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Current Nursing Practices for Managing Children with Burn Injuries

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Abstract: Background: Burns are one of the most common forms of trauma in children. Providing adequate care for burnt children properly is the most important contribution to the successful management. **Aim:** This study aimed to describe the current nursing practice provided for managing children with burn injuries and to identify the most common causes of burn injuries among children. **Method:** A descriptive exploratory research design was utilized in the study. The study was carried out in burn unit at Plastic, Reconstructive and Burn Surgery Center and Mansoura International Hospital at Mansoura city on a convenient sample of 56 nurses and 100 pediatric patients. **Tools:** Data were collected by using three tools. Current nursing practices for managing children with burn injury structure questionnaire sheet, Burn care observation checklist and clinical data sheet for children with burn injury. **Results:** The most common cause of burn was boiling water, more than three quarter of studied nurses had poor knowledge about burn and its management, two fifth of them had competent practice about wound dressing, more than two third of studied nurses had competent practice about pain and there was statistical significance difference between severities of burn and children death. **Conclusion:** The present study indicated that, the nurses' knowledge regarding burn was poor and were incompetent in the care practice regarding burn injuries. **Recommendations:** There is a need for burn training program that should be provided to nurses in order to improve their knowledge and practices regarding burn management.

Keywords: Burn injuries, Children, Nursing practice and Management.

INTRODUCTION

Burn is one of the most important causes of child injury that lead to serious health problem; sever social, functional, and psychological impairment. Burns are the major cause of hospitalization and are associated with significant morbidity and mortality. Infant and toddler are at a greater risk for scald burn due to their curiosity and lack of awareness of danger ⁽¹⁾. According to international society for burn injury, burn is defined as damage to body's tissues caused by heat, chemicals, electricity, sunlight, or radiation. Scalds from hot liquids and steam, building fires and flammable liquids and gases. Another kind is an inhalation injury that caused by breathing smoke ⁽²⁾. Worldwide, around 96,000 children under the age of 20 are estimated to have been mortally injured as a result of burns due to fire in 2014. The mortality rate in low-income countries was 4.3 per 100,000 compared to 0.4 per 100,000 in higher income countries. Also, in the United States, approximately 100,000 children are hospitalized annually for burn injuries treatment ⁽³⁾. In Egypt, childhood burns are a significant problem especially in families of low socioeconomic status; these families live in overcrowded flats, which lack proper hygiene and tend to use kerosene stove, which lack of any safety measures. In Ain Shams University, three hundred and five burnt children (305) was admitted to the burn unit over 20 month period ago. Boys proportionately were injured more than girls ⁽⁴⁾.

The prognosis of burn depend primary on the percentage of the total body surface area and the age of the child. The presence of smoke inhalation lesions and other significant injuries will affect the prognosis. Advances in resuscitation, surgical management, intensive care, control of infection

and rehabilitation are responsible for improvement in burn mortality and morbidity ⁽⁵⁾.

Pediatric nurses have challenge and responsibility to assist burnt children effectively by coping with their stress, hospitalization and working toward recovery. Care and management of burnt children may be classified into prehospital care and hospital care. The prehospital care involves first aid and transportation to burn unit; while, the hospital care include prevention of shock, respiratory distress, and acute phase that involves wound care, prevention of complication and nutrition support as well as the rehabilitation and psychosocial counseling ⁽⁶⁾.

AIM OF THE STUDY

The study aimed to describe the current nursing practice provided for managing children with burn injuries and to identify the most causes of burn injuries among children.

RESEARCH QUESTIONS:

1. What are the current nursing practices provided for children with burn injuries?
2. What are the most common causes of burn injuries among children?

METHODS

Subjects:

Design:

A descriptive exploratory research design was utilized in the study.

Setting: The study was conducted at the burn unit at Mansoura International Hospital at Mansoura city and burn unit in Plastic, Reconstructive and Burn Surgery Center affiliated to Mansoura University.

