that presented at the emergency department of Pelonomi Regional Hospital, while **the sample size** consisted of all the cases that fell within the stipulated 18 months period.

Between 1 January 2010 to 30 June 2011, a total of **260** cases of DSP were entered into the emergency department register, but only **232** files were considered for the study as 28 files could not be found or traced by the records department and therefore, presumed misplaced or lost. Of the 232 files considered for the study, 20 files were significantly incomplete and therefore unsuitable for extraction of relevant information. These files were excluded from the study sample population thereby leaving **212** files to be analysed.

2.4 TARGET POPULATION

The target and study population comprised of all the cases of DSP that presented at the emergency department of Pelonomi Regional Hospital.

Pelonomi Regional Hospital has been chosen as the source for the target population, and therefore is the study area for this study. This Hospital was established over 47 years ago, during the apartheid dispensation, to serve the Black and Coloured communities of Bloemfontein and the Southern Free State. It is located in the vicinity of Mangaung (the old township of Bloemfontein for Black persons) and Heidedal (the old township for the Coloureds in Bloemfontein). Currently, the Hospital serves a population of about 750,000 people. It is the direct referral centre for the five neighbouring District Hospitals, from where patients are referred for specialized treatment in disciplines such as Internal medicine, Surgery, Obstetrics and Gynaecology, Orthopaedics, Paediatrics, Occupational health and Mental health. Furthermore, patients from twenty-six District Hospitals and five Regional Hospitals (including those from the Eastern Cape and Northern Cape Provinces) are referred to Pelonomi Hospital for more advanced treatment at the tertiary disciplines such as the Burns, Spinal and Trauma units, Centre of excellence for human immunodeficiency virus management, Renal dialysis, Maxillo-facial and Intensive care units.[20,21]

The rationale for selecting Pelonomi as the setting for this study is therefore the fact that it is the biggest regional hospital in the Free State, which provides emergency, secondary and tertiary services for communities in the Southern Free State.

2.5 SAMPLING

The study is retrospective by nature, which signifies that occurrences of DSP at a specified time period in the past will be the focus. To ensure the relevance of the study in the recent present, the past 18 months before the commencement of the study was

chosen as the specified time period to focus on, this being the period from 1 January 2010 to 30 June 2011.

Therefore, the sampling method employed by this study is the **population sampling method** which involves the inclusion of all the DSP cases that occurred at the specified time period of 1 January 2010 to 30 June 2011.

During the specified period of 1 January 2010 to 30 June 2011, **260** cases of DSP were recorded at the emergency department of Pelonomi Hospital. This was the sample size of the study. However, out of the 260 cases entered into the emergency department register, only 212 were included in the study as 28 files were deemed misplaced or lost from the records department and 20 files were significantly incomplete and therefore unsuitable for the study.

2.6 DATA COLLECTION

Documentary data forms were used to record all the relevant information extracted from the medical files of the selected patients who fell within the specified sample size. For the purpose of this study, each patient was assigned a code number and the data collected was kept on a password protected computer in order to ensure confidentiality.
These documentary data forms were designed to collect information on the patients' demographic details (gender, age, ethnicity, occupation, marital status) and facts related to the poisoning, such as the date the event occurred, why the patient deliberately poisoned him/ herself, the clinical state of the patient on presentation at the emergency department, the pre-hospital intervention, complications, the outcome of the case and the type of poison used. The few studies done in South Africa and some other parts of Africa have shown paracetamol, antibiotics, non-steroidal anti-inflammatory drugs, anti-hypertension drugs, benzodiazepines and organophosphate containing pesticide to be some of the common agents used for self poisoning.[11,12] The drugs used by these patients for DSP were determined by history and/or by carrying out toxicology screening on the DSP patients; urine samples were collected from patients

suspected to have taken drugs of abuse while blood samples were collected when drugs like paracetamol, carbamazepine and tricyclic antidepressants were used. Both samples were collected for complete toxicology screening when in doubt of the drug used.

The data forms were compiled with relevant input from the review of literature, and pre-tested on a selected group of patient files to ensure that the questions were balanced, correctly constructed, and that the crucial information would be obtained.

2.7 DATA ANALYSIS

Data from the completed documentary data forms were computer processed and analysed using Microsoft Excel 2010 and the Statistical Package of Social Sciences (SPSS). The interpretations were done using descriptive statistical tools such as percentages and frequency distributions tables. Also, cross-tabulation was used to show association between certain variables.

2.8 ETHICS

Before the commencement of the study, the approval of the Human Research Ethics Committee (HREC) of the Faculty of Health Sciences of the University of the Witwatersrand was sought; the ethics clearance number is **M120427** (Appendix 2). Thereafter, the approval of the Chief Executive Officer (CEO) of Pelonomi regional hospital was sought (see Appendix 3). The patients included in the study are anonymous and the data used did not reveal or suggest the identity of anyone.

CHAPTER THREE

LITERATURE REVIEW

3.1 INTRODUCTION

According to the World Health Organization's (WHO) global report on violence and health in 2002, suicide, a worldwide phenomenon on the rising trend, occurs every 40 seconds and an attempt occurs every 1-3 seconds. It has also been found that the most common method engaged in suicide is deliberate self-poisoning.[17] Self-poisoning is employed to gain attention, express distress or to get revenge; It is not just for the purpose of suicide.[10] Only few studies have been done on drug over-dosage in South Africa despite the common occurrence and the high cost required in the management of these cases.[12,18,19] A study[10] on self-poisoning by pesticide has shown that most patients reach the hospital alive; the survival of such patients therefore, to a large extent depends on the competence of the attending doctors and other health professionals in the emergency department. Therefore, inadequate research into DSP, a phenomenon of great public health concern in South Africa, may lead to poor knowledge of health professionals in the general approach to victims of DSP and this may result in poor outcome.[10] Good knowledge and awareness of health professionals on the common agents used for poisoning and the usual clinical features and outcome, through clinical research will incite them into acquiring proper diagnostic and management skills, thereby preventing unnecessary complications and death.[22]

In this chapter, the researcher has collated previous works done on deliberate self-poisoning, globally, nationally and locally. Information obtained from searches on the internet, University of the Witwatersrand's faculty of health sciences library, relevant articles and textbooks have been compiled in this literature review.

3.2 DEFINITION OF DELIBERATE SELF-POISONING (DSP)

Deliberate self-harm (DSH) is the term used to describe a situation where a person with apparent consciousness and willful intent performs painful, destructive and injurious acts upon his/her own body. DSP and deliberate self-injury are sub-types of DSH.[5]
DSP, according to the World Health Organization (WHO) multicenter study on parasuicide, is an act with a nonfatal outcome in which an individual deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage.[4]

3.3 OVERVIEW OF DSP

Deliberate self-poisoning (DSP) is the most common method of suicide attempt in developed countries and has been associated with significant morbidity and mortality.[13]

Between 2001 and 2004, 976,974 cases of DSP presented to the emergency departments in the United States of America, with an incidence rate of 248 per 100,000 amongst young White females.[23] In the United Kingdom, deliberate self-poisoning accounts for 170 000 presentations to the hospitals each year, with profound impact on the health of individual patients.[5,19] Self-poisoning accounts for 85–94% of cases of DSH and is therefore a major contributor to deaths from suicide.[19] In addition to the human cost, there is a substantial financial burden on the health services due to self-poisoning that is spread between emergency departments, acute medical units, critical care facilities, psychiatry and psychology services, social services and primary care.[19] For example, about 15-20% of the workload of medical units and 10% of the workload of the emergency department in the United Kingdom are due to self-poisoning.[9,24] In Australia, up to 5% of all general hospital admissions are related to DSP.[25,26] Deliberate self-poisoning cases represented 0.3% of the hospital admissions, and had a rate of 25.9 per 100,000 population in Fiji islands. [27] A study done in Oman (South-west Asia) showed DSP to be on an increasing trend. The incidence rate was 12.8 per 100,000 of the population in 1998.[28]

