

**UNIVERSITY OF THE WITWATERSRAND
JOHANNESBURG**

**RISK FACTORS ASSOCIATED WITH, AND IMMEDIATE
MANAGEMENT OF, BURNS IN CHILDREN LESS THAN
FIVE YEARS IN SOWETO.**

RESEARCH REPORT

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**MASTER OF MEDICINE
(PAEDIATRICS)**

N. J. MOGALE
Student No. : 8410232

SUPERVISOR : PROFESSOR E ROSEN

Department of Paediatricss
Johannesburg, South Africa

ABSTRACT

OBJECTIVES

To describe the risk factors associated with burns, to ascertain immediate home and hospital management and to endeavour to establish appropriate recommendations to prevent or reduce the incidence of burns.

DESIGN

Descriptive, KAP [Knowledge, attitude, practice] study

SUBJECTS

All burns patients five years and less presenting at Baragwanath Burns Unit from the months of July to September 1997.

RESULTS

Hundred and fifty children were seen between the months of July and September 1997. There were 89 (59.3 %) males and 61 (40.7 %) females. Children less than six months comprised only 4 (2.6 %) of these burns. Of these burns 74.6 % were scalds, 13.3 % were flame and 7.3 % were contact burns. Spillage of hot water and tea were the main causes of scalds.

Only 26.7 % of the study population stayed in shack houses and 87.3 % had electricity at home. The mean occupancy rate was 2.5 people per one room. All children were presented to the health centres within 24 hours of the injury, except for one who arrived suffering from a burn wound which had become septic. There was only one death from inhalation burns. The vast majority of parents (85.9 %) said they had learnt something about the prevention of burns from the incident. Only 37.6 % of the parents said they were taught health education regarding the immediate home management of burns by the doctors or nursing staff. When the injury occurred, 82.7 % of the children were not alone in the house and 41.7 % of these were with their mothers in the same room while 26.8 % were with their siblings, none of whom were more than 13 years of age.

CONCLUSION

Many of the risk factors identified in this study are preventable. Education remains the key factor in the prevention and management of burns. Overcrowding appears to be another reason for burns, however, further studies need to be conducted in order to prove this. The health workers need to be encouraged to help educate the patients and caregivers regarding prevention as well as emergency management of burns.

The media, mainly radio stations should also be more extensively utilised for this purpose as it is already successfully done via the Soul City edutainment program on radio and television.. Better supervision of children can also be facilitated by older siblings (not pre-teenagers) taking care of the children and by the private sectors together with the government supplying and subsidising daycare centres for their employees. Notification of burns would help to target the appropriate areas which need immediate intervention.

DECLARATION

I declare that this dissertation is my own. It has not been previously submitted to any other Department or University.

The study was approved by the committee for research on human subjects (University of the Witwatersrand).

N. J. Mogale

PREFACE

Burns are still a common problem in the world and in our developing country. The risk factors associated with burns seem to be of a preventable nature and the correct immediate management of burns is also important for the reduction of morbidity and mortality associated.

This project could not have been completed without the help of the following people :-

1. The patients and their parents/guardians who consented to participate in the study.
2. Prof. E. Rosen who is my supervisor, for his support throughout.
3. Dr Sekeito and Mr Bakinawa of the Johannesburg Civic Centre for helping me with suggestions of protocol and project construction.
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INTRODUCTION

Burns are a common problem worldwide and are increasingly recognized as an important cause of morbidity and mortality in developing countries (1). In France, a first world country, burns account for 3 – 8 % of childhood injuries, with the highest proportion being seen in the youngest age group (2). In western India, a developing country, burns account for 9.1 % of all hospital admissions in the 0 – 10 years age group (3).

In South Africa, burns are one of the top four causes of injury related to mortality among children less than 14 years of age (4). The Child Accident Prevention Center found that 3 % of all paediatric deaths were due to burns(5). In Hlabisa hospital (Kwazulu-Natal) 1994, paediatric burns constituted 7 % of all paediatrics admissions (6). Baragwanath hospital (in Gauteng) sees approximately 150 new patients with burns a month (personal communication) and about 13 % of these require admission. The incidence of these burns is highest during winter months.

The long-term effects of burns often include a severe degree of physical and psycho-social inequilibrium.

Patients often require prolonged hospitalization which may place a financial burden on the individual as well as the state.

Hayes – Windy et al reported that in their center, the average cost of care was over \$7,000.00 per patient for those who required surgery (12).

The types of burns commonly seen are scalds, flames, contact, chemical and electrical burns. Of these, scalds are the most prevalent in the under 5 years old group (2,3,6,7,8,9,13). This is due to the fact that the under five year olds are nearly always with their mothers in the kitchen.

