

## Knowledge and self-reported practice regarding prevention of joint contracture for patients with burn

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### Abstract

**Background:** Joint contractures are common problems after deep thermal burns. **Aim of the study:** was to assess Knowledge and self-reported practice for patients with burn to prevent joint contracture. **Subjects and methods: Research design:** A descriptive design was used. **Setting:** in specialized central hospital in Hehya, Sharkia Government, Egypt **Subjects:** Purposive sample of patients (55) with joint burn. **Tools of data collection:** Two tools were used, first tool was an interview questionnaire which included three parts: first part demographic characteristics for patients, second part Patient's medical history, third part to assess patient's knowledge regarding prevention of joint contracture. Second tool was patient's self-reported practice regarding prevention of joint contracture. **Results:** About 58.2% of studied patients their age >30 years old and 70.9% of studied patients were male. Also 80% of studied patients live in rural areas. The studied patients had unsatisfactory level of knowledge (21.8%) and unsatisfactory level of self-reported practice (30.9%) regarding prevention of joint contracture. There was a statistical significant relation between total level of patient knowledge and patient age ( $p=0.008$ ), level of education ( $p=0.022$ ) and occupation ( $p=0.016$ ). **Conclusion:** the present study was concluded that studied patients had unsatisfactory level of knowledge and practice regarding prevention of joint contracture. **Recommendation:** Educational programs should be launched to create mass awareness about prevention of joint contracture regarding patients with burn.

**Key words:** Joint Contracture, Burn, knowledge, Self-reported practice.

### Introduction

Burn is a thermal injury caused by biological, chemical, electrical and physical agents with local and systemic repercussions, these are the most severe form of trauma that has afflicted humanity since time immemorial and that over the years and the scientific revolution has improved the results in its treatment <sup>(1)</sup>.

Proper knowledge about burn first aid minimizes the overall impact of the injury <sup>(2)</sup>. Improper practices of burn first aid can have detrimental consequences. Ice is a common measure used by victims and first responders; ice increases the risk of hypothermia especially in larger surface area burns <sup>(3)</sup>.

Because of its etiology, burns are classified as electrical as electricity passes through the body; it meets resistance from the tissue. The smaller area of contact is more intense to heat and damage. Chemical alkaline substances cause more damage than acids. Frostbite this is caused by vasoconstriction of the peripheral blood vessels. Intra- and extracellular fluids freeze, forming crystals

that damage the tissues, also thermal flame, flash, steam, liquid and contact burns <sup>(4)</sup>.

Patients with severe burn will require fluid resuscitation, oxygen, cardiac monitoring, nasogastric tube, Foley-catheter, IV pain medication, tetanus booster and transfer to a burn center. If patients are being transferred to a burn center, simply cleaning and covering the burns without topical creams or ointments is all that is usually needed. It's best to contact the burn center for instructions <sup>(5)</sup>.

Deep partial or full-thickness burns if untreated, neglected, infected or managed conservatively can develop severe deformity and scar contracture in the joint with significant reduction in patient activities. Treatment strategy in burns is prevention of contractures rather than their management. Despite the advances in burn management protocols, there are many data supporting high incidence of joints contractures <sup>(6)</sup>.

The management of joint contractures presents a great challenge both for the orthopedic and the plastic

surgeons. Aggressive physiotherapy, Range of motion (ROM), manipulation, do daily activities for himself, splinting and various surgical methods; including scar release, tendon lengthening and osteotomies with skin graft, have been described for the treatment of joint contractures, with almost protracted morbidity in most of the cases<sup>(7)</sup>.

Self-reported practice is measurement tools are used to evaluate any self-perceived which involves asking a participant about their knowledge, practice, feelings, attitudes, and beliefs<sup>(8)</sup>.

### **Significance of the Study**

In different surgical wards and burn unit that the number of patients with burn was increasing and most of them are suffering from joint contracture (about 196 of patients). The statistical and medical records department at specialized central of burn in Hehya hospital, Sharkia government revealed that the number of patients who diagnosed with burn injury was increased in the following three years 2015, 2016, 2017 and consequently increased patient's hospital stay adding to hospital cost. Therefore, this study was conducted to assess factors affecting on joint contracture regarding patients with burn.

### **Aim of the study**

#### **The aim of the study was:**

To assess knowledge and self reported practice for patients with burn to prevent joint contracture.

#### **Research questions:**

Assess patients' knowledge regarding prevention of joint contracture.  
Determined practice regarding prevention of joint contracture.

#### **Subjects and methods:**

##### **Research design:**

A descriptive design was selected to fulfill the aim of the study and answer the research questions.

##### **Study Setting:**

The present study was conducted in departments at specialized central hospital in Hehya, Sharkia Government, Egypt male ward in the second floor which included 5 rooms with 10 beds, economy ward in the third floor which included 5

rooms with 10 beds, female ward in the fourth floor which included 6 rooms with 12 beds. There was three isolation rooms one room in each floor.

##### **Study Subjects:**

The study sample included purposive sample of patients with 2nd or 3th degree of joint burn. Total number of sample was 55 patients. Patients with severe co-morbidity diseases were excluded.

##### **Tools of data collection:**

The data of this study were collected using the following tools:

**Tool I:** Interviewing Questionnaire for patients: Was designed in Arabic form to avoid misunderstanding. It was developed by the researcher based on literature review<sup>(9)</sup> and opinions of expertise for content of validity. It consisted of 25 questions, divided into three parts: part 1 demographic characteristics, part 2 patient's medical history and part 3 patients' knowledge regarding prevention of joint contracture.

