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A STUDY ON THE PREVALENCE OF BURN INJURIES AMONG PATIENTS ADMITTED IN  
NATIONAL ORTHOPAEDIC HOSPITAL ENUGU, FROM JANUARY 2008 TO  
DECEMBER 2009

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### Abstract

Burn injuries are among the most devastating injuries seen in the emergency unit, ranging from minor to lethal injury. It has been observed as a worldwide problem. The low socioeconomic level of most inhabitants of developing countries, like Nigeria, makes it a devastating injury not only to the patients, but also to overburdened dependents. The knowledge of the prevalence of burn injuries will equip and guide the policy makers and other researchers in planning of preventive programs in this area. Burns occurs when the skin is exposed to excessive heat. Agent-Host-Environment model was as part of the theoretical framework. The agent represents the various causes of burn injuries, the host is the person(s) who may be susceptible to burn injuries, and the host factor is influenced by age, sex, lifestyle and many others. This study is therefore a two years retrospective review of all the patients who presented with acute burn injuries from January 2008 to December 2009. The instrument for data collection was a proforma, which was drawn in line with the objectives of the study. Patients' folders obtained from the medical records department of the hospital were the sources of information. The information obtained includes age, sex, and month of injury, causes and prognosis of the burn injury. A total of 101 patients with burn injuries of various causes were studied. Males were 38.6% while females were 61.1% (ratio, 1:1.5). Flame was the single most common cause of burn injury (60.4%), while hot water was less frequent (25.7%). Majority of burn injuries occurred in the months of January and May (14.9% and 15.8%) respectively. The incidence of burn injury was highest among people within the age group of 0 to 10 years (38.6%). The mortality was 23.8% which is still significant. The researchers therefore suggested a well targeted prevention campaign program to reduce the high incidence and mortality, as most burn injuries are preventable.

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**Keywords:** *Prevalence, Burns, Burns injury, Prognosis  
and Mortality*

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### Introduction

Burn injuries are among the most devastating injuries seen in the emergency unit. Excluding road traffic accidents, they are the most common cause of accidental deaths in both the developed and developing countries. It is obvious that the past few decades have seen many changes in burn care, aimed at decreasing patients' morbidity and mortality. The depth of the injury relates to the

temperature of the source, and the duration of contact (Smeltzer & Bare 2004).

The establishment of improved resuscitation, specialized burn care centers, early surgery, and nutritional support and replacement techniques has decreased morbidity and mortality (Muller, Peg, & Rule, 2001). The cost of managing these injuries are high and most developing countries including Nigeria, cannot afford the high cost of

providing modern burn care facilities (Olaitan, & Olaitan, 2005).

Burn often results in severe deformities, disabilities and adverse psychological reactions which affect patients and their relations. There have been cases where people were literally burnt to death in their houses, cars and offices, leaving the family of the deceased battered and shattered. This is because the greater percentages of the population have no or inconsistent electricity supply, thereby compelling people to use glowing fire in the night. Examples include: the use of firewood for cooking, using candle light for illumination in the night, use of kerosene lantern which are sometimes left on while sleeping, poor electrical wires and appliances, and many others.

The prevalence/epidemiology of burn injury varies from one part of the world to another and even in the same environment over a time period. It is a function of civilization, industrialization, culture and societal stability (Olaitan & Olaitan, 2005).

The emphasis of this study will be on people who have experienced various types of burn injury, and this have led to their presenting at the Regional Burn Center, National Orthopaedic hospital, Enugu State, Nigeria, for proper management and prevention of complication(s).

#### Statement of the Problem

Burn injuries are among the common causes of mortality and morbidity in Nigeria (Dongo, Irekpita, Osegbale, Ogbbebor, & Onuminya, 2009). They have now assumed alarming level with a recurrent state of gasoline explosions from gasoline used for cooking in homes, people pouring strong acids and bases on each other. The harsh economic situations, absence of gainful employment, coupled with greed have contributed to increasing the rate of this incidence.