Subjects:

The study comprised of 56 nurses working at the above mentioned setting and 100 available pediatric patients with burn injuries at previously mentioned study setting

Tools: The data were collected by three tools as the following:

Tool (I): Current nursing practices for managing children with burn injury structure questionnaire sheet

This tool was developed by the researcher after reviewing the related literature researcher^(7, 8, 9&10). This questionnaire included three parts:

Part I: Characteristics of the studied nurses including their age, sex, level of education, years of experience & previous training programs

Part II: Nurses' knowledge about burn injuries in pediatric such as definition, causes, signs and symptoms, complication and degree of burn. Questions were in the form of multiple choice questions. The answers were checked with model answer. It contained (20) items that assess nurses' knowledge about burn injuries in pediatric

Part III: Nurses reported practice regarding burn injuries management. It was include questions related to dressing, pain management, care of pediatric burn patient with different types of burn, hypothermia, hyperthermia and shock. Questions were in the form of multiple choice questions and open-end questions. It contained (42) items that assess nurses reported practice regarding burn injuries management

Tool (II): Burn care observation checklist

It was design by the researcher to assess nurse's practice regarding care of children with burn injuries after reviewing related literature^(11, 12, 13 &14). It include checklist contained (108) items to assess the actual nurses' practice toward wound care (39 items), infection control (19 items), care of hypothermia (11 items), care of hyperthermia (11 items), pain management (8 items), and discharge plan (20 items).

Tool (III): Clinical data of children with burn injury

This tool was developed by the researcher and it was divided into of two parts:

Part I: characteristic of the studied children including age, sex, order of birth, residence, education level and living situation.

Part II: medical condition of the pediatric patient such as causes of burns, extent of body surface area, degrees of burns, pattern of burn, time of burn, previous burn injury, mother action taken when burn occur, associated complication with burns, length of stay and grafting.

Field of work:

- Before conducting this study, an official approval was obtained from the responsible authorities.
- The developed tools were tested for their reliability using Alpha Cronbach's coefficient test. The alpha reliability for tool (1) was 0.87, tool (2) was 0.976. .
- Once the necessary approval was granted to proceed with proposed study, the subjects were interviewed and

observed by the investigator to collect the necessary data.

- An informed oral consent was gained from nursing staff and caregivers of pediatric patients after explaining the purpose of the study.
- Nursing staff and caregivers of pediatric patient have the right to withdraw from the study at any time was ascertained as well as the confidentiality of data and anonymity.

STATISTICAL ANALYSIS

- Organizing, categorizing, tabulating and analyzing the collected data was done by using SPSS software version 16.
- Presenting the data were done in tables and graphs as frequencies and percentages.
- A significant finding indicated when the P value of <0.05
- Comparison of categorical variables was done using the Chi square test (X^2).

RESULTS

Characteristics of the studied nurses in percentage distribution **were** illustrated in **Table (1)**. It was revealed from this table that, approximately half of the studied nurses (48.2%) were in the age group from 25 to less than 30 years, while, the minority of them (7.1%) was 35 years or more. Regarding nurses' educational level, the current results revealed that, approximately half of nurses (46.4%) had technical institute in nursing. While, less than one third (32.1%) of them had diploma certificate. Approximately more than half of nurses (51.8%) having 5 to 10 years of experience. In addition, the majority of the studied nurses (85.7%) were married. Concerning attended any previous training programs; the majority of nurses (96.4%) never attended any previous training programs about burn management.

Figure (1) illustrates the most common causes of burn injuries in children. Approximately half (45%) of studied children burn from boiling water; while fire constitute one third 34% of burn causes compared to 5% for electricity burn.

Percentage distribution of studied children clinical data was illustrated in **Table (2)**. It was revealed from this table that, 63% of the studied children were third degree burn, 51% of them were second degree burn; while, 6% were first degree burn. Also, it was founded that 11% of burn occurred at night. In addition, the majority of the studied children (95%) were accident burn. And the majority (99%) of the studied children was not injured from burn before. As well as, the majority of mother performed inadequate first aid. In the same table more than half of studied children (64%) have infection in their wound site. Furthermore, more than half (55%) of studied children had contracture as a complication of burn with approximately more than half of them (59%) were stayed in hospital from 15 to 29 days.

Fig (2): illustrates Total score of nurses' knowledge about burn and its' management. It was indicated that, more than three quarter of the studied nurses (78.6%) had poor knowledge regarding burn and its' management compared to

the minority of them (7.1%) had good knowledge regarding burn and its' management.

