

Table 7.4: Flame Burns and Gender at BLH (1996-2001)

| Age group | Male | Female | Total |
|------------------|------------------|------------------|------------------|
| 0-5 | 29 (58.0%) | 26 (65 %) | 55 (61%) |
| 6-10 | 15 (30 %) | 9 (22.5%) | 24 (27%) |
| 11-12 | 6 (12 %) | 5 (12.5%) | 11 (12.2%) |
| Total (%) | 50 (100%) | 40 (100%) | 90 (100%) |

(n=90)

Chi-squared = 0.4201; p = 0.8105

4.4.5 Gender, Age Group and Socio-economic Status

Tables 8.1 and 8.2 show the frequencies for the children's age groups and socio-economics levels, stratified according to gender. The Chi-squared statistic test for males ($X^2 = 3.1151$, $p = 0.5388$) and for females ($X^2 = 3.8224$, $p = 0.4306$) showed there was no relationship between age and socio-economic status within the males and females ($p > 0.05$).

Table 8.1: Caregivers' Social Level and Age of Male Children (1996-2001)

| Age group | Low income | Middle income | High income | Total |
|--------------|------------------|------------------|------------------|-------------------|
| 0-5 | 51 (69.9%) | 26 (74.3%) | 21 (56.8%) | 98 (67.6%) |
| 6-10 | 16 (21.9%) | 7 (20.0%) | 11 (29.7%) | 34 (23.4%) |
| 11-12 | 6 (8.2%) | 2 (5.7%) | 5 (13.5%) | 13 (9.0%) |
| Total | 73 (100%) | 35 (100%) | 37 (100%) | 145 (100%) |

(n=145)

Chi -square = 3.1151, p = 0.5388

Table 8.2. Caregivers' Social level and Age of Female Children (1996-2001)

| Age group | Low income | Middle income | High income | Total |
|--------------|------------------|------------------|------------------|-------------------|
| 0-5 | 33 (61.1%) | 12 (50.0) | 15 (65.2%) | 60 (59.4%) |
| 6-10 | 15 (27.8%) | 7 (29.2%) | 3 (13.0%) | 25 (24.8%) |
| 11-12 | 6 (11.1%) | 5 (20.8%) | 5 (21.7%) | 16 (15.8%) |
| Total | 54 (100%) | 24 (100%) | 23 (100%) | 101 (100%) |

(n=101)

Chi-squared = 3.8224, p = 0.4306

4.4.6 Educational level of Care givers/Parents

Table 9.1(p.67) shows the educational level of the caregivers or parents of the burn victims. In Ethiopian culture caring for the sick or their children was traditionally the responsibility of women. In this study women were found to be the majority of caregivers (73.6%) for children with burn injuries at BLH. Table 9.2 (p.67) indicates that more than half (55.7%) of the thermal burns occurred in the children of illiterate caregivers. The percentage of children with burns declines in children of caregivers who have some level of education. Illiterate parents were usually those associated with low socio-economic status, no proper schooling and poor home environments. The illiteracy rate was compared with the information from the National Office for Population (NOP) (2001). According to their information, the illiteracy rate was 30.5% among women in Ethiopia.

Table 9.1 Composition of Thermal Burn Victims according to the Educational Level of Parents /Carers (1996-2001)

| Educational level | Number | Percentage |
|--------------------------|---------------|-------------------|
| Illiterate | 137 | 55.7% |
| Primary | 52 | 21.1% |
| Secondary | 37 | 15.0% |
| Tertiary | 20 | 8.1% |
| Total | 246 | 99.9% |

(n=246)

Table 9.2 shows the expected illiteracy versus literacy number based on the national population percent (30.50%). It shows an expected illiteracy of 75 versus 171 for literacy. However, it is clear that the observed illiteracy rate is well above the expected illiteracy rate. $X^2 = 9.351E-18$; P-value is significant at <0.01% level.

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Table 9.2 Observed and Expected Literacy Rate based on National Literacy Rate of Ethiopia (1996-2001)

| Caregivers | Thermal burn victims | | National literacy percentage | Expected number of children with burns |
|-------------------|-----------------------------|-------------|-------------------------------------|---|
| Illiterate | 137 | 55.7% | 30.50% | 75 |
| Literate | 109 | 44.3% | 69.50% | 171 |
| Total (%) | 246 | 100% | 100% | 246 |

(n=246)

(Chi-squared = 9.351 E-18) (p< 0.01)

4.4.7 The Relationship Between Gender and the Place of Accident

The column percentages below show the observed frequencies of the places where burn injuries occur in relation to gender. The result indicates that more burn injuries take place in the kitchen than in the living room. Statistically, the differences are significant at a level of 5%. Clinically this finding is important to target the kitchen area as the primary place for the prevention strategies.