Most scalds are due either to overturning of cups containing hot tea (drinks) and of kettles filled with boiling water or the spillage of hot food from cooking pots onto the victims. The bathroom also emerged as a dangerous area for infants (< 2 years), because of the risk of immersion into extremely hot water (2). This is often associated with extensive deep burns, long hospital stays and residual abnormalities.

Other hazardous practices resulting in burns include the use of kerosene to rekindle fires, careless use of gas appliances or faulty electrical circuits.

Among the black community, there is a commonly held belief that burns can result from being bewitched or invoking of ancestral displeasure.

These beliefs pertain to any form of bullous eruptions which may resemble burns, e.g. streptococcal skin infections, staphylococcal infections, auto-immune bullous formation, insect bite, etc.

Children are the primarily affected group, especially those less than five years old (9). The most common type of burns in this age group is scalding, and the highest incidence typically occurs in the twelve to thirty six months age group, as such children are developmentally inquisitive, yet inexperienced (2, 8, 10). The other reasons postulated for the commonness are that firstly, preschool children stay at home all day and are frequently running in and out of the kitchen; secondly, because of the large size of the families, huge cooking pots are used to prepare meals, which explains scalding due to spillage and thirdly, children often play with matches and this in turn causes major burns due to them setting their clothes or houses on fire. Children below six months are frequently secured on the backs of their mothers or nannies, which accounts for their low burn incidences (11).

To the best of my knowledge and according to the literature, male children are predominantly affected (2,3,12). While no specific reasons are postulated for this, it would appear that boys are the more active and adventurous of the sexes.

The peak time as shown by a Welsh study was in the evening corresponding to meal times (7). In Cape Town (1991), residential fires accounted for 75 % of childhood fatalities related to burns, with the majority occurring during winter, over weekends and in informal settlements (4).

A burn in a child has both immediate and long-term sequelae. The severity of the injury is related to the rate of the heat transfer to the skin. This property is dependent upon the temperature and duration of contact of the agent and the specific heat and conductivity of the local tissues (12). There is irreversible damage to the basal epidermal cells after six hours of contact at a temperature of 44 degrees celsius .

As the temperature increases only 3 degrees celsius, significant partial thickness burns are noticed in less than 30 minutes.

Further increase of temperature to 51 degrees celsius results in complete epidermal necrosis after only four minutes. As the temperature increases above 70 degrees celsius, less than two seconds is needed for complete destruction of the epidermis.

The duration of contact between the liquid and the skin also depends on the viscosity of the liquid. Viscous oils, greases and chemicals cling to the patient's skin and cause extensive damage. The above findings have all influenced the method of managing burns and also indicate the importance of the immediate management of these burns.

The patho-physiological changes in the burn wound are characterized by effects caused by heat per se and superimposed on those is a pronounced acute inflammatory process.

A sudden increase in body surface temperature results in prompt local responses by the blood vessels in the area in an attempt to dissipate heat by vasodilatation.

A further increase in tissue temperature starts an inflammatory reaction caused by local release of inflammatory mediators and cascades of reactions then take place.

The inflammatory responses to injury, infection and antigen challenge with overproduction of chemical mediators, activation of leukocytes and endothelial cells and an alteration in circulating cytokines may all contribute to systematic effects. These effects include septicemia, Adult Respiratory Distress Syndrome (ARDS) and Multiple Organ Dysfunction Syndrome (MODS).

Wound sepsis is the commonest complication, the most frequent infective agent being staphylococcal aureus followed by pseudomonas aeruginosa. Hypovolaemic shock is the next most common complication (8).

The immediate management of burns according to Baragwanath hospital protocol includes removal of smoldering or hot clothing, immersion in cold water or covering wound with wet compresses for ten minutes as long as the burn is less than 25 % total body surface as this would reduce the depth and severity of burns area (TBSA). No oily substances should be applied topically as these aggravate the severity of the burns. Irrigation of the wound is important, especially in chemical burns and avoidance of traditional applications to minimize wound infection. These patients should be transported immediately to the health care centers.

Aims and Objectives

Much has been written about burns as regards risk factors, management and prevention. The high number of burn patients still seen at Baragwanath hospital, which serves most of Soweto, indicates that childhood burns are still a significant health problem in the area.

It was thus thought useful to conduct a study so as to establish the main causes of burns and their immediate management in this community with the objective of being able to make recommendations to the Health and possibly Education departments to set up programs aimed at burn prevention.

The cost of treating acute burns and their late complications is extremely high, and with the present budget constraints, burns prevention would be extremely cost effective.