According to Nnabuko, R., Ogbonnaya, Otene., Ogbonna, Amanari, & Opara, 2007; the low socioeconomic level of most inhabitants of developing countries, like Nigeria makes it a devastating injury not only to the patients, but also to overburdened dependents. Where such a man is the breadwinner, the entire family members suffer. The personal tragedies involved in serious burning accidents need no elaboration. The cost to the community is high, no scale of value can measure the immense suffering endured by patients with extensive burns: prolonged periods during which painful dressings have to be done every second day, blood transfusions accepted, hundreds of litres of high protein feeds swallowed, and extensive surgical procedures undertaken; and often at the end of the illness, the prospects of further long programs of plastic surgery to minimize the disability and disfigurement.

The management of burns remains a challenge in developing countries, like Nigeria. Few data exist to document the extent of the problem. Thus, the need for a study will provide data through documenting the prevalence of burn injury and ascertaining the outcome of the management.

#### Purpose of the Study

To determine the prevalence of burn injuries among patients admitted in the eastern regional burn centre, National Orthopaedic Hospital Enugu (NOHE), between January, 2008 and December, 2009.

The specific objectives of this study are to:

- a. Find out the prevalence of burn injury in this centre
- b. Find out the extent to which gender affects the prevalence of burns.
- c. Find out the extent to which age affects the prevalence of burns.
- d. Determine the prevalent causes of

- e. burns in this centre. Find out which month has the highest prevalence of burn injuries.
- f. Determine the prognosis of burn injuries in this centre

**Significance of the Study**

The knowledge of the prevalence of burn injury in this study area will equip and guide the health workers, policy makers and other researchers in the planning of management and preventive programs in this study area.

Every community is encouraged to study the epidemiology of burns, since this problem varies from community to community and even in the same environment over a period of time.

**Scope of the Study**

This study is delimited to patients who have presented with burn injuries, in National Orthopaedic Hospital Enugu (NOHE), between January, 2008 and December, 2009. Moderator variables such as gender, age, causes of burns, months and prognosis will be covered in this study too.

**Methodology**

This is a two years retrospective study, aimed at determining the prevalence of burn injuries among patients admitted in the eastern regional burn centre, National Orthopaedic Hospital Enugu (NOHE), between January, 2008 and

Year	Total admissions in the hospital	Percentage (%)	Admissions due to burns	Percentage (%)

December, 2009. The sources of information were the patients' folders from medical records department of the hospital. The researchers maintained confidentiality in their data collection by not collecting the patients' names and folder numbers.

A total of one hundred and one (101) patients were used as these presented with burn injuries in the study centre within the above stated study period.

**Sample and Sampling Technique**

Purposive sampling technique was adopted for this study. This implies that only the subjects that presented with burn injuries within the above stated study period were chosen for the study. This agrees with the writings of Polit, Beck & Hungler, 2001, that in purposive sampling technique, the researcher chose subjects that are judged to be typical of the population in question. Thus, the sample population still remains one hundred and one (101) patients.

**Instrument for Data collection**

The instrument for data collection was a proforma, which was drawn in line with the objectives of the study. It was constructed under the following subunits: prevalence according to age, sex, causes, months and prognosis of burn injuries. The proforma was presented to a validator to vet for face and content validation. Corrections were made based on the recommendations of the validator.

**Analysis and Presentation of data**

The data collected were, analyzed in accordance with the research questions. The statistical tools used for the presentation were percentages and frequency tables, bar charts and pie charts.

**Research question 1**

What is the prevalence of burn injury in this centre between January, 2008 and December, 2009?

**Table 1;** shows the prevalence of burn injuries. N=101

January to December (2008)	29,792	52.0	42	0.1
January to December (2009)	27,557	48.0	59	0.2
	57,346	100	1010.3	

**Result:** The prevalence of burn injuries from January 2008 to December 2009 was 0.3%

**Research Question 2:**

To what extent does gender affect the prevalence of burns?

Table 2 shows the prevalence according to sex

Year	Males %	percentages %	females %	percentages %	cumulative %
January to December (2008)	16	15.8	26	25.7	41.5
January to December (2009)	23	22.8	36	35.4	58.2
	39	38.6	62	61.1	
	100				

**Result:** the prevalence of burn injuries was higher among females (61.1%) than males (38.6%)

**Research Question 3:**

To what extent does age affect the prevalence of burns?

Figure 1 shows the prevalence according to age

**Result:** The figure above shows that children within the ages 0 to 10 years had the highest prevalence (38.6%), followed by patients within 21 to 30 years of age (18.8%).

**Research Question 4:**

What are the prevalent causes of burns in this centre?