Table 10.1 Place of Burn Accidents and Gender (1996-2001)

| Gender | Kitchen | Living room | School | Unknown | Total |
|--------------|-------------------|------------------|--------|---------|------------|
| Male | 81(54%) | 63(69.3%) | 1* | 4* | 144 |
| Female | 69(46%) | 28(30.7%) | | | 97 |
| Total | 150 (100%) | 91 (100%) | | | 241 |

(n=241)

Chi-square =5.4634, p=0.0194; p<0.05.

* These numbers were excluded from the calculation because of small numbers

4.5 Summary of the chapter

The incidence of burn injuries accounted for 21.6% of the total number of children treated at the BLH during the study period. It was observed that there were fluctuations in the number of burn injuries from 1996-1998. The majority of burn victims were children <5 years, and a predominance of male children was observed. It was evident from the result that the higher the age of the children, the fewer the accidents occurring. Thermal burn injuries, sustained through hot liquids, were the main cause of burn injuries in children in comparison to electrical and chemical burns.

Most burn injuries were found in children in the care of illiterate caregivers. Kitchens were identified as a main place of accidents. The next chapter will discuss the findings that arose from this study.



CHAPTER FIVE

DISCUSSION

5.1 Introduction

In this chapter, the outcome of the study will be discussed in the relation to the aims and objectives of the study. The objectives of the study were: (1) to identify the contributing factors to burn injuries in children, treated at the Black Lion Hospital; (2) to determine the severity of burn injuries, (3) to identify the association between the number of burn accidents and socio-demographic factors such as age, gender, living environments and levels of education. The chapter will end with a summary of the main discussion on the findings.

5.2 CONTRIBUTING FACTORS OF BURN INJURIES

5.2.1 Causes of Burn Injuries of Children at the Black Lion Hospital in Relation to Age group and Gender

One of the objectives of the study was to identify the causal agents of burn injuries among the children aged 0-12 years old at BLH. Of the 250 medical records scrutinised, the two main agents of burns were flame and hot liquids (Table 7.2, p. 63). Hot liquids, followed by flames caused most thermal burns. Similar findings were reported in studies carried out in Nigeria (Onuba & Udoidiok, 1987), in Kuwait (Bang & Mosbah, 1988), in Ethiopia (Daniel & Yoo, 1990) and in Ghana (Forjuoh, 1996). The Nigerian study also found hot liquids to be the most frequent causes of burns (61.1%) in children of less than 5 years of age. This compares well with the current

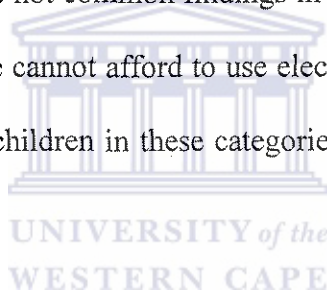
study, where 63.4% of hot liquid burns (or scalds) were seen in this age group at the BLH. In contrast, Haq (1990) reported flame burns (22.%) to be the commonest cause of burn injuries, over and above scalds, in the Kenya Provincial Hospital.

However scald burn was clinically more important among the male children, in comparison to girls in the 0 to 5 age group at the BLH. The majority of burn accidents were thermal burn injuries at the BLH. The possible reason for this could be the lack of awareness of the parents towards the risks of burns (Keswani, 1986; Courtright et al, 1993). None of the children sustained hot liquid burns in the bath. This is in contrast to the findings in Japan by Fukunish , Takahashi , Kitagishi , Matsushima , Kanai & Ohsawa, (2000) in which bath burns accounted for 47.9% of all burns recorded in children. Mercier & Blond, (1996) highlighted that 13.58% of bath burns were reported among young children in France. In Ethiopia hot bath burn injuries among children are not common. This may be due to the fact that children from low socio-economic status may not have access to hot water baths, or they may not report these burns to the hospital.

Young children were most likely to be victims of hot liquid burns, whereas older children were more likely to be burned by flame (Keswani, 1986; Rossignol, Locke & Burke, 1990; Ye, 1998). The possible reasons for this could be that the older children attempt to experiment with lighters, matches or fireworks while they are playing and, as a result, they sustain flame burns. However, this was not found in the current study which was similar to findings in the Ireland whereby no fire work was reported in the Irish Paediatric burn unit on children of 0-14 years of age (Cronin et al., 1996). This is in contrast to the findings in India and Hong Kong where firework and wax- related burns during the mid-autumn festivals, are the commonest thermal burn accidents

among children (Keswani, 1986; Davies, 1990; Ying & Ho, 2001). There was no difference in the proportion of male and female children who sustained flame and hot liquid burns (figures 2 & 3, p.56). In contrast to this finding, Courtright et al., (1993), identified that females were more frequently involved in flame burn injuries in Ethiopia. More female than male children between 6 and 12 years sustained hot liquid burn injuries. This was probably because female children were more associated with working in the kitchen where they assist their mothers with meal preparation. In the Ethiopian culture, girls and women are expected to perform kitchen duties. They usually wear loose fitting clothes made up of nylon polyesters materials, which are easily ignited during fire accidents in the kitchen.