Table (3); total level of nurse's practice regarding care of children with burn injuries in percentage distribution. It was revealed from this table that, two fifth (41.1%) of the studied nurses had competent practice about burn wound dressing change; while, 58.9% of them had incompetent practice. As well as, the majority of the studied nurses (98.2%) had incompetent practice regarding infection control. And one quarter (25 %) of the studied nurses had competent practice about care of hypothermia. While, two third of them (75%) had incompetent practice about care of hypothermia. Also, less than one-fifth (19.6%) of the studied nurses had competent practice about care of hyperthermia. As well as, more than one third (35.7%) of the studied nurses had competent practice about discharge plan compared to approximately two third of them (64.3%) had incompetent practice.

Figure (3) illustrates total score of nurses' practice regarding care of burned children. It is indicated that the majority of studied nurses (98.2%) had incompetent practice regarding care of burned children. compared to the minority of them (1.8%) had competent practice regarding care of burned children.

Correlation between the total nurses' knowledge scores and their total practice score **Table (4)**. It was revealed from this table that, there were no statistical significant difference between the total nurses' knowledge scores and their total practice score.

Table (5); Relationship between the severity of burn among studied subjects and its causes as well as children outcome. It was revealed from this table that, there was significant between moderate burn and its causes. Also there was statistical significant between severities of burn and children death ($p=0.003$).

Table (1); Characteristics of the studied nurses

Characteristics	NO (56)	%
Age in years		
> 25	10	17.9
25 -	27	48.2
30 -	15	26.8
35 & more	4	7.1
Mean ±SD 27.55±5.04		
Gender		
Male	3	5.4
Female	53	94.6
Educational level		
Diploma	18	32.1
Technical institute of nursing	26	46.4
Bachelor degree of nursing	12	21.4
Marital Status		
Married	48	85.7
Divorce	1	1.8
Single	7	12.5
Years of experience		
>5	16	28.6
5 -	29	51.8
10 -	8	14.3
15 -	3	5.4
Attendance of burn training programs		
Yes	2	3.6
No	54	96.4

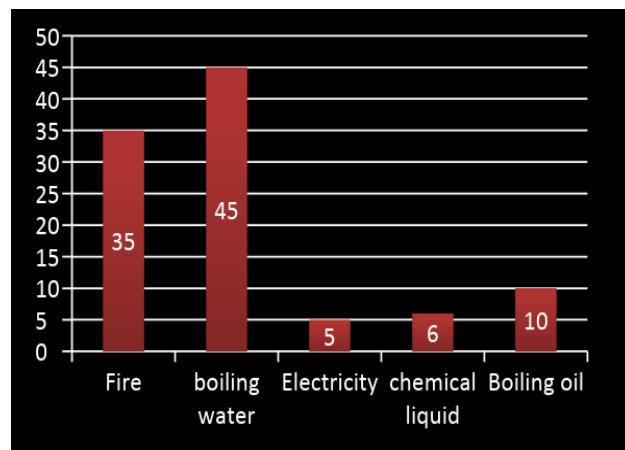


Figure (1); most common causes of burn injuries in children

Table (2): Percentage distribution of studied children clinical data

Clinical data	No (100)	%
Extent of body surface area		
Minor burn	17	17
Moderate burn	51	51
Sever burn	32	32
Degree of burn		
First	6	6
Second	51	51
Third	63	63
Time of burn		
At morning	34	34
At afternoon	55	55
At night	11	11
Pattern of burn		
Crime	5	5
Accident	95	95
Previous burn injury		
Yes	1	1
No	99	99
Mother action taken when burn occur		
Applied tap water	15	15
Using toothpaste	60	60
Using cooking oil	20	20
Using egg	5	5
Infection to wound		
Offsive odor at burn site	64	64
Hyperthermia	50	50
Nothing	6	6
Present of contracture		
Yes	55	55
No	45	45
length of hospital stay (days)		
1 - 14	34	34
15 - 29	59	59
30 - 44	6	6
45 - 60	1	1
Skin graft		
Yes	66	66
No	34	34