Figure 2 shows the prevalent causes of burns in this centre.

**Result:** The figure above shows that flame was the commonest cause of injuries in 61 (60.4%) patients. Hot water was the cause of burn injuries in 26 (25.7%) patients, while chemical caused burn injuries in 2 (1.9% patients). Hot oil and electricity however accounted for burn injuries in 6 (5.9%) patients each.

**Research Question 5**

Which month has the highest prevalence of burns?

Table 3 shows the prevalence of burn injuries in different months.

Month	2008 January to December	2009 January to December	Total	Percentage (%)
January	3	12	15	14.9
February	6	5	11	10.9
March	2	9	11	10.9
April	2	8	10	9.9
May	7	9	16	15.8
June	2	6	8	7.9
July	4	5	9	8.9
August	3	2	5	5.0
September	5	1	6	5.9
October	3	-	3	3.0
November	4	1	5	5.0
December	1	1	2	2.0
	42	59	101	100

**Result:** Table 5 above shows that the prevalence of burn injuries was highest between the months of January and May. The prevalence in May was 15.8% while that of January was 1.49%

**Research Question 6:**

What is the prognosis of burn injuries in National Orthopaedic Hospital Enugu (NOHE), between January, 2008 and December, 2009? Figure 3 shows the prognosis of burn injuries.

**Result:** Figure 3 above shows that 5% of the patients had a good prognosis, since their wounds were completely healed. 53.5%

of the patients were to continue visiting the clinic for wound dressing, as their wounds are yet to be completely healed. 13.9% of the patients had contractures and other complications of burn wound, such as: keloid, scar formation, hypertrophies and deformities. 3% of the patients had wound infection, while the outcome was fatal in 23.8% of the patients.

#### Discussion of Findings

The major findings from the study were discussed with respect to the specific objectives set for the study, and in relation to findings from previous related studies.

Objective 1 was to find out the prevalence of burn injuries in National Orthopaedic Hospital Enugu (NOHE). The analysis of the data revealed that out of the 29,792 patients admitted for various disease conditions in 2008, 42 (0.1%) of them had burn injuries while in 2009, 59 (0.2%) out of 27,554 patients admitted for various disease conditions had burn injury. Thus, the prevalence of burn injury in this centre was 0.3%. This result disagrees with the findings of the research conducted by Asuquo, Ekpo, Ngim, & Agbor, (2007) at Calabar. He reported that the prevalence of burn injuries in the area of study was 3.7%. However, this result indicates that the number of burn injuries in 2009 was more than that of 2008, this implies that there is an increase in the number of people who suffer from burns each year, and everybody in the society is at risk of burn injuries and so health professionals, especially nurses, in various rural and urban areas should arise and make the society aware of the burn prevention tips based on the prevalent causes of burn injuries in this area. This can be achieved through health education and the media.

Objective 11 was to find out the extent to which gender affects the prevalence of burns. The analysis of the data revealed that a total of

39 (38.6%) males were admitted for the treatment of burn injuries in National Orthopaedic Hospital Enugu between January, 2008 to December, 2009; while a total of 62 (61.1%) females were admitted in NOHE for the treatment of burn injuries, within the same period. This reveals that the prevalence of burn injuries was higher among females. The reason for these findings can be explained by the findings in objective iv which reveals that the most prevalent cause of burn injuries was flame, as a result of kerosene explosion during cooking. Also based on the findings of Attia, Sherif, Mandil, massoud, Abou-Nazel, & Arafa, (1997), most burn cases occurred in the home, and there seems to be a greater female population. This contradicts the findings of Dongo et al (2007), who in their five year review of burn injuries in Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria, reported that the male to female ratio of the patients admitted for burn injuries was 2.1:1, thereby, stating that the prevalence of burn injuries is higher among the males than females.

Objective 111 was to find out the extent to which age affects the prevalence of burn injuries. The analysis of the data revealed that the highest prevalence of burns for both males and females was within the ages of 0 to 10 years (38.6%), followed by patients within 21 to 30 years of age (18.8%). This result revealed that the incidence of paediatric burns seems to be on the increase in this society as a result of the carelessness of mothers and nannies towards the safety of children. This can be due to scalds from hot water meant for beverages or bath which was kept awaiting mixing with cold water. It can also result from children bumping into adults carrying hot fluids or flames from candle light. This agrees with the findings of Sowemimo, O (1982), who in his eight-year study on burn injuries among patients admitted in Lagos University

Teaching Hospital, Lagos reported that fifty percent of cases (56.2%) occurred in children below 15 years of age.