Electrical and chemical burns were not common findings in the study. One reason for this is that in Ethiopia most people cannot afford to use electricity because of its high costs. In addition the numbers of children in these categories were too small to be of statistical value.

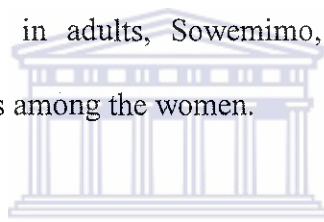


5.2.2 Age and Gender of Burn Injuries Children at the BLH

The majority of burn accidents (64%) occurred in the 0 to 5 year age group, although only 2% of accidents affected children below the age of 1 year. This is in contrast to Libber & Stayton, (1984), who described the most frequently burned children as being infants and toddlers (6-18 months). However, in this study the age range was similar to previous studies by Daniel & Yoo, (1990), Iregbulem & Nnabuko, (1993), and Haq, (1990), with most cases of the burn injuries occurring within the 12 to 60 month age group.

Children in this age group are usually at home with their mothers in the environment where cooking is done indoors, and where they are at risk of burn accidents. In addition, the children's motor and cognitive skills are not yet matured. They may not be aware of dangers and therefore they do not fear touching hot objects. Ignorance of the parents about the child's cognitive and motor development is also a predisposing factor (Keswani, 1986; Archibong et al., 1997).

Boys were predominantly affected in these studies. This was also observed by Fisher & Helm, (1984); Haq, (1990) and Barradas, (1995) who indicated that thermal burn injuries were more common in male than female children. According to Van Rijn et al., (1989) masculine behaviour played a role in burn accidents in male children. When comparing burn accidents in adults, Sowemimo, (1993) found a higher incidence of domestic related burns among the women.



5.2.3 Burn Injuries and the Educational level of the Parents

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Illiteracy among the caregivers of children seen with burns at BLH was higher than the national illiteracy rate of 30.50% (National Office of Population, 2001). The survey demonstrated a statistically significant relationship between the prevalence of burn injuries, and level of education of the caregivers. This finding was supported by studies in Egypt (El-badawy & Mabrouk, 1998) in Kenya (Haq, 1990) and in Ethiopia (Courtright et al., 1993), which found that more children with burn injuries were observed in families run by non-educated caregivers. Illiterate caregivers may have difficulties in reading instructions or warning labels about dangerous flammable substances. The previously mentioned authors such as Herndon, (2002) indicated that

primary health care and education focusing on prevention would play a significant role in reducing unintentional injuries such as burns.

5.2.4 Environments where Burn Injuries occur

Most burn injuries occurred in the kitchen, followed by the living room. This finding concurs with studies done in Denmark (Lindblad & Terkelsen, 1990) in India (Davies, 1990) and in Greece (Petridou, Trichopoulos, Mera, Papadatos, Papazoglou, Marantos and Skondras, 1998) where most domestic burns occurred indoors. Some households in Ethiopia, the kitchen and the living rooms are not separated. For instance, people who live in huts that are made of grass and wood use the living rooms as both kitchen and bedroom, especially in the rural parts of the country.

During meal preparations mothers or caregivers are not able to pay enough attention to the children. In addition, the inquisitive nature of children who want to know what is being cooked may be increased by hunger in male children (Rossignol et al., 1990; Nzarubara, 1999). As a result of the above factors the risk of burn injuries was increased. This evidence demonstrates the considerable need to educate the housewife, and her children about basic fire safety. Ground level cooking, where the children were not shielded from the fire, was the causes of many burn injuries. Therefore, it is suggested that children should never be left alone in the kitchen, particularly if there is fire around. Cooking places should be elevated or a barrier should be erected around the fireplace.

5.2.5 Burn Injuries in Relation to Residential Location

No significant differences in the number of rural and urban burn injuries were found among children. This was in contrast to the finding in Bangladesh by Daisy et al., (2001), which highlighted that children from urban areas are more prone to burn injuries than those from rural areas.

5.2.6 Socio-Economic Status and Burn Injuries

The majority of parents in this study fell within the low socio-economic level. The true socio-economic status was difficult to determine. Some people may not have declared their income in order to escape payment of hospital fees. As this study was retrospective, and based on hospital records only, the association of burn injuries and the socio-economic status of the families or caregivers should be interpreted with caution. The analysis did not reveal the association of burn injuries with a particular gender, age group or socio-economic status of the caregivers. A surprising finding was that older children from the higher-income levels of society were victims of hot liquid burn injuries.

This is contrary to the literature, which demonstrated a more constant relationship between burn injuries and low-income socio-economic status. Studies in Ethiopia (Frank et al., 2001), in Bangladesh (Daisy et al., 2001) and in Mozambique (Barradas, 1995) indicate that children from poor families, aged between 0 and 5 years, are a vulnerable group for burn injuries. However, this is not always true; for example

Forjuoh, (1996) found that none of demographic and socio-environmental variables examined were significant among the Ghanaian children with burn injuries.