This would also imply that the primary health care clinics should concentrate more than before on the prevention of burns programs like they do for other illnesses.

The long-term psychological sequelae of burns are a burden to the families, as well as the patients. They may well result in the disruption of family structures, neglect of the patient by the family, especially in impoverished families, severe strain on the economic status of the patients, etc. These could be avoided if the prevention of burns is a priority in the family.

SUBJECTS AND METHODS

The subjects of the study comprised all children with burns aged five years and less residing in Soweto, who were seen at the Baragwanath Burns Unit from July 1997 until the required number was seen. Their parents or guardians were interviewed as per questionnaire. Those who were seen in the absence of their caregivers were followed up at their homes in order to complete the interview. Other relevant information was extracted from their hospital files. If however the parents were not interviewed within fourteen days of the burn episode, the patient was excluded from the study.

SETTING

Soweto is the largest black township in the Gauteng Province of South Africa and forms a large part of the Southern Metropolitan region. It has a population of approximately 1.2 million people with about 20 % being children less than five years old. Most burns patients in this area are seen at the local clinics, by GPs and Baragwanath hospital Burns Unit. Some of the patients seen at the clinics are referred on to Baragwanath Burns Unit for management irrespective of the severity of the burns.

This has thus enabled one to enroll patients with burns of varying degrees of severity for the study. Baragwanath Burns Unit has both in-patient and out-patient departments handling burns.

STUDY DESIGN

The study was a descriptive study including the KAP (Knowledge, Attitude, Practice) facet and was carried out between the months of July and September 1997.

THE SAMPLE SIZE

The majority of burns occur during the winter season. This study was therefore conducted during this period, from the month of July to September. One hundred and fifty patients were enrolled and this study is a descriptive analysis of the sample during this targeted period.

IMMEDIATE MANAGEMENT

Patients' home and hospital management was assessed within 72 hours of burns by the investigator according to the Baragwanath hospital protocol (as discussed earlier in the introduction). The home management was obtained from the parents or guardians and the hospital management from the hospital files. Parents and guardians were also given the opportunity to assess the hospital management.

STATISTICAL ANALYSIS

Data was captured and analyzed by means of Epi-Info V.6.

RESULTS : Over a period of 3 months

SAMPLE DEMOGRAPHICS

There were 150 patients enrolled in the study. Of these, 89 (59.3 %) were males and 61 (40.7 %) were females, with a male-female ratio of 1.45 : 1. The male preponderance manifested throughout all age groups.

Patients enrolled were all less 5 years old. The majority, 102 (68 %), were between 6 – 36 months. Only a very small number 4 (2.6 %), were below 6 months of age, (Fig. 1).

SOURCES AND SEVERITY OF INJURIES

Scalds occurred in 112 cases (75.3 %) and flames (i.e. burns due to direct contact with fire) in 20 cases (13.3 %), (Fig. 2). Of the scalds, the majority of burns were due to hot water from kettles, pots and mugs, followed by hot tea.

Hot oil and hot foods accounted for only a few scalds. Flame burns were caused with equal frequency by either candle stick fires, open fires, burning paper, conflagration of home, burning plastic or clothes fires. Contact burns were mainly due to hot floor level stoves. Chemical and electrical burns accounted for 2 (1.3 %) and 4 (2.7 %) injuries respectively.

In addition, there were two patients in whom it was claimed that the burns resulted from being bewitched (Fig 2).

Only one patient had inhalation burns. Burns of less than 10 % were sustained in 116 (79.9 %) children. A further 20 (13.4 %) had 10 – 20 % burns and 13 (8.7 %) had more than 20 % burns. Most (75.8 %) of the less than 10 % burns were scalds, and only 6 (5.3 %) of those with scalds had more than 20 % total body surface area involved. Of the 20 patients who had burns from flames, 7 (35 %) had more than 20 % burns.

Regarding the depth of burns 69 (46 %) had first degree burns, 79 (52.7 %) had second degree burns and 2 (1.3 %) had third degree burns.

BODY REGION INVOLVED/AFFECTED

The body region mostly involved proved to be the trunk with 86 (57.3 %) children affected in this area. The head and neck regions were affected in 62 (41.3 %) children, upper limbs in 65 (43.3 %) children and lower limbs in 53 (35.3 %) children. Only 9 (6.0 %) children suffered perineum burns (Table 1).

PHYSICAL AND MEDICAL HISTORY

None of the patients seen had physical disabilities before the burns accident. Only 2 (1.3 %) were previously burnt and another 2 (1.3 %) were epileptics but their burns were not related to any seizure attack.

PLACE OF ABODE

One hundred and ten (73.3 %) of the children resided in brick houses and 40 (26.7 %) in shacks. Of those living in brick houses, 104 (95.4 %) had electricity, as did 27 (67.5 %) of the shack dwellers.