Deliberate self-poisoning appears to be a major public health issue in developing countries. In rural Sri Lanka, deliberate self-poisoning is one of the leading causes of hospital death.[22] Only few studies have been done in Africa, which specifically deals with the subject of DSP. A study done in Uganda on acute poisoning showed an equal prevalence of DSP amongst males and females.[29] Another study done in 2007 has shown a significant use of pesticide for self-poisoning in Uganda, Kenya, Nigeria, Zimbabwe and Ethiopia.[30]

Overdose is a common problem often seen in emergency departments in South Africa, yet, very few studies have been done on the profile of the overdose patient in this country.[12] Up to 8,000 South Africans commit suicide annually.[31] A subjective evaluation by doctors and nurses at Paarl Hospital indicated that there was a high incidence of patients who had overdosed presenting at this hospital.[12]
In Bloemfontein, 16.2% of the suicide cases investigated in the state mortuary were due to DSP.[31]

3.4 DEMOGRAPHIC FACTORS ASSOCIATED WITH DSP

Certain demographic factors have been associated with high risk for suicidal behaviours. Some of these factors are highlighted below:

Age: South African statistics have shown that suicide rates are highest among individuals between 25 and 39 years.[32]

Gender: Majority of the attempted suicide cases are documented to have occurred among the females whereas approximately 80% of successful suicide cases in South Africa occurred among the males.[33]

Sexual orientation: Increased suicidal risk has been associated with bisexuality and homosexuality amongst youths but this has not been substantiated amongst adults.[34]

Race: In a South African study done in 1999, the racial distribution of suicidal behavior was: 43.3% Black, 38.4% White, 15.9% Coloured and 2% Asian.[33]

Employment status and occupation: suicidal behavior has been shown to be more likely amongst the unemployed.[35,36] Also, individuals engaged in high-risk occupation (e.g police, anaethesiologists) are more likely to engage in suicidal behavior.[35]

Religious beliefs: suicide rates are lower among people with religious beliefs which prohibit suicide. Orthodox Roman Catholics have lower rates of suicide than other populations.[37]

Relationship status and living arrangements: Unmarried people and those living alone are more likely to be suicidal.[35] Also, social isolation raises the level of irritability, hostility and aggression which are associated with increased risk for suicide

In an American study, young white females between 15 to 19 years of age were at the highest risk of DSP.[23] In the United Kingdom, majority of the DSP cases were female, with a female: male ratio of 1.45: 1 and a median age of 32 years.[19] In an Australian study, about 50% of DSP cases were unmarried and 76% had their highest level of education at the secondary school. This study also showed an almost equal rate of DSP between the employed and unemployed.[25]

A study done in Oman (South-West Asia) revealed that 78% of the DSP cases were female. Also, majority of these DSP cases (53.1%) were unmarried.[28] The age-group with the highest incidence (54.1%) was 20-30 years. The most vulnerable group of people for DSH in this study were students, housewives and the unemployed. Also, in an Indian study, DSP was found to be more common in the female gender and the vulnerable age group is between 20-30 years.[38]

The few studies done in South Africa also showed more females to be involved in DSP compared to their male counterparts. The average age was 27.3 years.[12,17] The highest number of overdose cases per square kilometre occurred in Fairyland, an informal settlement in the Western Cape, with a high density of people and very poor socio-

economic circumstances.[12] The unemployment rate for patients between the ages of 18 and 65 in this study was 53.7%.[12]

In another study on suicidal behavior in black South Africans, most patients (male and female) were single and about 30% were students.[39] Furthermore, 16% of the suicide cases investigated in the state mortuary in Bloemfontein were due to DSP.[31] The majority of these cases occurred amongst blacks in the age-group 21-40 years and about 60% of these patients were unemployed.[31] In another study on parasuicide carried out in Bloemfontein, self-poisoning was the method employed in 90.7% of the cases. Majority of these cases involved females in the age-group of 18-31 years, with a median age of 22 years. About 63% of these patients were unmarried.[17]

3.5 REASONS FOR INDULGING IN DSP

Factors associated with DSP include psychological, socio-economic, cultural and health concerns. Frustration due to unemployment, breakdown of relationship amongst teenagers and young adults, marital problems and post traumatic stress disorder (e.g. rape) may lead to feelings of low self esteem, worthlessness and depression. In the same vein, the awareness and treatment burden of diseases like diabetes, hypertension, human immunodeficiency virus (HIV) infection and cancer may lead to depression; in the absence of urgent psychological and/or psychiatric intervention, ideation of self harm in the form of DSP may set in.

The following are known risk factors[40] for suicidal behaviours:

- **Inheritance** - Suicidal behaviours run in families and there is likelihood of their independent inheritance, of mental disorders. Heritability of suicide has been confirmed in twin studies. Family history of suicidal behaviour is an independent risk factor for attempting suicide.[40]
- **Major depression** - Amongst patients who complete suicide, depression is usually severe, and is often associated with insomnia, agitation, anxiety, appetite and weight loss, severe hopelessness, contrasting feelings of heavy guilt, worthlessness, thoughts of death and recurrent suicidal ideation.[40]

- **Bipolar disorders** - Suicide mortality is approximately 25 times higher amongst people with bipolar disorder when compared to the general population.[40]
- **Anxiety disorders** - Anxiety disorders, especially in adolescents and young adults, are associated with increased lifetime incidence of suicidal ideation and suicide attempts.[40]
- **Alcohol and other substance abuse** - All substance abuse disorders increase the risk of suicide. Long term use of alcohol, which is an intoxicating substance, has been associated with impairment of cognitive processes, increased impulsivity and aggression, and a low threshold for triggers of suicidal behaviour. Suicide victims who suffer from alcohol and other substance use disorders are often younger, male, divorced or separated. They often suffer from recent adverse life events, and they are also likely to be intoxicated at the time of the suicidal act.[40]
- **Schizophrenia** - The increased risk of suicide in schizophrenic patients is associated with previous depressive disorders, substance misuse or dependence, previous suicide attempts, agitation and motor restlessness, fear of mental disintegration, poor adherence to treatment and recent loss events. Schizophrenic patients living alone are at greater risk of suicide.[40]
- **Trauma –** Traumas are regarded as significant risk factors for suicide, especially when inflicted in the form of physical violence, mental and sexual abuse both in childhood and adulthood, bullying, victimization and exclusion at school or in the work place. Population-based studies and review of clinical studies have shown that patients who have experienced childhood trauma are more vulnerable to later social stress or adversity and are prone to suicidal behaviour.[40]
- **Stressful life events** - Negative life events such as loss, change in life situation, and different narcissistic injuries can act both as a catalyst and as a factor, which precipitates the development of the suicidal process. Traumatic loss includes not only death of, or separation from a partner, friend or a significant other; but also a loss of a national or cultural affiliation; loss of health; loss of possessions or autonomy due to hospitalization; loss of employment; study opportunities; home or financial position. Important transitions or changes in life situations such as:

entering or leaving periods of development, e.g. puberty, middle age, the menopause, or old age, can be a risk situation for vulnerable individuals. Unsolved relationship problems, family violence, particularly childhood physical and sexual abuse, insecure sexual orientation, especially in adolescence and young adults, increase the risk of attempted suicide and suicide in those with vulnerable personalities.[40]

- **Chronic illness** – Considerable connections have been proven to exist between suicidal behaviour and diseases of the CNS such as multiple sclerosis, Huntington's chorea, epilepsy, Parkinson's disease, migraine, brain and spinal cord lesions, as well as in patients with stroke, certain forms of cancer, diabetes, and chronic pain. Also, studies have shown increased risk of suicide in neurological disorders and cancer. Studies in cardiac, lung and other somatic disorders are fewer and the results are not conclusive. In children and adolescents, as in adults, other physical disorders associated with elevated suicide risk are: new onset diabetes mellitus, bronchial asthma, HIV, epilepsy and multiple sclerosis.[40]

In an Australian study,[16] 82% of deliberate self-poisoning patients were reported to have been exposed to one or more traumatic events in their lifetime and greater percentage of women, compared to their male counterparts were seriously physically attacked, assaulted, raped and experienced great shock because an untoward event happened to someone close to them.