5.3 Severity of Burn: Depth and Total Body Surface Area (TBSA)

The total body surface areas of the injuries were, in general, not large when compared with other studies. This may be because clothes covered the children's bodies during the hot liquid accidents (Table 4, p. 60). The majority of children (75.6%) sustained second-degree burns, followed by first-degree burns (14.8%). This result corresponds closely to the studies conducted in Denmark (Lindblad & Terkelsen, 1990) and in Greece (Petridou, 1998). These results are clinically important and suggest early interventions by physiotherapists and the rehabilitation team to minimize the level of complications of burns, such as contracture. Patient with second-degree burn mostly develop scar in the later stage and it will cause a lot of psychological and social stress to the patient or child. Thus, it is imperative for physiotherapist to intervene immediately after resuscitation of patient medically. The depth or degree of burn injury and the TBSA can determine the expected outcome of the burn injuries.

The anatomical areas affected such as hands, elbows, shoulders and facial burns may have serious implications for the child. Head and neck burns represent significant risk factors for poor psychological adjustment. Circumferential neck burn can compress the underlying trachea causing upper airway obstruction (DigreGorio, 1984). A child who is badly disfigured may lack self-confidence in his or her daily activities Keswani, (1978). For example, if the child sustained the burn to the face or the chest, it may cause the child to isolate him or herself from social gatherings or sport such as swimming. In other studies the psychological impacts of burn were found to be more

severe among the female than the male children (Patterson et al., 1993; Ye, 1998). In the Ethiopian context, female children may not be able to marry as a result of prejudice when they develop a disfigurement or handicap. According to some beliefs in Ethiopia, this is considered to be a sign of bad luck. Similar stigmas exist in some Indian cultures (Keswani, 1996).

5.4 Summary of the Chapter

In this chapter, the findings of the study were discussed in relation to previous studies on burn injuries in children. Similarities with other studies were found with regard to the effect of age, place of accident and the cause of burns. No significant associations between the percentage /proportion of burn injuries and the socio-economic status of the caregivers, or the residential location of the children were found. However, a significant association was found between the burned children and illiterate mother. The major causal agent was hot liquid and flame. The hands and the chest were most severely affected by burns. This is clinically important to physiotherapists because burn injuries are predisposing factors for impairment, handicap and disability in the children. Hand and chest are the vital part for activities of daily livings (ADL). The summary of the study, conclusion and recommendations based on the findings will be explained in the next chapter.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The purpose of the study was to compile a profile of burn injuries among children aged 0-12 years, treated at the Black Lion Hospital (BLH) from 1996 to 2001. This chapter will summarise the study and make recommendations based on the results. The limitations of the study will be discussed

6.2 Conclusion of the Study

The objectives of the study were to identify the main causes of thermal burns and factors contributing to burn injuries among children, aged 0-12, at the BLH. It identified thermal burns by hot liquids and flames as major causal agents of burns in the children in the study. No burns were sustained in hot baths. This was contrary to the finding of studies conducted in Japan, France and Denmark. Although many of the associations between the variables were not statistically significant, the findings could still be considered as clinically significant. For instance, the greatest prevalence of burn injuries was found in the 0-5 year age group. This is of great concern, and suggests the need for good supervision and for an awareness of safety measures amongst caregivers for this age group. Also of clinical significance is the fact that the majority of burns were to the hands, followed by the chest the thighs, the shoulders and the elbows. Burns to these areas usually require the skilful intervention by physiotherapists or rehabilitation workers to minimize the level of disability and handicap. The upper limb is essential for activities daily living (ADL) such as eating, drinking and personal care such as bathing and toileting.

A statistically significant difference was found between literate and illiterate mothers or caregivers of children with burn injuries. Most burns occurred in the kitchen. It was surprising to find that more male than female children, sustained burn injuries in the kitchen (Table 10.1 p.68). It is assumed that if no comprehensive prevention and rehabilitation programmes for burn injuries are put in place, morbidity and mortality rates will increase. Thus, health care budgets will be affected and the workload on health professionals, particularly those involved in rehabilitation, will be increased.

6.3 Limitations and Weaknesses of the Study

It is important to emphasize the limited scope of the study in relation to the observed outcome. As the study was carried out retrospectively, there were some errors in documenting the burn injury cases at the records office of the BLH. This resulted in excluding some files from the sample. The time frame for data collection was not enough. The sample size could have been larger if more hospitals were used. This would be useful in order to infer conclusions and make relevant comparisons. The data was collected from past records retrospectively. If the study were conducted prospectively, it would provide more recent information on the pattern and incidence of burn injuries at BLH. A comparison group of children with burn injuries with in the same age group should also be made from other hospital in Addis Ababa. The number and the pattern of burn injuries could then be compared with finding from BLH. As the data collected retrospectively and as child brought by different family members to the hospital identification of biological parents/ caregiver was not possible. Reliability of this study is also affected by the retrospective design.