Amongst the occupants of brick houses 79 (71 %), suffered scalds and 15 (13 %) flame burns, whilst amongst the shack dwellers 34 (85 %) suffered scalds and 5 (12 %) flame burns, (Table 2).

The mean occupancy rate (i.e. the number of people per one room) was 2.5 with the mode of 3 and a range of 1 – 9.

Regarding the position of the stove, 29 (19.6 %) of the 150 families had floor level stoves. There was no significant difference between brick and shack houses regarding the stove position (48.3 % were brick houses and 51.7 % were shacks).

CHILD CARE

There were 57 (38 %) parents who were unmarried and 93 (62 %) who were married ($p = 0.0$). Most of the accidents, 127 (82.7 %) occurred whilst the child was not alone.

Approximately one-third, 53 (35 %), of these children were with their mothers, 34 (22.6 %) with siblings who were less than 14 years of age, 5 with their fathers and 35 (27.6 %) were either at the creche or with other caregivers, (Table 3). Twenty three (15.3 %) of the children were alone when they got burnt.

IMMEDIATE HOME MANAGEMENT

There were 80 (53.3 %) children who received home first aid before being taken to the health center. Of these, 56 (70 %) received what is considered to be the appropriate first aid (i.e. being wrapped with a wet cloth or having cold water poured over the burnt area). Fortunately only one of those who had more than 20 % burns was wrapped with a wet cloth since this is contraindicated, as it may lead to hypothermia, (Fig. 3).

HOSPITAL MANAGEMENT

All but one patient presented to the hospital within 24 hours of injury. This patient is the only one who presented with wound sepsis. Of these, 87 (58.4 %) were admitted and 63 (41.6 %) were managed as out-patients. Burns management was dependent largely on the part of the body affected, degree of burns and the availability of dressings.

The Baragwanath burns wound protocol was followed by all doctors in all cases. There did not seem to be any protocol followed for antibiotic cover. The antibiotic use was dependent upon the attending doctor. In some cases, these were used even in the absence of infection.

There were 64 (42.2 %) patients to whom Tetanus toxoid vaccination was not given. Unless one has proof of its administration from the Road to Health card, Tetanus toxoid vaccination must always be administered as per hospital protocol.

PARENTAL ATTITUDE AND LEARNING EXPERIENCE

There were 132 (88.6 %) parents/ guardians who were happy with the hospital management, and 129 (86 %) said they had learnt a lesson regarding burns prevention from the incident. Only 56 (37.6 %) were taught about immediate home management of burns by the medical or nursing staff at the health centers.

DISCUSSION

Burn injuries are a worldwide problem and more so in developing countries. They continue to be a major environmental hazard responsible for significant morbidity and mortality in the community, with most injuries occurring at home. The number of patients collected over this study period of three months indicates just how common burns are in this community. The incidence of burns seems to be influenced by the socio-economic factors, and women and children bear the brunt of these injuries. Mothers are involved closely in the care of their burnt children. This may necessitate their staying several days in hospitals, leaving other vulnerable children at home, which may affect the whole family.

In a study done in the Czech Republic, 54 % of burnt children were from urban areas and 46 % from rural areas (14). This study showed that burns are a problem in both the formal and informal settlements in Soweto and most injuries (73.3 %) were from formal settlements and only 26.7 % from informal settlements.. This however, does not mean that most burns occur in formal settlements, since formal settlements constitute about 70 % of Soweto and informal settlements 30 % (estimates according to the Interim District Management Team (IDMT)).

It actually indicates that both the formal and informal settlements have the same incidence of burn injuries.

Children are most commonly the victims of burns, especially those under 5 years of age (9, 14, and 15). The age group mostly affected in the study is 18 - 36 months. This is probably because these children spend most of their day and night times indoors and their increasing mobility makes them difficult to control. They often have excessive motor activities, a lack of judgement, are impulsive and often are disobedient to their parents. Children less than six months were the least affected. This is because they are still young and relatively immobile. They are also mostly secured on their mothers' backs during cooking (11). Males are more affected than females, an observation that concurs with most studies. The reason for this might be the fact that boys are more active than girls and are more likely to get into trouble.

A large percentage (51 %) of these children was with their mothers during the burn injury. Most of these mothers indicated that they felt their supervision was adequate and the blame was put on the "hyperactivity" of the children. It may be postulated that for many mothers the house chores could be so demanding that their supervision of the children becomes impaired due to their physical and mental exhaustion.