More than one answer

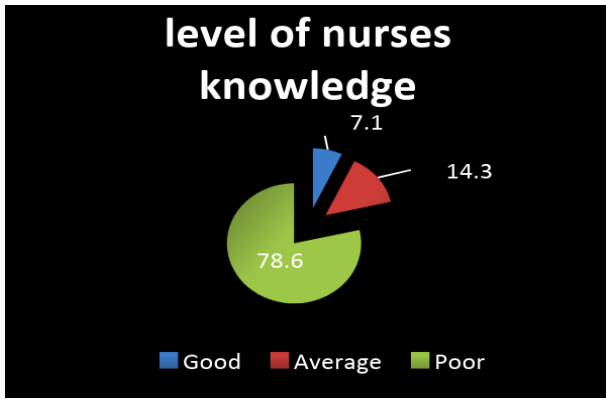


Figure (2): Total score of nurses' knowledge about burn and its management

Table (3); Total level of nurse's practice regarding care of children with burn injuries

variable	Level of practiceNo (56)			
	Competent		Incompetent	
	No	%	No	%
Wound dressing change	23	41.1	33	58.9
Infection control	1	1.8	55	98.2
Care of hypothermia	14	25	42	75
Care of hyperthermia	11	19.6	45	80.4
Care of pain	39	69.6	17	30.4
Discharge plan	20	35.7	36	64.3

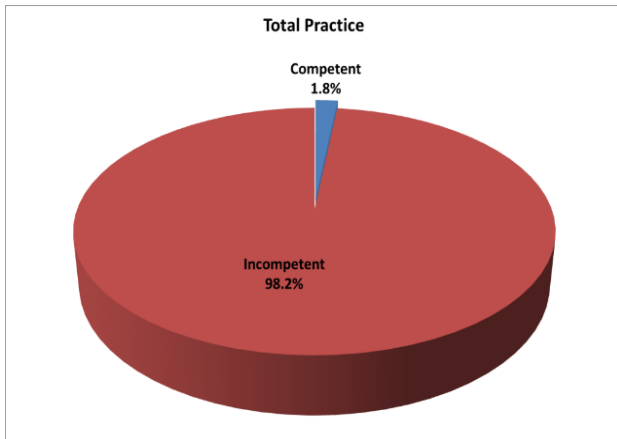


Figure (3): Total score of nurses' practice regarding care of burned children.

Table (4): Correlation between the total nurses' knowledge scores and their total practice score.

Item	Total knowledge scores	
	r	p
Practice scores	-0.05	0.67

Table (5): relationship between severity of burn among studied subjects and its causes as well as children outcome

Causes of burn	Severity of burn						Test of significance
	Minor		Moderate		Sever		
	No	%	No	%	No	%	X ² & P
Fire	5		19	37.3	13	41.9	X ² =3.8, 0.4
Boiling water	9	52.9	25	49	15	48.4	X ² =9.1, 0.05*
Electricity	0	0.0	1	2	0	0	X ² =2.8, 0.3
Boiling oil	3	17.6	6	11.8	4	9.7	X ² =3.9, 0.5
Alive (87)	7	7	53	60.1	27	31	X ² =19.9, 0.003*
Died (13)	0	0.0	2	15.3	11	84.6	

(*) statistically significant at p < 0.05

DISCUSSION

Education and training of all hospital staff is essential to increase their awareness about the importance of management of burn. Nurses should have training in burn management as a part of their education, and updated courses should be available for qualified staff as continuous and on-going process⁽¹⁵⁾. The findings of the current study showed that, the majority of nurses never attended any training programs about burn management. This result was in an agreement with **Abdallah (2013)**,⁽¹⁶⁾ who study "first aid and hospital care provided to burned children and the expected outcome in outpatient and burn unit at AlahratZagzig Hospital", and reported that, the majority of nurses did not attended any training program about burn management.