The strengths of this study might be that it could initiate the development of future prevention strategies for burn injuries within the bio-psychosocial context of health care. Such an approach should be integrated into the existing health care structures.

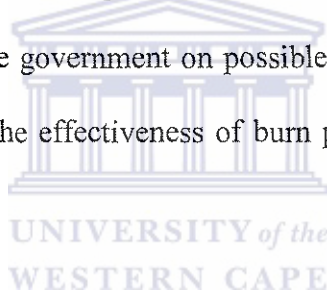
6.4 Recommendations

The decline in death from smallpox was the consequence of campaigns led by the World Health Organization (WHO), which succeeded in eradicating this disease globally. Similarly the prevention of burn injuries, with associated morbidity, disability and mortality should be focused on globally. Burn injuries are global problems and concern both developed and developing countries (Lari, Mohammad, Ali-raza and Mackkay, 2002).

From the perspective of burn prevention, the education of women or carers is important. According to Furjuoh, (1996) the education of female caregivers in basic prevention methods and in first aid for burns was found to minimize burn-related impairments, disability and handicap. Protection of fire places, heating devices and hot objects, hiding matches and flammable liquids from children, turning down water heaters to lower temperatures, and being alert to potential accidents to small children are fundamental to the prevention of burn injuries (Shroff, 1997; Taylor, 2002). In addition, national commitment and community involvement are important in burn prevention.

In conclusion, the author wishes to recommend the following based on the findings of the study: Prevention strategies, as explained above, should target both rural and urban settings. Education about burn prevention could be promoted through literature and posters that can be disseminated through partnerships with fire departments, so as to increase awareness of burn prevention. It is recommended that burn injury preventions should be incorporated into rehabilitation programs for children, because the rehabilitation workers, and particularly physiotherapists and occupational therapists have the opportunity to provide basic education on burn prevention to the parents.

Further studies should be conducted involving all health institutions in Ethiopia in order to determine the magnitude of the problem more accurately. The outcome of such studies could then inform the government on possible burn prevention policies. Such studies could also monitor the effectiveness of burn prevention strategies once they have been implemented.



There is a critical need to promote and develop physiotherapy services in Ethiopia, since there is very limited physiotherapy staff at the BLH. More physiotherapists and occupational therapists are needed to cope with the specific attention that children with burn injuries require.

The physiotherapy curriculum should emphasize health promotion and disability prevention as a module for undergraduate students when dealing with the management of burns in the classroom and clinical practice. The recording and filing of patient records at the Black Lion Hospital needs some attention.

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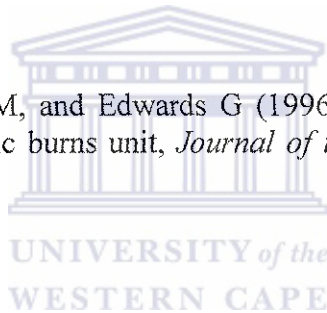
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APPENDIX A

DATA CAPTURE SHEET

PART ONE: SOCIO DEMOGRAPHIC DATA

IDENTIFICATION NUMBER

1 GENDER

| | | |
|---|--------|--|
| 1 | Male | |
| 2 | Female | |

2 AGE

3 AGE GROUP

| | | |
|---|-------|--|
| | 0-5 | |
| 2 | 6-10 | |
| 3 | 11-12 | |

4 RESIDENTIAL AREA

| | | |
|---|---------|--|
| 1 | Urban | |
| 2 | Rural | |
| 3 | Unknown | |



5 CARE GIVERS

| | | |
|---|--------------|--|
| 1 | Father | |
| 2 | Mother | |
| 3 | Aunt | |
| 4 | Siblings | |
| 5 | Grandparents | |
| 6 | Others | |

6 AGE OF CAREGIVER

7 OCCUPATIONS OF CAREGIVER

| | | |
|---|---------------|--|
| 1 | Farmer | |
| 2 | Merchant | |
| 3 | Unemployed | |
| 4 | Civil servant | |
| 5 | Student | |

8 MARITAL STATUS OF CAREGIVER

| | | |
|---|----------|--|
| 1 | Single | |
| 2 | Divorced | |
| 3 | Married | |
| 4 | Widowed | |

9 EDUCATIONAL LEVELS OF CARE GIVERS

| | | |
|---|------------|--|
| 1 | Primary | |
| 2 | Secondary | |
| 3 | Tertiary | |
| 4 | Illiterate | |



10 NUMBERS OF CHILDREN IN THE HOME

11. INCOME PER MONTH (1 \$=8.55 ETHIOPIAN CURRENCY (BIRR))

| | | |
|---|---------|--|
| 1 | 50-100 | |
| 2 | 101-200 | |
| 3 | 201-300 | |
| 4 | 301-400 | |
| 5 | 401-500 | |
| 6 | >501 | |