A study done in Oman (South-West Asia) showed correlation between DSH and social destabilization and poverty.[28] This finding is well corroborated by a WHO declaration in 2001: “suicide rates are stable in periods of socio-economic stability but rise during periods of major economic changes.”[41] The top three causes of DSH in the same study done in Oman were family, social and marital problems. The most frequent conflict with family members relates to choice of spouse, inter-generational conflict and family disputes. These accounted for 30.9% of DSH cases. 15.4% of the DSH cases had social problems which involved poor rapport, social isolation and unresponsive social

network. 10.6% of the patients engaged in DSP as a result of poor achievement, poor insight/control over affairs of life. Chronic illness and bereavement (9.8%), marital disharmony (12.2%), financial problems (10.6%) and work-related stress (8.1%) were some of the other causes of DSH identified.[28]

In a study done in Bloemfontein (2005) on attempted suicide, the researchers attributed the high incidence of attempted suicide in the month of November to exams, work or other year-end stressors. In 2006, most attempted-suicide patients were admitted in the first quarter of the year and the reason for the high number of admissions at the beginning of 2006 may be associated with increased levels of stress after the holiday and festive season, less support from the family, loneliness and adaptation challenges of the New Year.[17]

The precipitating factors (in numerical order) found in the study were problematic relationships (55.4%); financial problems (22.9%); psychiatric problems (22.1%); arguments (19.8%); abuse (18.2%); feelings of low self-esteem, worthlessness, hopelessness or humiliation (16.7%); recent life changes (13.2%); unstable family life (9.3%); lack of social support (9.3%); scholastic problems (9.3%); isolation/rejection (8.9%); chronic medical condition (7.8%); substance use or abuse (7.1%); pregnancy (5.4%); imprisonment and involvement in crime (2.7%); problems at work (2.3%) and childhood trauma (2.3%). Many of the participants had more than one precipitating factor.[17]

An assessment of poverty, unemployment and inequality in the Free State in 2005 showed that poverty rates vary greatly between racial groups. While there is virtually no poverty recorded among Asian and White people, poverty estimate shoots up to 53.2% for Coloured people and 63.9% amongst Blacks. Poverty has also been shown to be a rural phenomenon, with the rural poverty rate estimated at 69.5% compared to 52.4% in urban areas.[42]

3.6 COMMON AGENTS/DRUGS USED FOR DSP

The choice of toxic substance as a method for DSP varies greatly between different countries; this seems to indicate more dependence on substance availability than its lethality. The choice of a toxic substance may predict the outcomes of a self-poisoning episode such as length of hospital stay and death.[13,14,15] Other factors like age, gender and ethnicity may affect the choice of substance used for DSP.

Also, the speed and the severity of poisoning depend on certain pharmacological properties of the drug: absorption, volume of distribution, cell membrane passage, protein binding etc[3]. Other pharmacological factors that might be associated with the outcome of DSP cases include the quantity, multiplicity of drugs and association of poisoning with alcohol intake or use of other substances of abuse (e.g. cannabis).

The agents implicated in DSP include household chemicals, modern medicine (prescription and over the counter), agrochemicals, drugs of abuse, traditional medicine and plants.[7] A report on the agents used for DSP in the United Kingdom reveals that paracetamol and paracetamol-containing compounds are implicated in about 50% of the cases.[8] Antidepressants were used in 20% of the cases and this high rate of antidepressant use has been correlated with an increase in the rate of its prescription. 3.6% of patients made use of opiates and 'drugs for kicks'. Non-ingestible poisons such as bleach and disinfectants were used for DSP in only about 1% of the patients.[8]
About 37% of the patients made use of a single category of drug/substance for DSP while 63% made use of substances from the combination of different classes (e.g analgesics taken with antidepressant). Patients in the younger age-group tend to take multiple agents, compared to the older patients. Differences have also been in the choice of drugs used for DSP amongst age-groups; while younger patients tend to make use of paracetamol, older patients made use of antidepressants and sedatives for self-poisoning.[8] Alcohol use in conjunction with self-poisoning was reported in 29% of DSP cases in a British study.[43]

In Oman, 26% of the patients made use of non-medicinal agents such as household detergents, organophosphate pesticides and solvents and perfumes for self-poisoning. Amongst the drugs used for DSP, non-steroidal analgesics such as paracetamol, ibruprofen and aspirin were implicated in about 41% of the cases.[28] Psychotropic drugs used for DSP were: diazepam (5.6%), fluoxetine (4.9%), amitriptyline (4.1%), carbamazepine (2.4%). Other agents used for DSP according to this study include glibenclamide, metronidazole, nadolol and cough expectorant.[28] Multiple agents were used in 18.7% of the cases and these agents included non-steroidal analgesics, solvents, detergents, psychotropic agents and cough expectorants.[28]

The study done on DSP in Paarl hospital showed that Sundays and Mondays had the highest incidence of overdoses presenting to the hospital and Fridays, the lowest. There was a downward trend of overdoses from Monday to Friday. The average number of cases of overdoses per day was 1.13 (range 0-4 per day).[12] The most common agents used were tricyclic antidepressants (20.4%) and paracetamol (20.4%). Multiple drugs were used in 42.3% of cases and 5% concurrently used alcohol.[12]

Study done on attempted suicide in Bloemfontein showed that most (66%) of the participants overdosed on prescription medication, 12% overdosed on household chemicals while 7% of the cases overdosed on other chemicals.[17] Most (19.7%) of the participants who overdosed used antidepressants. Analgesics were used in 8.2% of instances. The most commonly used household chemicals for self-poisoning were bleach (15.2%) and paraffin (36.4%).[17]

3.7 CLINICAL STATE OF PATIENTS ON PRESENTING AT THE ED

The clinical state of DSP patients presenting at the emergency department depends on the agent/drug/poison used and their pharmacological characteristics. The clinical features are functions of the mechanism of action of these agents i.e. adrenergic, cholinergic and centrally acting drugs. Certain pharmacokinetic characteristics of these agents such as half life, volume of distribution and bioavailability will also determine the onset and duration of the signs and symptoms of poisoning. Thus, patients presenting

soon after overdosing on drugs with long half lives need to be observed for appropriate duration of time in order to look out for the signs and symptoms which may manifest later.

Also, self-poisoning on multiple agents may result in the patient presenting with a constellation of non-specific clinical features which, amongst other reasons may be due to drug-drug interaction. Association of self-poisoning with alcohol use might also lead to the exaggeration of the clinical features of poisoning arising from the primary agent/drug.

The following are some drugs commonly used for DSP and the corresponding clinical features associated with their toxicities:

Paracetamol (Acetaminophen)

Paracetamol, also known as acetaminophen, is an analgesic that is commonly used around the world due to its relative safety and non-irritant characteristic to the gasric mucosa. Paracetamol has both analgesic and antipyretic properties.[19,44] In severe intoxication, the clinical features of progressive liver failure develops within 2 – 5 days[44]. Paracetamol is the drug commonly used in DSP in the United Kingdom. On the estimate, 70,000 cases present annually. Paracetamol poisoning is a frequent cause of acute liver failure often requiring liver transplantation in both the UK and the United States.[9,45] Ingestion of paracetamol in the excess of 7.5g is said to be substantial overdosage.[44]

Antibiotics

Amoxicillin, erythromycin, metronidazole, doxycycline, ciprofloxacin and cephalosporins are the antibiotics commonly prescribed as first line agents for the common infections affecting the respiratory tract, ear, nose and throat and genitourinary systems. Over dosage on antibiotics, most times only aggravate their usual side effects e.g. nausea, vomiting, diarrhea and hypersensitivity reactions. In rare occasions, renal and/or hepatic impairment and ototoxicity can occur.[44]

Anti-hypertensives

The common anti-hypertensives in use are hydrochlorothiazide, enalapril, nifedipine, atenolol and prazocin. Cases of over dosage on anti-hypertensives present with hypotension, palpitation, dizziness and confusion.[44]

Benzodiazepines

Benzodiazepines are often prescribed for sedation in anxiety disorders, insomnia, seizure management and as adjunct treatment in some psychiatric disorders. Examples of the common ones in use are diazepam, clonazepam and lorazepam. In toxic levels, patient may present with fatigue, drowsiness, ataxia and respiratory depression.[44]