Objective IV was to determine the prevalent causes of burns. The analysis of the data revealed that flame was the commonest cause of burn injuries seen in 61 (60.4%) patients. The flame was mostly as a result of kerosene explosion in which the greatest number of accidents occurred when patients were attempting a lighted lantern or kerosene stove, thus more females were affected than males. Also, the period of escalation coincided with periods of fuel scarcity, together with increased storage and transportation of petrol, and seasons with higher rate of pipeline vandalization. Hot water was the cause of burns in 26 (25.7%) patients. This accounts for the increase in the number of paediatric burns. Hot oil and electricity accounted for burn injuries in 6 (5.9%) patients; while 2 (1.9%) of the burn cases were caused by chemicals. This concurs with the findings of Asquo et al. (2009), who in their retrospective study of burn trauma in adults at the university of Calabar teaching hospital, reported that flame was the commonest cause of injury, and was seen in 48 (81.3%) patients.

Objective V was to find out the month that has the highest prevalence of burn injuries. The analysis of the data reveals that the incidence of burn was highest between the months of January and May. The prevalence in May was 15.8%, while that of January was 14.9%. This can be as a result of the fall in temperature of the environment which occurs in the temperate regions, as the dry season intensifies and then abates to usher in the rainy season. May is the middle of rainy season in the Southern part of Nigeria. During this period people tend to use various means to restore their normal body temperature and feel warmth, thus, exposing themselves to the risk of burn injuries. This contradicts the findings

of Dongo et al. (2007), who reported that over 40% of burn injuries occurred between November and January.

Objective VI was to determine the prognosis of burn injuries. The data analysis reveals that 5.9% of the patients had their wounds completely healed. While 53.5% of the patients were to continue visiting the clinic for wound dressing, 13.9% of the patients had contractures and other complications of burn wound, such as keloid, scar formation, hypertrophies and deformities. 3% of the patients had wound infection, while the outcome was fatal in 23.8% of the patients. This contradicts the findings of Asquo et al. (2009), who reported that morbidity included burn wound infection in 13 (22%) patients, contractures in 6 (10.2%) of patients and death in 15 (25.4%) patients. This result shows that mortality due to burn injury has remained high in this environment; thereby reducing the workforce and productivity of the society and nation. Thus, the need for the government to embark on a well targeted prevention campaign program to reduce this burn mortality rate in this environment.

#### Recommendations

Based on the result of the study;

- a. Nurses should include burn prevention tips as one of the topics for health education. This will promote the awareness of people about behaviours and practices that expose a person to the danger of burns.
- b. Cooking above floor level and closer supervision of children so as to reduce the incidence of domestic burns.
- c. Strict factory inspection, with religious enforcement of industrial safety laws, so as to reduce the incidence of burns in the working population.

- d. The government should embark on a well targeted prevention campaign program to reduce the high incidence and mortality in this area.
- e. The government should put restrictions on sales of chemicals, so as to reduce the incidence of chemical burns.
- f. Teachers in primary, secondary and tertiary institutions should include burn prevention tips in their curriculum.
- g. The government should establish well equipped burn centres in every community, so as to reduce the stress and risk of transporting a burn patient to a far distance for expert management.
- h. More nurses should be trained as burns and plastic nurses, so as to be able to care for the increased number of burn patients.

#### Summary

The aim of this study was to find out the prevalence of burn injuries among patients admitted in National Orthopaedic Hospital Enugu, from January 2008 to December 2009. The study revealed that the prevalence of burn injury was high in this environment; flame was the commonest cause of burn injuries, the highest prevalence of burns for both males and females was within the ages of 0 to 10 years (38.6%), and that females are more predisposed to the prevalent causes of burn injuries than males.

Limitations were identified as the far distance of the area of study from the researcher. Recommendations were made on the need for promoting the awareness of the public about burn prevention strategies, establishment of more burn centres in every community, training of more nurses on the management of burn patients and the government putting restrictions on the sales of chemicals. Finally, some suggestions were made for further studies.

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