12. NUMBER OF ROOMS IN THE HOUSE

PART TWO: FACTORS RELATING TO THE BURN INJURY

1 TYPE OF BURN

| | | |
|---|------------|--|
| 1 | Thermal | |
| 2 | Electrical | |
| 3 | Chemical | |
| 4 | Other | |

2.CAUSE OF BURN

| | | |
|---|-------------------|--|
| 1 | Flame | |
| 2 | Hotliquid | |
| 3 | Charcoal | |
| 4 | Stove | |
| 5 | Electric/Chemical | |

3.DEPTH OF BURN

| | | |
|---|---------------|--|
| 1 | First degree | |
| 2 | Second Degree | |
| 3 | Third degree | |



4.PERCENTAGE OF TBSA

| | | |
|---|--------|--|
| 1 | 0-10% | |
| 2 | 11-30% | |
| 3 | 31-50% | |
| 4 | >50% | |

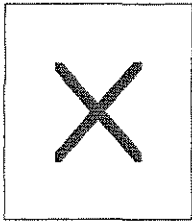
5.MAIN AREA OF BURN

| | | |
|---|------------|--|
| 1 | Face | |
| 2 | Chest | |
| 3 | Hand/Elbow | |
| 4 | Feet | |
| 5 | Thigh/Leg | |
| 6 | Shoulder | |

6. PLACE OF THE ACCIDENT

| | | |
|---|-------------|--|
| 1 | Kitchen | |
| 2 | Living room | |
| 3 | School | |
| 4 | Unknown | |

APPENDEX B



Private Bag X17 Bellville 7535 South Africa
Telephone: (021) 959 2542 Fax: (021) 959 1217

DEPARTMENT OF PHYSIOTHERAPY

March 19 2002

The Director of Black Lion Hospital
Addis Ababa Ethiopia

Dear Sir,

Re: Request for permission

I am a postgraduate student in the department of physiotherapy at University of Western Cape. I am expected to conduct a research study as part of the requirements for Master of Science (Msc) Degree in physiotherapy. The title of my research study will be " The profile of burn injuries among the children aged 0-12 years at the Black Lion Hospital Addis Ababa Ethiopia.

I hereby request your permission to have access to hospital records of the patients, who had burns from Jan 1996 to December 2001. The information gathered will be treated with respect and confidentiality. The study will be helpful in planning and developing burn prevention strategy programs, aimed at minimizing the number of disabled children due to burn injuries. This will also provide information, for more rigorous investigation to be carried out on burn related injuries .The result of this study will be provided to the Black Lion Hospital.

Thank you for your positive response.

Worku Woldegiogis

Supervisor

MRS M MARAIS -----

APPENDIX C



የኢትዮጵያ ዲሞክራሲያዊ ጊኖራሪያዊ ሪፐብሊክ
የኢትዮጵያ ፌዴራላዊ ዲሞክራሲያዊ ጊኖራሪያዊ ሪፐብሊክ
Federal Democratic Republic of Ethiopia
Ministry of Health
አድራሻ: አዲስ አበባ ፖ.ሣ.ቁ. 11234
Tel: አዲስ አበባ ፖ.ሣ.ቁ. Box 11234

ሠወ 813/26/19
11-10-94

በአዲስ አበባ ዩኒቨርሲቲ
ሶፍትዌር አንገገ ሆስፒታል
አዲስ አበባ

ጉዳይ :- የድህረ ምረቃ ትምህርትን ተከታትሎ ለመጨረስ
የሚዘጋጅ የመመሪያ ፅሁፍን /Thesis/ ይመለከታል።

በደቡብ አፍሪካ አገር ኬፕታውን ከተማ በሚገኘው የዌስተርን ኬፕ ዩኒቨርሲቲ
/University of Western Cape/ በማስተርስ ዲግሪ ደረጃ በሬዚድ-ቴራሮ
ትምህርታቸውን በመከታተል ላይ የሚገኙት አቶ ወርቁ ወ/ጊዮርጊስ የመመሪያ
ዕውቀታቸውን የአገጣጠም ምረቃ ስህተት በሀፃናት /The Profile of Burn Injuries
Among Children/ በሚል ርዕስ ለማዘጋጀት እና ሶፍትዌር አንገገ ሆ/ል ውስጥ
ሀክምናቸውን በሚከታተሉት ሀፃናት ላይ ለመመራት መፈለጋቸውን በመጥቀስ ለዚህ
ለሚያደርጉት የምርምር ሥራ ድጋፍ እንዲደረግላቸው በፃፉት ማመልከቻ ጠይቀዋል።

ለልህገም ሠልጣኙ የትምህርት ገዢያቸውን ካጠናቀቁ በኋላ ወደ ሀገራቸው በመመዘስ
በመቻላቸው የሚሰጡትን አስተዋፅኦ ከወዲህ ከግምት ውስጥ በማስገባት በእናንተ ጠኩል
አስፈላጊውን ትብብር እንድትደርጉላቸው እናገለግላለን።