Anti-epileptics

The common ones in use are phenobarbital, phenytoin, carbamazepine and valproic acid. When overdosed on, patient may present with ataxia, drowsiness, confusion, hallucination and gastrointestinal (GI) symptoms such as nausea, diarrhoea and vomiting.[44]

Anti-depressants

These drugs are employed in the management of different spectrum of depressive disorders. Examples of the common ones in use are amitriptyline (tricyclic derivative), fluoxetine and citalopram (selective serotonin re-uptake inhibitors). Features seen in the toxic patient depends on the mechanism of action of the drug used. Common features of toxicity include confusion, tremor, drowsiness, extrapyramidal symptoms and GI symptoms.[44]

Anti-retrovirals (ARVs)

These are the drugs used in the treatment of the human immunodeficiency virus (HIV) infection. The four available classes and their examples are:

- Nucleoside reverse transcriptase inhibitors (NRTIs) – lamivudine, tenofovir, stavudine, didanosine, zidovudine

- Non-nucleoside reverse transcriptase inhibitors (NNRTIs) – efavirenz and nevirapine
- Protease inhibitors (PIs) – saquinavir, indinavir and lopinavir, to mention but a few.
- Fusion inhibitor e.g. enfuvirtide

When overdosed on ARVs, patients may present with GI symptoms, headache, fever, fatigue. Complications that may arise include pancreatitis, elevated liver enzyme and lactic acidosis.[44]

In cases where the poison used is unknown, thorough physical examination becomes very important in order to detect certain known symptoms and signs associated with overdose of particular agents/drugs/poison (i.e. toxic syndromes), depending on their various pharmacological characteristics. Some of the common classes of drugs and their toxic syndromes are as follows:

ANTICHOLINERGIC

Common signs: Agitated delirium, often with visual hallucinations and mumbling speech, tachycardia, dry flushed skin, dilated pupils, myoclonus, mild pyrexia, urinary retention, decreased bowel sounds. Seizures and arrhythmias may occur in severe cases.

Common causes: Antihistamines, antiparkinsonism medication, amantadine, antipsychotics, antidepressants, antispasmodics, mydriatics, skeletal muscle relaxants, many plants, most notably *Datura stramonium* (also known as jimson weed).[46]

SYMPATHOMIMETIC

Common signs: Delusions, agitation, paranoia, tachycardia, hypertension, hyperpyrexia, diaphoresis, piloerection, slight mydriasis, hyperreflexia. Seizures and arrhythmias may occur in severe cases.

Common causes: Cocaine, amphetamine, methamphetamine (and derivatives), over-the-counter decongestants (phenylpropanolamine, ephedrine, pseudoephedrine).

Caffeine and theophylline overdoses cause similar findings secondary to catecholamine release.[46]

OPIATE/SEDATIVE

Common signs: Coma, respiratory depression, miosis, hypotension, bradycardia, hypothermia, acute lung injury, decreased bowel sounds, hyporeflexia and needle marks.

Common causes: Narcotics, barbiturates, benzodiazepines, glutethimide, methyprylon, methaqualone, meprobamate.[46]

CHOLINERGIC

Common signs: Confusion/central nervous system depression, weakness, salivation, lacrimation, urinary and fecal incontinence, GI cramping, emesis, diaphoresis, muscle fasciculations, pulmonary edema, miosis, bradycardia (or tachycardia), seizures.

Common causes: Organophosphate and carbamate insecticides, physostigmine, edrophonium.[46]

SEROTONIN

Common signs: Fever, tremor, incoordination, agitation, mental status changes, diaphoresis, myoclonus, diarrhea, rigidity.

Common causes: Fluoxetine, sertraline, paroxetine, venlafaxine; the preceding drugs in combination with monoamine oxidase inhibitors[46]

According to a study done in Denmark, abnormal vital signs and low GCS have been associated with an increased risk of mortality.[47]

For the purpose of this study, the Glasgow coma scale (GCS), blood pressure, pulse rate, respiratory rate and temperature will be employed as measure of the clinical state of the patients on presenting to the emergency department. This is because these are the common and consistent parameters regularly measured at the emergency departments. Normal ranges of these vital signs will be defined as follows:

Blood pressure: High (hypertension) – equal to or greater than 140/90mmhg; Low (hypotension) – less than 90/60mmHg[48,49].

Pulse: High (tachycardia) – more than 100 beats per minute; Low (bradycardia) – less than 60 beats per minute[48,49].

Respiratory rate: High – more than 20 cycles per minute; Low (bradypnoea) – less than 12 cycles per minute[48,49].

Temperature (axillary): High – greater than 37.5^0C; Low – less than 36.5^0C[48,49].

The **Glasgow coma scale (GCS)** is a measure of patients' level of consciousness. The normal value is 15, which is the highest score. Patients with scores ≤ 8 are often very unstable and as such, require intubation.

3.8 OUTCOME OF DSP CASES

Factors thought to determine the outcome of DSP cases include quantity, multiplicity and potency of the drug/agent, concomitant use of alcohol, time interval before seeking medical attention and the presence of medical co-morbidities.[24] Patients engaging the use of paraffin for DSP may come down with severe respiratory complication such as aspiration pneumonitis. Also, those employing the use of large doses of paracetamol or organophosphate often end up with severe organ-system complications; death might even ensue.

Delay in seeking medical attention may lead to greater amount of the drug/agent being absorbed into the system and thereby increasing the tendency for a worse outcome.

Also, patients with medical co-morbidity prior to DSP already have compromised organ-system. Such patients have greater tendency for failed resuscitation and an eventual poor outcome.

In the Oman study on DSP, 75.6% of the patients were admitted in the general medical wards, with 7.3% having unspecified complications.[28] In the study done in Paarl hospital

on overdose, most of the patients were kept overnight. Forty-three patients (21.9%) were discharged the same day and 44 (22.4%) patients were admitted to the medical ward. Only 13 patients (8.5%) were admitted to the high care unit.[12] For psycho-social assessments, 61(31%) patients were assessed by the social worker at the emergency department while 53 (27%) patients were given appointment to see the community social worker.[12]

CHAPTER FOUR

RESULTS

4.1 GENERAL INFORMATION/DEMOGRAPHICS

Table 1- General information/demographics

Variable	Frequency	Percentage
Gender		
Male	72	34
Female	140	66
Age group (years)		
Under 16	6	2.8
16-19	38	17.9
20-29	94	44.3
30-39	51	24.1
40-49	14	6.6
50-59	7	3.3
60-69	0	0
≥70	0	0
Not captured	2	0.9
Ethnic group		
Black	150	70.8
White	17	8.0
Coloured	18	8.5
Indian	0	0
Chinese/Asian	0	0
Not captured	27	12.7
Occupation		
Scholars	24	11.3
Students	17	8.0
Unemployed	139	65.6
Self-employed	1	0.5
Employed	31	14.6
Marital status		
Single	184	86.8
Married	21	9.9
Separated/divorced	4	1.9
Widowed	0	0
Not captured	3	1.4
Residential areas		
Informal settlements	102	48.1
Farms	4	1.9
Suburbs	14	6.6
Inner city	12	5.7
Township/location	77	36.3
Not captured	3	1.4

4.1.1 Gender

Of the 212 DSP cases reviewed, 140 (66%) were female, with an approximate female to male ratio of 2:1.

4.1.2 Age group

Ninety-four cases (44.3%) of the DSP cases occurred amongst the age group of 20-29 years. this was followed in rank by 51 cases (24.1%) occurring amongst the age group 30-39 years. Therefore, 146 cases (68.4%) of DSP occurred amongst the age group of 20-39 years.

4.1.3 Ethnic group

Most of the DSP cases occurred in the black race – 150 cases (70.8%). No Asian patient was represented in this study. The race of 27 patients (12.7%) was however not captured.

4.1.4 Occupation

One hundred and thirty-nine cases (65.6%) of DSP were unemployed. Also the result shows that 41 cases (19.3%) of DSP occurred amongst scholars and students.