A significant number (26.8 %) of the study children were looked after by their siblings, all of whom were less than 13 years of age. It is unlikely that many pre-teenagers would provide constant and adequate supervision for their younger siblings.

Very few children attended daycare centers because these were beyond the financial means of most families. Some parents believed that their children were better looked after at home, and stood less of a chance of contracting infectious diseases than at the daycare centers (information which I obtained during the interview).

The analysis of the socio-economic factors indicated that the single, unmarried status of the mother compared to the married mother was not a significant risk factor for the burn injury. On the contrary, 62 % of the children were from families with married parents (this number could even be more considering the fact that not more than 40 % of the homes in Soweto have married parents (IDMT estimates)). This correlated with the study done in the Czech Republic (14).

The mean occupancy rate was high in the homes in which burn cases occurred. This indicated those unsafe surroundings and might be significant causes of burns.

In overcrowded homes, there is no area for the children to sit or play away from the kitchen and the cooking area. The low socio-economic status of these families also meant that these children did not have toys to play with.

This may have led to them playing with dangerous substances such as matchsticks, electric wires, etc, which were carelessly stored.

In both formal and informal settlements, more than two thirds of the families had electricity. The presence of electricity did not prevent the burns from occurring. Its presence however, influenced the type of burns where in both the formal and informal settlements the most common type seen were scalds and very few flame burns were seen. This was due to the fact that electricity reduced the use of matches in the home. This, therefore, also meant that the number of severe burns was reduced by the presence of electricity.

One can therefore say that electrifying houses reduced the morbidity and mortality related to burns, but does not necessarily prevent burns from occurring.

Of the types of burns, scalds were the most prevalent. Most of these scalds were from hot water and tea spillage.

Children's pulling hanging kettle cords and mugs with hot tea from the table caused these. There were very few patients who sustained scalding from hot foods.

None of the fires were related to smoking. The contact burns were mostly due to floor level stoves, which were within reach of the children.

There was almost the same percentage of scalds and flame burns in both brick and shack houses. This indicated that the type of house had no influence on the incidence of the burn agent. The most important improvement necessary regarding the houses would be the size.

This percentage of scalds and flame burns was also influenced by the presence of electricity in both shacks and brick houses, and hence the lifestyles in both kinds of place of abode was probably the same.

The involvement of the limbs more than the rest of the body is in agreement with most studies. Involvement of limbs could be indicative of the inquisitive and explorative nature of toddlers and children, who have no real sense of danger.

Those patients who were burnt from being bewitched insisted that it was definitely not insect bites nor infection and that it had started as a blister overnight. None of the parents had consulted their "sangomas" to verify this. There is a belief among South African blacks that the ancestors can burn one.

The ancestors apparently burn the child because they might be angry if the child has not been "introduced" to them in a form of a party where an animal (e.g. a goat) is sacrificed and its blood spilt on their graves.

This is a form of sacrifice that has to be performed also to avoid any infirmities that may befall the family. To show their approval, the ancestors will protect the family against such infirmities and there would be harmony and peace in the family.

A very interesting observation was that none of these children were burnt due to any medical or physical disability. There were also none that attributed the burns to child abuse. None of these patients had been burnt before. This correlated with a Ghanaian study, which showed that a burn injury in childhood is associated with a decreased probability of a future burn in the same child (16).

More than half the patients had home treatment before being presented at the hospital. Most of these patients were given proper form of burn first aid. None of the first aid givers had learnt about it from the media or health care centers.

They had just heard about it casually from friends or neighbors and did not understand the reasoning behind this first aid management (which was discussed in the introduction). Perhaps if the reasons of this management could be explained to them, the chances of them forgetting about it would be very slim. Those who never gave first aid or gave the wrong treatment did not know much burns first aid and were eager to learn about this.

The Baragwanath hospital burns treatment protocol has been outlined in the introduction. The treatment of patients regarding antibiotics was also dependent on the attending doctor.

Administration of antibiotics depended largely on the attending doctor's discretion and if there was wound sepsis or inhalation burns. The antibiotics frequently used were PenVK and Cloxacillin in outpatients. When asked why they used PenVK for these patients, the attending doctors said it was to prevent the infection of wounds by the streptococcus bacteria inhabiting the nostrils and Cloxacillin to prevent staphylococcal infection.

For inhalation burns, antibiotics were given according to the bacteria cultured in the unit at a particular time. The use of oral antibiotics in burns is normally not necessary unless there is obvious wound sepsis or septiceamia as the topical dressings used contain antibiotics. It is apparently no longer recommended for antibiotics to be used prophylactically in inhalation burns.

The administration of Tetanus toxoid is important for the prevention of tetanus and one must always make sure that it is administered unless the Road to Health card is seen and it indicates that it has been administered within the last five years with the DPT immunization.