ጋልባጭ፣
ለጤና ባለሙያዎች ትምህርት/ባ.ድን
ጤና ጠበ

ከሠላምታ ጋር
የአዲስ አበባ ዩኒቨርሲቲ
የጤና አገልግሎት ልምት መምሪያ
ጤና

APPENDIX C

ኃይሉ ኢየሱስ ሞያ የትርጉም ሥራ
HAILE YESUS WANNA TRANSLATION OFFICE

Tel. 15 81 30 Fax 505140 P. O. Box 21277 ልዩ ልዩ ጽ/ቤት - Addis Ababa, Ethiopia

June 17th, 2002

Emblem
Federal Democratic Republic of Ethiopia
Ministry of Health

To Addis Ababa University
Black Lion Hospital
Addis Ababa

Subject: This refers to of a thesis writing, which is a requirement for the completion of graduate studies

Ato Worku Woldegiorgis who is currently pursuing his studies for his Masters Degree in Physiotherapy in South Africa, Cape town city at Western cape University and he is writing his thesis on " The Profile of Burn Injuries Among Children" has requested us in writing to be allowed to conduct the research work in Black lion hospital on children who are under treatment in the hospital.

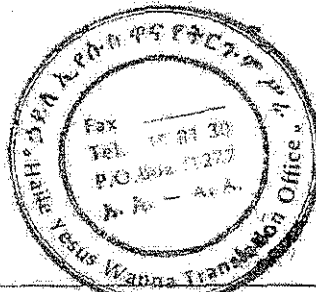
Therefore in view of this and taking into considerations the contributions that the individual would make development of health Service in the country after completing his studies we request you to make all the necessary cooperation and assistance in his endeavor.

With regards
Signed

Yohannes Tadesse.

Health Service and Training Department Head

Copy
To Health Professionals
Ed./T/Team
Public Health

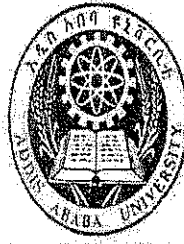


Handwritten signature and stamp: Haile Yesus Wanna, General Manager

አድራሻ: ስታዲየም ዙሪያ ላሊበሌ ጽ/ቤት ስት ስት ቁጥር 402
Address: Around Stadium Infront of Lalibela Restaurant No. 402

APPENDIX D

የአዲስ አበባ ዩኒቨርሲቲ
አዲስ አበባ ፣ ኢትዮጵያ



ADDIS ABABA UNIVERSITY
ADDIS ABABA, ETHIOPIA

ቴሌ
Tele. 55 08 44

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P.O.B 1176

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Telex. 21205

ቴሌግራም
Cable AAUNIV

ቀን
Date 4/7/2002
ቁጥር
Ref.No. E/117/2



To: Ato Worku W/Giorgis

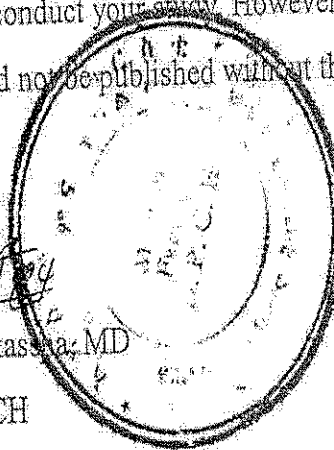
This is to inform you that we have examined your research proposal. Hence, you are allowed to conduct your study. However, as per our conversation the outcome of the study should not be published without the consent of the department.