This result shows that most patients presenting with DSP were unemployed. Also about a fifth of the DSP cases were scholars and student.

4.1.5 Marital status

One hundred and eighty-four cases (86.8%) of the DSP cases were single i.e. never married.

4.1.6 Residential area

One hundred and two DSP cases (48.1%) occurred in informal settlements while 77 cases (36.3%) occurred in the township. This result showed that the majority (84.4%, N=179) of the DSP occurred in areas associated with low socio-economic status.

Table 2 – Association between gender and residence type

	Residence						
	Township/location	*Inner city*	*Suburb*	*Farms*	*Informal settlement*	*Not captured*	*Total*
Gender							
Male	23	3	7	1	36	2	72
Female	**54**	9	7	3	**66**	1	140
Total	77	12	14	4	102	3	212

Table 3 – Association between age and residence type

	Residence						
	Township/location	*Inner city*	*Suburb*	*Farms*	*Informal settlements*	*Not captured*	*Total*
Age (years)							
<16	2	0	0	0	4	0	6
16-19	14	2	0	0	20	2	38
20-29	**39**	8	3	2	**42**	0	94
30-39	16	2	5	2	25	1	51
40-49	2	0	4	0	8	0	14
50-59	3	0	2	0	2	0	7
Not captured	1	0	0	0	1	0	2
Total	77	12	14	4	102	3	212

Table 4 – Association between age and occupation

	Occupation					
	Scholar	*Student*	*Unemployed*	*Self-employed*	*Employed*	*Total*
Age (years)						
<16	6	0	0	0	0	6
16-19	13	1	24	0	0	38
20-29	5	15	**65**	0	9	94
30-39	0	1	31	0	19	51
40-49	0	0	11	1	2	14
50-59	0	0	6	0	1	7
Not captured	0	0	2	0	0	2
Total	24	17	139	1	31	212

4.2 Poisoning-related information

4.2.1 Period of poisoning

Table 5 – period of poisoning

Variable	**Frequency**	**Percentage**
Period of poisoning		
Month		
January 2010	1	0.5
February 2010	22	10.5
March 2010	29	13.7
April 2010	24	11.3
May 2010	19	9.0
June 2010	17	8.0
July 2010	6	2.8
August 2010	18	8.5
September 2010	1	0.5
October 2010	No data	0
November 2010	14	6.6
December 2010	No data	0
January 2011	No data	0

February 2011	1	0.5
March 2011	19	9.0
April 2011	12	5.7
May 2011	17	8.0
June 2011	12	5.7
Day of the week		
Monday	39	18.4
Tuesday	32	15.1
Wednesday	31	14.6
Thursday	19	9.0
Friday	23	10.8
Saturday	34	16.0
Sunday	34	16.0

4.2.1.1 Month

Considering the 18 months study period, majority (13.7%, N=29) of the poisoning cases occurred in March 2010 while the lowest frequencies were observed in January 2010, September 2010 and February 2011.

4.2.1.2 Day of the week

Majority (18.4%, N=39) of the DSP occurred on Monday. However, 68 cases (32%) occurred on the weekend (Saturdays and Sundays).

4.2.2 Type of poison/drug used

Table 6 – type of poison/drug used

Variable	Frequency	Percentage
Poison/drug		
Paracetamol	46	21.7
Antihypertensives	7	3.3
Benzodiazepam	12	5.7
Antidepressants	20	9.4
Organophosphate	10	4.7
Antibiotics	9	4.2
Antiepileptics	8	3.8
Antiretroviral agents	21	9.9
Household chemicals	41	19.3
Others	38	17.9

Paracetamol was the drug used for DSP in majority (21.7%, N=46) of the cases. Household chemicals and “other” agents were used for DSP in 19.3% and 17.9% of the

cases respectively. Antiretrovirals (ARVs) were used by approximately 10% (N= 21) of the patients. The household chemicals used for DSP included paraffin, hair relaxer, furniture polish, after shave, bleach, brake fluid, turpentine, nail polish remover, toilet detergents and liquid dish washer. “Other” agents/drugs used for DSP included iron tablets, multivitamins, laxatives, rat poison (containing warfarin), oral hypoglycaemic agents, ear drops, metoclopramide, aspirin, simvastatin, actraphane injection, prednisolone, isoniazid and sucralfate.

4.2.3 Multiple drug/agent

Majority of the patients (59.9%, N=127) used only one drug/agent for DSP. Multiple agent/drug was used for DSP in 25% of the cases - 24 patients (11.3%) used three agents while 8 patients (3.8%) used more than three agents. In all, 40.1% of the patients used more than one drug/agent.

4.2.4 Association with alcohol

Only 13.2% (28) of the DSP cases were associated with alcohol use.

4.2.5 Toxicology screen

Toxicology screening was done in 50.9% (N=108). The test was either omitted or adjudged unnecessary for the other patients.

4.2.6 Positive agents detected from the toxicology screen

Cannabis use was associated with DSP in 3 patients (1.4%) while 4 patients (1.9%) used opiate. These were the only agents found in association with DSP. 101 patients took no other agent in additional to the primary poisoning agent.

4.2.7 Access to drug/poison

35.4% (N=75) of the patients took overdose of their own medication while 8% (N=17) overdosed on relatives' medication. Forty-one patients (19.36%) employed household chemical for DSP. Access to poison was not captured in the records of 70 patients (33%).

4.2.8 Reason for poisoning

Table 7: Reason for poisoning

Variable	Frequency	Percentage
Marital issues	8	9.9
Relationship issues (unmarried)	32	39.5
Psycho-social	10	12.3
Medical reasons	5	6.2
Family issues	15	18.5
Depression	7	8.6
Unemployment	2	2.5
Post traumatic stress disorder	2	2.5
Total	**81**	**100**

This information was absent from the clinical notes of 131 patients (61.7%). However, out of the 81 patients (38.3%) who had this information captured in their clinical notes, 40 had relationship disharmony (32 unmarried, 8 married). 15 patients had family issues which mainly resulted from conflicts with parents and grandparents. The medical reasons found amongst 5 patients were HIV infection, cancer and dental problems. The psychosocial problems of 10 patients were not specified.

4.2.9 Clinical state on presentation at the ED

Table 8 – clinical state on presentation at the ED

Variable	Frequency	Percentage
Glasgow coma scale		
15	175	82.5
9-14	17	8.0
≤8	5	2.4
Not captured	15	7.0
Blood pressure		
Normal	146	68.9
Low	15	7.1
High	48	22.6
Not captured	3	1.4
Pulse		
Normal	139	65.6
Low	8	3.8
High	61	28.8
Not captured	4	1.9
Respiratory rate		
Normal	115	54.2
Low	1	0.5
High	21	9.9
Not captured	75	35.4
Temperature		
Normal	139	65.6
Low	20	9.4
High	2	0.9
Not captured	51	24.1
Oxygen saturation		
Normal	191	90.1
Low	9	4.2
Not captured	12	5.7

Most of the patients had normal vital signs and Glasgow coma scale (GCS) of 15. GCS ≤8 was found in only 5 patients.

22.6% (N=48) of the patients had hypertension and 61 patients (28.8%) had tachycardia.

The respiratory rate and temperature were not in the clinical notes of 35.4% (N=75) and 24.1% (N=51) of the patients respectively.

CROSSTABS

Table 9 – Association between GCS and outcome

	Outcome				
	Discharged without complication	Admitted	Death	Not captured	Total
GCS					
15	116	52	1	6	175
9-14	2	12	1	2	17
≤8	0	5	0	0	5
Not captured	9	6	0	0	15
Total	**127**	**75**	**2**	**8**	**212**

Table 10 – Association between temperature and outcome

	Outcome				
	Discharged without complication	Admitted	Death	Not captured	Total
Temperature					
Normal	96	38	1	4	139
Low	7	11	0	2	20
High	2	0	0	0	2
Not captured	22	26	1	2	51
Total	**127**	**75**	**2**	**8**	**212**

4.2.10 Pre-hospital intervention

There was no documentation about pre-hospital intervention in most of the cases – 89.1% (N=188). However, 23 patients had emesis induced prior to presentation at the ED.