The current study revealed that, the majority of the studied children were accident burn, this result was in agreement with **Scheven, Barker and Govindasamy (2014)**⁽¹⁶⁾ who studied "the pattern of burns and the need of a health education programme within the setting of rural Kwa-zulu natal" and reported that most burns occurred at home as a result of hot water and food spillage which accounted for 69.5% of all burns, flame burns accounted for 19.6% and electrical burns formed 3.1% of all injuries. This is in agreement with the results of the present study which showed that most of burn injuries occur at home and more than half of studied children were burned due to hot fluids, more than one third were burned due to flame and only one child was burned due to electricity. This is attributed to children frequently playing in the house where kitchen is the commonest place of occurrence of burn injury where soup, boiling milk and hot water are the common sources of scalds among children without adequate supervision from parents. Moreover, children spend more time indoors especially in cold weather in which the use of traditional methods for heating.

The current study showed that most of studied children had second degree burns; while, more than half of them had third degree burn; and minority of them had first degree burn. This finding goes in harmony with **Odabasi, Tumer, Keten&Yorganci(2013)**⁽¹⁷⁾ who conducted a study in Turkey to "detect risk factors and prepare a program for prevention of burn injuries in children aged up to seven years" and founded that 20% of studied children had third degree burn and 80% of them had second degree burns.

Abd EL-lateef (2011)⁽¹⁸⁾ who "conducted designing, implementing and evaluating an educational program for prevention of infection in burn unit at Zagazig University" and reported that, total percent of nurses' knowledge before program was poor. In the current study, it was found that more than three quarter of the studied nurses had poor knowledge regarding burn and its' management.

The present study revealed that, two fifth of the studied nurses had competent practice about burn wound dressing, This result is supported by **Abd Allah (2013)**⁽¹⁶⁾ who found that nearly three quarter of studied nurses had competent practice regarding wound care. This result attributed to

nurses performs dressing daily to the patient to promote wound healing and prevent wound infection.

The current study revealed that, nurses had incompetent practice about infection control, This result was in harmony with **Abdel Kawy (2011)**,⁽¹⁹⁾ who studied “early management of burn in pediatric age group Cairo University” and reported that, the majority of nurses had unsatisfactory practice about infection control in burn management. This finding may be due to absence of supervision as well as lack of training program which was documented by the fact that, the high percentage of the studied nurses did not receive training about burn management.

The present study showed that the majority of studied nurses had incompetent practice regarding care of burned children. This finding was supported by **Chu, Barzii, Cheney, Harvery& Holland (2012)**⁽²⁰⁾ who founded more than half of studied nurses had unsatisfactory practice regarding care of burned children. This may be attributed to lack of training program regarding burn and its management

The present study showed that there was no statistical correlation between total nurses ‘knowledge score and practice score, this result may be due to that knowledge alone without practice had no effect. Knowledge may be easily gained but sufficient training, which is necessary to improve performance. Therefore, attending training educational programs are necessary for keeping knowledge up to date. This finding was supported by **Abd El- Aziz (2013)**⁽²¹⁾ who mentioned that no statistical significant correlation between total nurses ‘knowledge score and practice score. On the other hand, this finding is disagree with **Zaton (2013) & Ismael (2010)**^(22&23) who founded that positive statistical correlation between total nurses knowledge score and practice score.

It was clear from the current study that, there was statistical significant between severities of burn and children death and it was noticed that when the total body surface area burned increase the risk of children death increase. This finding was supported by **Abd Allah (2013)**⁽¹⁶⁾ who found that when the severity of burn increase the risk of burnt children burn increase. This may be attributed to the deterioration and complication that caused when severity of burn increase which leads to death of burnt children.

CONCLUSION

It could be concluded that majority of nurses never attended any previous training programs about burn management and there was Incompetent practice about infection control and wound dressing. Boys are more affected than girls as most of sample was boys where most of them were second and third degree burn which lead to increase length of stay in hospital. Also hospital care provided to burnt children by studied nurses was incompetent..

RECOMMENDATIONS

The following recommendations are to be considered:

- In service training programs for nurses directed toward all aspect of care provided to children with burn should be conducted.
- Mother’s class should be encouraged to provide them with knowledge regarding burn and skills regarding care of burn as well as preventive measure for burn accidents at home and environment.
- Mass media about first aid of all types of burn and Prevention of burn in suitable simple and attractive language is essential.
- Establishing a standard of care for children with burn in hospital and clinic is essential.

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