All but one patient presented within 24 hours of the injury. When asked why the patients were immediately brought to the health center, the majority replied that the child was in great pain and none of the caregivers seemed to understand the importance of immediate good treatment of burns in prevention of associated complications such as wound infection, sepsis, hypovolaemia, etc. This also indicated the importance of education.

The Baragwanath burns unit services were very much appreciated by most parents.

Those who were not happy about the treatment were mainly dissatisfied about the initial reception (e.g. long queues) but later appreciated the wound care of the children. Appreciation of good care also indicated that they also understood the importance of taking a burnt child to the health centres for proper treatment and hence fewer complications.

The only patient who presented with sepsis was the one who had first presented to the hospital after 72 hours of burns. Most of the caregivers/ parents said they had learnt a lesson regarding the prevention of burns from the incident. They, however, voiced concern that they were not able to improve on some of the responsible risk factors (e.g. overcrowding, lack of finance, etc.).

Failure of the medical and nursing staff to attempt to educate the parents as regards burns prevention and management was disturbing. This could be due to the staff being overworked, but a weekly lecture would not take much of their time. A teacher might even be hired to educate these parents.

CONCLUSION AND RECOMMENDATIONS

Burns are still a common problem in Soweto's formal and informal settlements. Among children, the age group, which is highly at risk, is 18 – 36 months olds, with males being most commonly affected. In this study, important factors identified were lack of education regarding burns and poor supervision of the young children. Overcrowding also seemed to be one of the risk factors associated with this. It is however the most difficult of these risk factors that the government of the day can prevent. It will take a long time before this problem of overcrowding can be improved, and hence education remains the key factor present, for the prevention of burns and its complications.

Education should start at home by teaching the whole family about behaviour modification which should include careful use of hot water, use of shorter kettle cords, prevention of overhanging table cloths which children could pull to get objects from the tables, cooking above floor level and out of reach of children, safe storage of dangerous substances like matches and chemicals.

Product modification would include legislation to reduce the inflammability of clothing material, safer electric plug covers.

Exposing the mothers and caregivers of these children to this education could be done through the mother and child care sessions that are routinely held at the health centres, which presently aim at exposing them to health education on immunisation and nutrition. The medical staff attending to these children should take it upon themselves to educate the caregivers whenever they bring burns patients to the clinics and hospitals. The media should also be more extensively used for the education as has been done with considerable success by Soul City utilising a multimedia and edutainment approach.

Regarding the education of children themselves, supervision is the most effective way for those who are less than two years of age.

Starting at around two years old, education concerning burns prevention could be added to supervision. Children over the age of three years understand the concept of danger, and hence every moment of the day can be an educational one.

Lack of proper supervision of these children was also a common risk factor. Their pre-teenage siblings who could not provide proper supervision looked after some children. This should be avoided, as it is dangerous.

Usually, the young caretakers attend school, and it would seem sensible to setup specific educational programmes in schools to enlighten them on the safer behavioural patterns to prevent burns.

Daycare centres could also provide better supervision, but these were underutilised mainly due to lack of funds and fear of infectious diseases. The private sector, together with the government could help by subsidising these for their employees and by also building bigger and better daycare centres to alleviate the fear of infectious diseases. Trained daycare teachers could also be employed to try and make the daycare centres more appealing to the parents.

Notification of burns could also highlight the magnitude of the problem and hence help the health authorities to target appropriate areas for immediate interventions.

This study has shown that burns are still an important cause of injury in Soweto. More research into their prevention should continue so as to reduce the incidence and hospital expenditure, which would in turn reduce the government expenditure. Morbidity and mortality related to burns would also be reduced.

APPENDIX A : TABLES

Table 1 : Body region burnt

Body region burnt	Number	Percentages (%)
Head and neck	62	22.5
Trunk	86	31.3
Upper Limbs	65	23.6
Lower Limbs	53	19.3
Perineum	09	3.3
Total	275	100

Table 2 : Kind of house and burn type

	Brick (Number)	Shack (Number)	p-value
Scald	79	34	0.09
Flame	15	5	0.85
Contact	23	1	0.17
Chemical	2	0	
Electrical	4	0	