4.2.11 Medical co-morbidities

Table 11 – medical co-morbidities

Variable	Frequency	Percentage
Medical co-morbidity		
Hypertension	3	1.4
Depression	20	9.4
Epilepsy	6	2.8
HIV/AIDS	19	9
Other	14	6.6
None	150	70.7

Most of the patients (70.7%, N=150) had no medical co-morbidities. Depression and human immunodeficiency virus infection were the most common medical co-morbidities, with 9.4% (N=20) and 9% (N=19) respectively. Other medical co-morbidities found amongst these patients, accounting for 6.6% (N=14) of these patients include arthritis, cancer, peptic ulcer disease, asthma and unspecified psychiatric illness.

4.2.12 Outcome

About 60% (N=127) of the patients were discharged without any complication, 35.4% (N=75) were admitted and 2 patients (0.9%) died. The outcome of 8 patients was not stated in their clinical notes. These patients probably absconded from the ED before a decision could be made about them.

4.2.13 Psychiatric/psychological referral

One hundred and sixty-six patients (78.3%) were referred for psychological evaluation while 38 (17.9%) patients were not.

4.2.14 Where admitted?

Sixty-five patients (30.6%) were admitted into the medical ward while 5 (2.4%) were admitted into the intensive care unit (ICU). Three patients were admitted into gynaecology ward and 2 patients, into surgical ward.

4.2.15 Deranged urea and creatinine

Over 60% of the DSP cases had normal urea and creatinine levels. Abnormalities were found in less than 2.5% of the cases. About 35% of the patients had no renal function test done. This was probably due to omission or test being adjudged unnecessary.

4.2.16 Deranged Liver function tests

About 54% of the patients had normal liver function tests. Abnormalities were found in about 7.5% of the cases. About 38% of the cases had no liver function test done. This may also be due to omission or the test being deemed unnecessary by the attending doctor.

CHAPTER FIVE

DISCUSSION

5.1 Demographics of DSP cases presenting at the emergency department of Pelonomi regional hospital

The higher incidence of DSP amongst females as shown in this study, is similar to previous studies done internationally [1,19,23,28] (America, UK, Oman), nationally[12] (Western Cape) and locally[17] (Bloemfontein). The female gender may therefore be more prone to DSP. However, men on the other hand generally tend to attempt suicide by employing much more dangerous and violent methods such as hanging and gunshot. More often than not, they succeed in killing themselves. This may be the reason why they are less represented in the statistics of DSP presenting to the ED.[17]

The age-group of 20-29 years accounts for the highest frequency of DSP (44.3%), followed by the age-group 30-39 years (24.1%).This result slightly differs from an American study,[23] where the rate of self-poisoning was found to be higher in the age-group of 15-19 years. Similar results were found in the UK,[19] where the ages of majority of the DSP cases were found to be less than 30 years. In the studies carried out in Oman and India;[28,38] DSP occurred in the age-group of 20-30 years. Also, median ages of 27.3 years and 22 years amongst self-poisoning cases in Paarl[12] (Western Cape) and Bloemfontein[17] respectively, reflect similarities to this study.

This study showed that DSP is most common amongst Blacks. It is uncertain why no Indian/Asian case was seen in this study. This may be as a result of the lost data or due to the preference of some patients to certain private hospitals; a study on the profile of DSP in these private hospitals might be beneficial in explaining this finding. Studies[28,38] done in some Asian countries have shown DSP to be of concern. Also, comparative studies[50,51] done in the UK on DSP and attempted suicide amongst different races (Asian, White and Black females) showed that DSP was most common amongst female Asian and least common amongst Black females. These, therefore show that DSP is

also a problem among the Asian population. The fact that they are not represented in this study might only be due to uncertain reasons.

According to census 2001,[53] the population distribution of Bloemfontein was as follows – White=65.01%, Black Africans=23.52%, Coloured=10.77% and Indian/Asian=0.70%. Based on this racial distribution and owing to the fact that Pelonomi hospital is situated in Bloemfontein, it is logical to expect a higher occurrence of DSP amongst the Whites. The reason for the apparent low representation of White patients with DSP may be due to the fact that many of the DSP cases came from Thaba Nchu, Botshabela, Rocklands etc, which are predominantly Black settlements in the neighbourhood of Bloemfontein.

One hundred and thirty-nine patients (65.6%) were unemployed (excluding scholars and students). Similar studies done in Bloemfontein[31] and Paarl (Western Cape),[12] showed high unemployment rates of 60% and 53.7% respectively in these patients. There is therefore a strong possibility of unemployment being an important predisposing factor to suicidal behaviours.

Scholars and students contributed to about 20% of the DSP cases. This may be due to certain problems peculiar to this group of people viz: relationship disharmony, unwanted pregnancies, academic stress etc. A similar result was found in a study done in Oman, where a higher incidence of DSH was found amongst the unemployed and students.[38] Also, in a previous South African study,[17] students were found to contribute to 30% of patients with suicidal behaviours.

86.7% of the DSP cases were single. This might be a reflection of cultural marital practices amongst the group of Black South Africans represented in this study. In contrast to this study, unmarried DSP cases were 45.6% in an Australian study[25] and 53.1% in an Oman (South-West Asia) study[28].

This result showed that the majority (84.4%) of the DSP occurred in areas associated with low socio-economic status (informal settlements and locations). An assessment of poverty, unemployment and inequality in the Free State in 2005 showed poverty to be a

rural phenomenon.[42] A similar result was found in a Western Cape study[12], where the highest number of overdose cases per square kilometre occurred in an informal settlement with a high density of people and very poor socio-economic circumstances.

In all, this study shows that the majority of the DSP cases occurred amongst the unemployed in the age-group 20-29 years (see Table 4), living in areas with poor socio-economic status (see Table 3). According to the data, 66% of the DSP cases were females, 70.8% were Black and 86.7% were single (see Table 1). It can therefore be deduced that the majority of these DSP cases might have been Black females who were single and unemployed, residing in areas with poor socio-economic status.

A South African study on the profile of parasuicide cases showed that women might be more sensitive to certain life stressors.[17] The age-group of 20-29 years falls within the working and reproductive age. This age-group is associated with pregnancy, child-bearing and up-bringing, single parenting, employment seeking, vulnerability to assault, abuse and rape. These stressors may predispose the affected women to depression and in the absence of adequate support services e.g. by community social workers, counselors or psychologists, suicidal ideation may set in.

5.2 Reason for DSP

The information regarding the reason for DSP was captured in the case records of only 81(38.3%) patients. This omission is thought to cause a major setback in the analysis and discussion of this important objective. The various reasons identified as the reason for DSP amongst these 81patients are: marital problems, relationship disharmony, psycho-social problems (unspecified), health concerns, family issues, depression and unemployment.

In a discussion with Natasha Burgess (M.A Clinical Psychology), a clinical psychologist in National district hospital, on the 3rd of May, 2012, the identified reasons for DSP, as listed in the paragraph above, are the most common psycho-socio-economic stressors

implicated in patients with suicidal behaviours in Bloemfontein. The group of patients having unspecified psycho-social reasons captured in their case records as the reason for DSP is therefore assumed to be composed of the other reasons listed in the paragraph above.

Most of the marital and relationship problems are as a result of misunderstanding, infidelity, unwanted pregnancies, sexual dissatisfaction, financial constraints, relationship breakdown/divorce/separation and the associated court verdict on the custody of the children arising from these relationships.

Inability to cope with the reality of some chronic and terminal medical conditions such as hypertension diabetes mellitus, HIV infection and cancers is often the cause of suicidal ideation in these patients. Also the burden accompanying these medical conditions e.g. pain, side effects of their treatment is overwhelming and unbearable to some patients.

Family issues as reasons for DSP were as a result of conflict/quarrel with relatives (parents, grandparents etc) mostly arising from disapproval of their boy/girl friends and unspecified family conflicts.

Post traumatic stress disorder as reasons for DSP in two patients in this study was as a result of rape.