Sincerely,


Amha Mekassa MD

Head, DPCH

A.A.U- MF



APPENDIX E

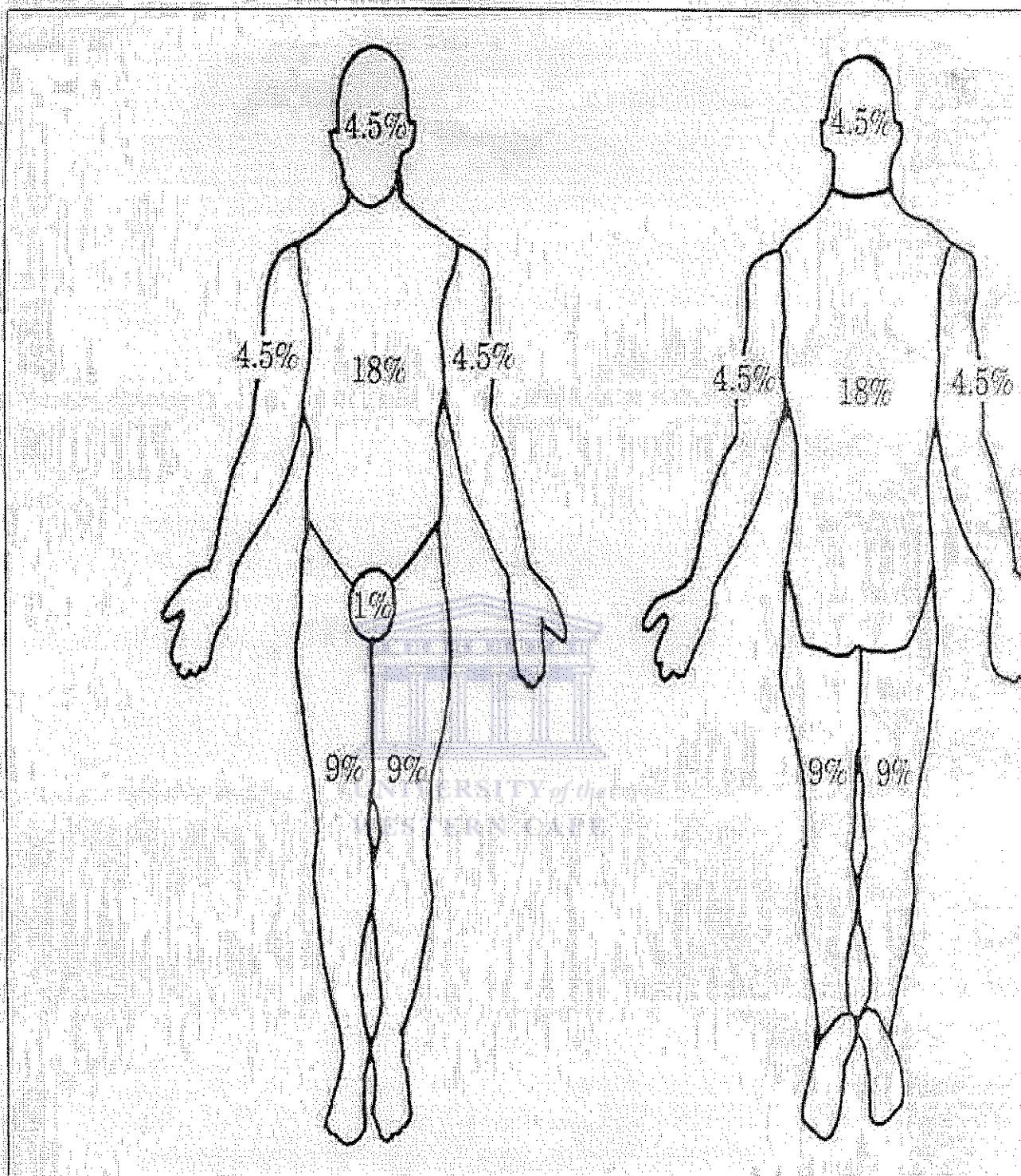


Fig. 1-1. Rule of nines.

Rylah (1992) Rule of Nine Body Chart

Appendix F

Lund-Browder Chart

| Percent Area / % | Age groups | | | | | |
|---------------------|------------|-------|-------|---------|------|-------|
| | Birth- 1yr | 1-4yr | 5-9yr | 10-14yr | 15yr | Adult |
| Head | 19 | 17 | 13 | 11 | 9 | 7 |
| Neck | 2 | 2 | 2 | 2 | 2 | 2 |
| Anterior trunk | 13 | 13 | 13 | 13 | 13 | 13 |
| Posterior trunk | 13 | 13 | 13 | 13 | 13 | 13 |
| Right buttock | 2½ | 2½ | 2½ | 2½ | 2½ | 2½ |
| Left buttock | 2½ | 2½ | 2½ | 2½ | 2½ | 2½ |
| Genitalia | 1 | 1 | 1 | 1 | 1 | 1 |
| Right upper arm | 4 | 4 | 4 | 4 | 4 | 4 |
| Left upper arm | 4 | 4 | 4 | 4 | 4 | 4 |
| Right lower arm | 3 | 3 | 3 | 3 | 3 | 3 |
| Left lower arm | 3 | 3 | 3 | 3 | 3 | 3 |
| Right hand | 2½ | 2½ | 2½ | 2½ | 2½ | 2½ |
| Left hand | 2½ | 2½ | 2½ | 2½ | 2½ | 2½ |
| Right thigh | 5½ | 6½ | 8 | 8½ | 9 | 9½ |
| Left thigh | 5½ | 6½ | 8 | 8½ | 9 | 9½ |
| Right leg | 5 | 5 | 5½ | 6 | 6½ | 7 |
| Left leg | 5 | 5 | 5½ | 6 | 6½ | 7 |
| Right foot | 3½ | 3½ | 3½ | 3½ | 3½ | 3½ |
| Left foot | 3½ | 3½ | 3½ | 3½ | 3½ | 3½ |

Lund-Browder Chart (Rylah, 1992)



UNIVERSITY *of the*
WESTERN CAPE