Table 3 : Person with the child during the incident

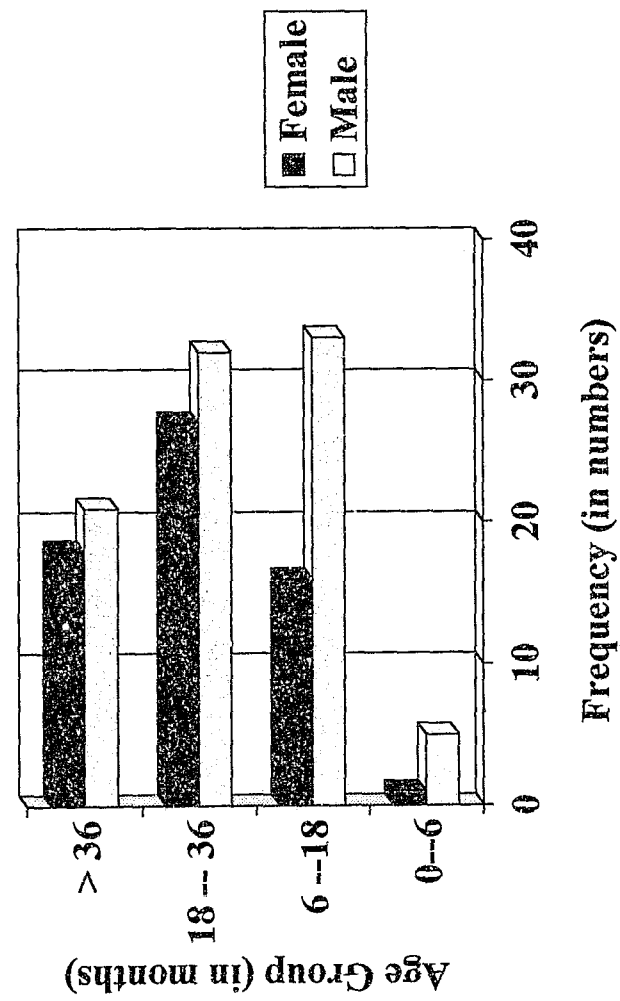
Person with child	Frequency	Percentage
Mother	53	41.7
Father	5	3.9
Sibling	34	26.8
Other	35	27.6
Total	127	100.0

Other = crèches, aunt, friend, granny

Appendix B

Figures

Age distribution of patients



Type of Burns

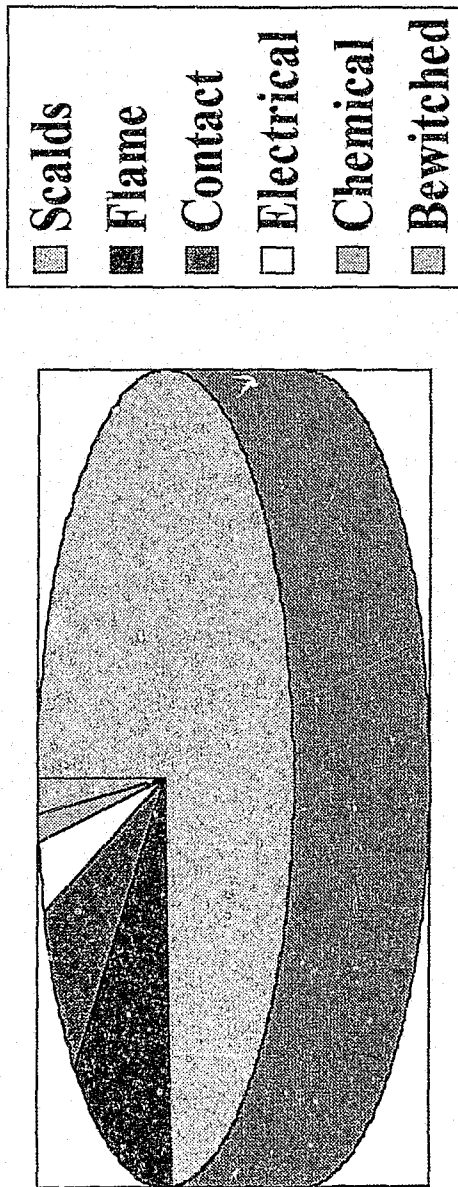
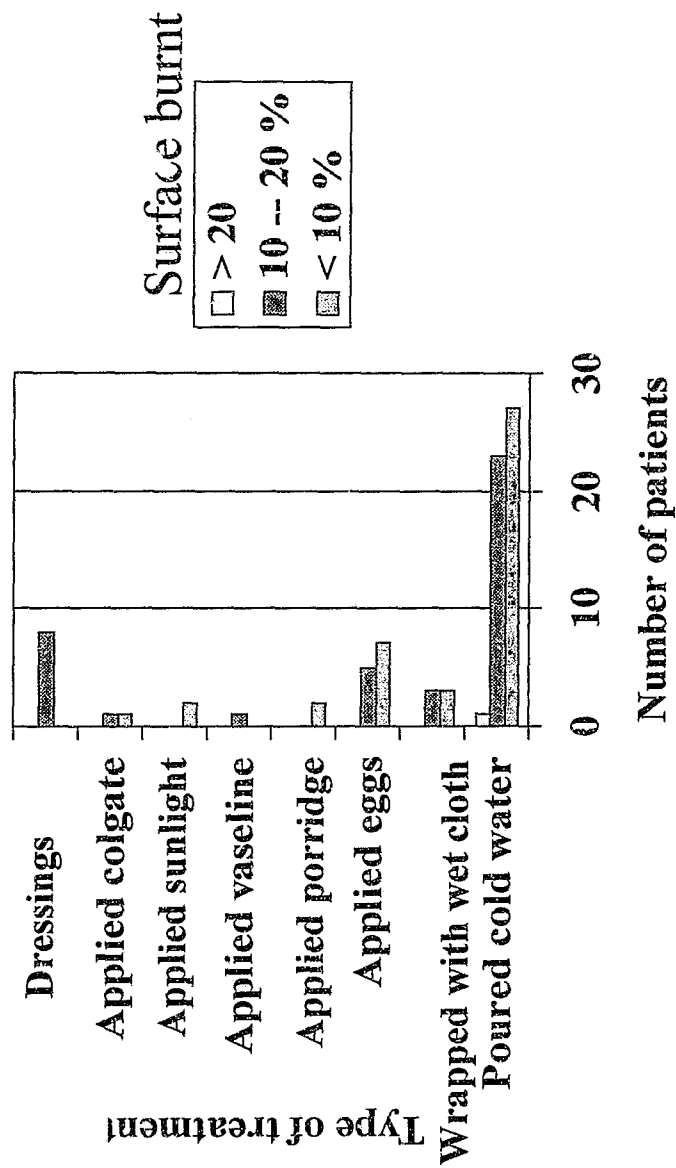