In all, these findings are similar to the results of the previous studies done in Australia[16], Oman[28] and Bloemfontein[17], where similar reasons were associated with patients' suicidal behaviours.

5.3 Timing of DSP and Drugs/poisons/agents used

Considering the 18 months study period, majority (13.7%, N=29) of the poisoning cases occurred in March 2010 while the lowest frequencies were observed in January 2010, September 2010 and February 2011. No particular reason was identified for these discrepancies but it could be due to the availability of the DSP cases from the records department. For instance, no DSP cases were found for the months of October 2010,

December 2010 and January 2011. 32% of the poisoning occurred during the weekend (Saturday and Sunday). Inactivity and idleness associated with the weekends might have given room for deeper deliberation of these patients on their life stressors; the ensuing depressed state of mind may subsequently prompt suicidal attempt. This is somewhat similar to a study done in the Western Cape where Sundays and Mondays had the highest incidence of overdoses[12]. Also, this study showed that DSP occurred more during the first four months of the year. People generally tend to over-spend during the end-of-year holiday and festive period, such that thereafter, they find it difficult to cater for their usual monthly expenses during the first couple of months of the following year. Also, this period marks the beginning of a new academic session for scholars and students who might also be returning from home. Lack of coping strategies for their new academic hurdles, coupled with possible financial and psycho-social stressors from home may trigger self-poisoning ideation for attention seeking.

A study[17] done in Bloemfontein on attempted suicide showed that the increased rate noted in November 2005 might be due to exams, work or other year-end stressors. It was also noted that In 2006 (the same study), most attempted-suicide patients were admitted in the first quarter of the year and the reason for a high rate of attempted suicide presentation at this period of the year has been associated with increased levels of stress after the holiday and festive season, less support from the family, loneliness and adaptation challenges of the New Year.

Paracetamol, one of the most common over the counter medication, was the drug with the highest frequency of use (21.7%) for DSP in this study. This may be due to the fact that paracetamol is readily available and is used in most homes for the treatment of minor pains/aches and fever. A study done in the UK on DSP showed that paracetamol and paracetamol-containing compounds were implicated in about 50% of the cases,[8] while 41% of DSP cases made use of paracetamol and non-steroidal anti-inflammatory agents in an Oman study.[28]

The widespread use of antidepressants (9.4%) may imply that depression is common amongst DSP cases, owing to the fact that it is a prescription drug. This can be

substantiated by the fact that most patients overdosed on their medication (see 4.2.8). Also, when compared, the percentage of patients having depression as co-morbidity (Table 11) is the same as the percentage of patients who took antidepressant for DSP (Table 6). It is however acknowledged that these patients might have also used drugs belonging to their relatives, friends or someone else. A high rate (20%) of the use of Antidepressants for DSP in the UK has been correlated with an increase in the rate of its prescription[8]. In addition, household chemicals were used by a great percentage (19.3%) of the patients. Majority of these household agents/chemicals are readily available with little or no restrictions to their purchase. This, however differs a lot from findings in a similar study done in the UK where non-ingestible poisons such as bleach and disinfectants were used for DSP in only about 1% of the patients.[8]

About 10% of the patients used antiretrovirals (ARVs) for DSP. Approximately 1.4 million South Africans are on ARVs for the treatment of HIV infection and 2,205 centres are capable of administering ARVs[53]. The widespread availability of these drugs coupled with a high tendency for depression amongst these patient, might explain the reason for its use for DSP.

40.1% of the patients used more than one drug/agent. This is similar to a South African study[9] where 42.3% of the patients overdosed on more than one drug. On the contrary, 63% and 18.7% of DSP cases in UK[6] and Oman[28] studies respectively, made use of substances from the combination of different classes.

13.2% of the DSP cases were associated with alcohol use, whereas, alcohol use in conjunction with self-poisoning was reported in 29% of DSP cases in a British study.[43]

In essence, drugs/agents used for DSP are relatively available and little can be done to curtail their accessibility. Therefore, prevention through psycho-social support may still be the way out.

5.4 Clinical presentation and outcome

Majority of the patients had normal vital signs and were fully conscious and coherent when assessed at the emergency department. It is therefore possible that some of cases involved individuals who were seeking attention from close family members and/or loved ones. However some of these patients did not have their vital signs adequately recorded in the clinical notes.

The low GCS observed in some of the DSP cases might be as a result of their delayed arrival at the ED. Delay in response by emergency medical services personnel, possibly as a result of their huge work load may also be responsible for the late presentation to the ED. The choice of drug/agent employed for DSP might also have significantly determined the GCS at the ED; central nervous system drugs such as antiepileptics and antidepressants may be responsible for the depressed levels of consciousness amongst patients who overdosed on these drugs. Also, patients with underlying medical co-morbidities may already have a compromised organ-system; and a tendency to deteriorate faster is therefore possible in them.

Considering the association between patients' GCS and clinical outcomes (see Table 9), patients with GCS of 15 had better outcome, as most of them got discharged without complications. On the other hand, all the patients with GCS ≤8 got admitted. Also, considering association between patients' body temperatures and clinical outcome (see Table 10), most of the patients with normal body temperatures got discharged without complications while majority of those with low body temperatures were admitted. More attention should therefore be given to ensuring optimal body temperature for these patients by the EMS personnel right from the scene of incidence.

In all, majority (59.9%) of the patients were discharged without complications. This may be due to the fact that most of them (47.9%) presented timeously (within 9 hours) at the ED. Also, most (89.2%) of the patients were less than 40 years old; none was beyond 59 years. Majority (63.7%) were also without medical co-morbidities. These factors (younger age and absent medical co-morbidity) are in favour of functional, non-deteriorating organ-system and good response to resuscitation, thereby increasing the

chance for favourable outcome. In addition, this may further corroborate the fact that these patients engaged in DSP in order to seek attention from close relatives and/or loved ones; they probably did not intend to commit suicide.

Majority of the patients who did not combine alcohol with drug(s)/agent(s) for DSP got discharged, compared to those who took alcohol, yet, there was no difference in the frequency of admissions. It is therefore uncertain if association of DSP with alcohol use favours a worse outcome.

Abnormal renal and liver function tests were only found in few patients. These might be underlying abnormalities amongst those (36.3%) with medical co-morbidities, since majority (42.2%) of these patients arrived at the ED within 6 hours of the incidence and the blood tests were done soon after their arrival; it is unlikely that these abnormalities were directly related to the poisoning.

Majority (31.6%) of the admissions were into the medical wards. This is in keeping with a study[9] done in the United Kingdom where about 20% of the workload of the medical department is due to self-poisoning. There is therefore, a great need for better fortification and equipping of the internal medicine high care centres in order to optimally meet this demand.

One of the two patients that died, a 32 year old female with HIV infection, took half a bottle of potassium permanganate. Even though she arrived at the ED within three hours, she died nine hours following presentation. This suggests that medical co-morbidities and pharmacological characteristics of drugs/agents used might be important determinants of the clinical outcome of DSP.

Majority of the patients were referred to the Psychologist for evaluation. This was most likely due to the existing hospital policy regarding DSP/parasuicide cases in Pelonomi hospital. Most cases get referred, first to the psychologist. Following the psychologists' assessment, some cases are referred to the psychiatrist for further assessment and management.

5.5 LIMITATIONS OF THE STUDY

The study focused on only one regional hospital in the Free State province. Therefore, the results and analysis of the study may not necessarily be the case in all the other regional hospitals in the Free State or in other provinces of the country. However, it is hoped that the information obtained from the study would be applicable to at least some of the other hospitals in the province and indeed other hospitals in the country.

The medical record storage system in some of the state hospitals is not very effective. As such, some records have been misplaced or lost, and therefore have not been included in the study. For example, no data was available for the months of October 2010, December 2010 and January 2011. This might have significantly influenced the results in this study. Furthermore, incomplete patient history (particularly the reason for DSP) taken by the attending medical doctor have rendered some DSP case files unsuitable for the study.