Fig 3

Immediate home treatment and burn size



APPENDIX C : QUESTIONNAIRE

1. Child details

1.1 Sex : 1. Male

2. Female

1.2 Age

1.3 Physical disability : 1. Yes

2. No

1.4 If yes above, please specify

1.5 Post medical history : 1. Yes

2. No

1.6 If yes above, please specify

1.7 History of prevailing events at the scene of accident

1.8 Was the child alone ? 1. Yes

2. No

1.9 If no above, who was with the child? : 1. Mom

2. Dad

3. Sibling

4. Other

- 1.10 Who normally looks after the child?
1. Mom
 2. Dad
 3. Grandmother
 4. Sibling
 5. Other

2 Socio-economic factors

2.1 Number of family members

2.2 Single parent? 1. Yes

2. No

2.3 What kind of house do you have? 1. Brick

2. Shack

3. Other

2.4 If other, specify

2.5 How many rooms are there in the house?

2.6 Do you have electricity? 1. Yes

2. No

2.7 What kind of stove do you have? 1. Electrical

2. Coal

3. Primus stove

4. Gas

2.8 Where is the stove situated? 1. Floor

2. Table

2.9 Where do you store paraffin?

2.10 Where do you store matches?

3 Burn details

3.1 Type of burn injury? 1. Scald

2. Flame

3. Immersion

4. Contact

5. Chemical

6. Electrical

3.2 Presence of inhalation burn? 1. Yes

2. No

3.3 Body region burnt? 1. Head & neck

2. Trunk

3. Upper limbs

4. Lower limbs

5. Perineum

3.4 Burn Size? 1. < 10 %

2. 10 – 20 %

3. > 20 %

3.5 Depth of burns? 1. First degree

2. Second degree

3. Third degree

4. Immediate management < 72 hours

4.1 Did you treat burns at home? 1. Yes

2. No

4.2 If yes, what did you do?

4.3 Was the child taken to the clinic? 1. Yes

2. No

4.4 How was the child treated?

4.5 Was the child taken to the hospital? 1. Yes

2. Referred from clinic

4.6 How long did it take for the child to be taken to the health centre?

4.7 If delayed, > 24 hours, what was the reason?

4.8 How were the burns treated at the hospital?

4.9 Was the child admitted? 1. Yes

2. No

4.10 Was wound sepsis present? 1. Yes

2. No

4.11 Did the patient die within 72 hours of burns? 1. Yes

2. No

4.12 Was Tetanus Toxoid given? 1. Yes

2. No

3. Unnecessary (RTH card seen)

5. Perceptions of health care

5.1 How do you perceive health care? 1. Adequate

2. Inadequate

5.2 Did you learn something about the prevention of burns at home from this incident? 1. Yes

2. No

5.3 Were you taught about treatment of burns at the

Health centre ? 1. Yes

2. No

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Author Mogale N J

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