The presence of some private specialist hospitals (Medi-Clinic, Rosepark Hospital etc) might have attracted some of the DSP cases, most especially the patients with medical insurance. This particular preference of some patients to go to these “other hospitals” might be the reason for the non-representation of the Asian race in this study.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

In conclusion, this study has shown that DSP mostly occurred amongst females. It also showed a higher incidence amongst the age-group 20-29 years. Majority of them resided in areas with poor socio-economic status and are faced with relationship, marital, employment and other psycho-socio-economic problems. These are the usual stressors that trigger suicidal ideation in them.

The most common drug used for DSP was paracetamol which is an over the counter medication. Other drugs used for DSP were patients' prescribed medication e.g. antidepressants and ARVs. Also, household chemicals were employed for DSP. Little, therefore, can be done to curtail the accessibility of these drugs/agents.

It will be beneficial and more informative if this study can be repeated in the private hospitals in Bloemfontein. This may help to get a more accurate racial representation of DSP.

Prevention of DSP may be achieved through psycho-social support by community counselors, social workers and psychologists to the age-group mostly affected. Venues/locations to find such people include schools, hospitals, various places of work and homes, most especially those situated in areas with poor socio-economic status.

Doctors and other health professionals should pay more attention to the psycho-social part of history taking, as vulnerable patients can be identified easily and referred appropriately for psychological assistance on time.

Caution should be taken by pharmacists and doctors when prescribing medication, most especially those that have been shown to be commonly used for DSP.

Proper training of paramedics, ED doctors and other relevant health professionals in the management of poisoning is of utmost importance. Adequate supply of antidotes and other equipments required for the management of poisoning, to the ED and other relevant departments, most especially internal medicine, becomes necessary.

Finally, a lot of important information was not captured in the patients' case notes, as seen in this study; it is therefore suggested that a DSP document, containing the necessary information be drawn up and printed out for use in the ED when assessing these patients.

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APPENDICES

APPENDIX 1: DOCUMENTARY DATASHEET FORM

The Profile of Deliberate Self-poisoning Cases presenting at the Emergency Department of Pelonomi Regional Hospital

SECTION A – GENERAL INFORMATION/DEMOGRAPHICS

1. Gender

Male (1)	Female (2)	

2. Age group (years)

< 16 (1)	16 – 19 (2)	20-29 (3)	30-39 (4)	40-49 (5)	50-59 (6)	60-69 (7)	≥ 70 (8)	

3. Religion

Christian	1	Muslim	2	Jew	3	
Buddhist	4	African/ Trad.	5	Other:	6	

4. Ethnic Group

Black	1	White	2	Coloured	3	
Indian	4	Chinese/Asian	5	Other:	6	

5(a) Occupation

Pupil/ Student (1)	Student (tertiary) (2)	Unemployed (3)	Self-Employed (4)	Employed (5)	

5(b) If employed, what form?

Unskilled	1	Semi-skilled	2	Skilled	3	Professional	4	

6. Marital Status

Single	1	Married	2	Separated/ Divorced	3	Widowed	4	

7. Area of residence

Township/ Rural	1	Inner City/ CBD	2	Suburb	3	
Farms	4	Informal Settlements	5	Other:	6	

SECTION B – POISONING RELATED INFORMATION

8. Date of Poisoning

January 2010	1	February 2010	2	
March 2010	3	April 2010	4	
May 2010	5	June 2010	6	
July 2010	7	August 2010	8	
September 2010	9	October 2010	10	
November 2010	11	December 2010	12	
January 2011	13	February 2011	14	
March 2011	15	April 2011	16	
May 2011	17	June 2011	18	

9. Day of the week

Monday	1	Tuesday	2	Wednesday	3			
Thursday	4	Friday	5	Saturday	6	Sunday	7	

10 (a). Type of poison/ drug used

Paracetamol	1	AntiHPT	2	Benzod	3	AntiDep	4	Organophosphate	5	
Antibiotics	6	Antiepileptics	7	ARVs	8	Household chemicals	9	Other:	10	

10 (b) Multiple drugs/ agent

Two	1	Three	2	> three	3	

11. Quantity of drug used (if known)

Small	1	Great	2	Huge	3	unknown	4	

12. Poisoning associated with alcohol use?

Yes	1	No	2	

13. Toxic screen done?

Yes	1	No	2	

14. If yes, positive agent(s) identified

Cannabis/ dagga	1	Other:	2	

15. Access to poison/ drug

Own medication (1)	Relative's medication (2)	Pharmacy (3)	Household chemical (4)	Not stated (5)	

16. Reason for poisoning

Marital issues	1	
Relationship issues (unmarried)	2	
Psycho-social	3	
Medical reasons	4	
Family issues	5	
Depression	6	
Unemployment	7	
Post traumatic stress disorder	8	

17. Any previous poisoning?

Yes	1	No	2	Not stated	3	

18. If yes, how many times?

Once	1	Twice	2	> Twice	3	

19. Time between poisoning and presentation at the Emergency Department

0-3 hrs	1	4-6 hrs	2		
7-9 hrs	3	> 9 hrs	4	Not stated	5

20. Clinical state on presentation:

(a) GCS

15	1	9- 14	2	≤8	3

(b) Blood Pressure

Normal	1	Low	2	High	3	Not stated	4	

(c) Pulse Rate

Normal	1	Low	2	High	3	Not stated	4	

(d) Respiratory rate

Normal	1	Low	2	High	3	Not stated	4	

(e) Temperature

Normal	1	Low	2	High	3	Not stated	4	

(f) Oxygen Saturation

Normal	1	Low	2	Not stated	3	

21. Pre-hospital intervention:

Induced Emesis	1	Charcoal	2	Other:	3	Not stated	4	

22. Medical Co-morbidities

Diabetes Mellitus	1	Hypertension	2	Depression	3	Epileptic	4
HIV infection	5	Pregnancy	6	Other:	7	None	

23(a). Outcome:

Discharged without complication	1	Admitted	2	Death	3	

23 (b) Psychiatric/ Psychologist referral?

Yes	1	No	2	

24. If admitted, where?

Medical Ward	1	I.C.U	2	Other:	3	

25. Complications:

(a) Renal Pathology:

Urea:

Normal	1	High	2	Not stated	3	

Creatinine:

Normal	1	High	2	Not stated	3	

(b) Liver Pathology:

AST:

Normal	1	High	2	Not stated	3	

ALT:

Normal	1	High	2	Not stated	3	

GGT:

Normal	1	High	2	Not stated	3	

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr MOA Benedict

CLEARANCE CERTIFICATE	**M120427**
PROJECT	The Profile of Deliberate Self-Poisoning Cases Presenting at the Emergency Department of Pelonomi Regional Hospital
INVESTIGATORS	Dr MOA Benedict.
DEPARTMENT	Dept of Family Medicine/Emergency Medicine
DATE CONSIDERED	04/05/2012
+DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 04/05/2012 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr Charl Loggerenberg

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

APPENDIX 3: LETTER OF APPROVAL

pelonomi hospital

Department of Health
Pelonomi Regional Hospital
FREE STATE PROVINCE

DATE:	9 MAY 2011		ENQUIRIES
TO:	**Dr Benedict M.O.A** **Wits University** **Johannesburg**	**FROM:**	**Prof Smit S.J** **Acting Head: Clinical Services** **Pelonomi Regional Hospital** **Bloemfontein** **Tel: 051-405 1936**

SUBJECT: PERMISSION TO CONDUCT RESEARCH ON DELIBARATE SELF POISONING IN THE EMERGENCY DEPARTMENT

Pelonomi Regional Hospital will only grant permission when the following criteria have been met.

- ☐ That you obtain Ethical Clearance from the Human Research Ethics Committee of the relevant University.
- ☐ That the Hospital incurs no cost in the course of your research.
- ☐ That access to the staff and patients at the Pelonomi Hospital will not interrupt the daily provision of services.
- ☐ That prior to conducting the research you will liaise with the supervisors of the relevant sections and introduce yourself with permission letter and to make arrangements with them in a manner that is convenient to the sections.

Yours Sincerely

Pelonomi Regional Hospital
P/bag x 20581
BLOEMFONTEIN
9300

Prof Smit S.J
ACTING HEAD: CLINICAL SERVICES