##### **The Scoring System:**

Scoring System of interview questionnaire consisted of given one for correct answer, and zero for incorrect. The total score was calculated for each patient by adding the score items of questionnaire. The patient had satisfactory level of knowledge when the total score equal or above 60%, and unsatisfactory when it below 60%. The 60% based on data collection and statistical analysis.

**Tool II:** patient self-reported practice regarding prevention of joint contracture cover first aid of burn and assess practice to prevent joint contracture: Designed in Arabic form to avoid misunderstanding. It was developed by the researcher based on literature review and opinions of expertise for content of validity<sup>(10)</sup>. Included two parts: first part included nine multiple choice questions to assess patients' practice regarding first aid of burn; Second part included 14 items to assess patients practice regarding prevention of joint contracture.

##### **Content Validity and reliability:**

It was established for assure of content validity by five a panel of expertise three in medical surgical nursing faculty of

nursing, zagazig university and two in emergency of critical care medicine faculty of medicine, zagazig university expertise's who revised the tools for clarity, relevance, comprehensiveness, understanding, and ease for implementation and according to the opinion of expertise. **Reliability was done by** Cronbach's Alpha test and retest for the tools was 0.801

### **Field work**

Field work of this study was executed in six months from November 2018 to April, 2019. During this stage all the data were collected by the researcher from the study patients. The first phase of the study is the preparatory phase that done by meeting with head of department to clarify the objective of the study and applied methodology.

The second phase that done by meeting all patients were given the same instruction, the researcher was interviewed personally with each of patients individually to fulfill the tools, and explaining the purpose of the study and their role in filled the tools, then giving them the questionnaire to fill it.

Interview questionnaire was done every day at the morning shift and afternoon. The time required for completion of one questionnaire was ranged from 30- 45 minutes.

### **Pilot Study:**

A pilot study for tools of data collection was carried out in order to test whether they are clear, understandable, and feasible and applicability. For this study, the researcher randomly selected six patients to participate in the pilot testing of the tools. Simple modify was done based on pilot results and the patients who shared in the pilot study excluded from the study

### **Administrative and ethical considerations.**

An official permission for data collection in specialized central hospital in Hehya was obtained from the hospital administrative personnel by the submission of a formal letter from the Dean of the faculty of Nursing.

Meeting and discussion were held between the researcher and the nursing administrative personnel to make them aware about the aims and objectives of the study, as well as , to get better cooperation during the implementation phase of the study, also patients consent were obtained before starting data collection. At the interview, each patient was informed about the purpose, benefits of the study, and they were informed that their participation is voluntary and they have right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the subjects were assured through coding of all data.

### **Statistical analysis**

After data collection, data were coded, entered and analyzed using SPSS (Statistical Package for Social Science) version 25. Qualitative data were presented as frequencies and percentages while, quantitative data were presented as mean, standard deviations. Quantitative variables of two independent normally distributed groups are compared with the student t test, while, comparison of paired data of pre and posttest done for the same groups are compared with paired t test. Multiple independent normally distributed groups were compared using analysis of variance (ANOVA test). P value ( $\leq 0.05$ ) was considered statistically significant difference.

### **Results:**

**Table 1:** Indicated demographic characteristics of the studied patients. It was showed that 58.2% of studied patients their age >30 years old with the mean  $\pm$  SD age  $32.9 \pm 9.4$ , 70.9% of studied patients were male and 61.8% of studied patients were married. Also 74.5% of studied patients were educated and 80% of studied patients living in rural areas. Also 52.7% of the studied patients were working.

**Table 2:** Revealed that studied patients had correct answer of knowledge regarding skin function, symptoms of burn, degree of burn and common site of burn (52.7%, 81.1%, 74.5% & 69.1%). Also table cleared that 46.8 of studied patients

their source of information about first aid was radio, television, medical magazines. The table also cleared that the total satisfactory level of knowledge of studied patients was 21.8%.

**Table 3:** Illustrated that the studied patients had satisfactory level of self-report practice about first aid for swallowed chemical material, contact to chemical material exposed to burn and putting something on burn (50.9%, 50.9%, 72.7%, 76.4%). The table also cleared that the total satisfactory level of self report practice of studied patients was 30.9%.

**Table 4:** Showed that there was a statistical significant relation between satisfactory level of patient's knowledge and age ( $p=0.008$ ), level of education ( $p=0.022$ ), and occupation ( $p=0.016$ ).

**Table 5:** Showed that there was no statistical significant relation between total satisfactory level of self report practice of studied patient and their demographic characteristics.

**Table 6:** Clarified that There was a statistical significant relation between satisfactory level of patient's knowledge and satisfactory level of self-report practice regarding when someone exposed to burn with P value =0.016.

**Table 7:** Illustrated that there was a statistical significant relation between level of self-report practice and knowledge regarding Skin layers with P value = 0.024, Outer layers of skin with P value = 0.006 and Inner layer of skin with P value =0.006 and sign of infection with P value =0.026.

## Discussion

The study sample consisted of 55 patients with joint burn in inpatient in specialized central hospital in Hehya. Nearly more than two thirds of studied patients were male and their age ranged from 18-55 with mean  $32.9\pm 9.4$ . This result might be explained from the researcher point of view by the fact that early males are generally active and therefore they are exposed to hazardous situations at both home and work. These agree with Walsh, Kishk and Ghareeb,<sup>(11)</sup> who reported in thesis entitled "Treatment of postburn axillary contracture

in ghana", that more than half of patients were male, The ages of patients ranged from 7 to 46 years. In the same line with, Saaq et al.,<sup>(12)</sup> who found in thesis entitled "The Menace of post-burn contractures: A developing country's perspective in pakistan" that more than half of patients were males and their age ranged from 16-55.

The present study revealed that nearly the majority of patients had unsatisfactory level of knowledge regarding prevention of joint contracture. This might be due to lack of community based education related to burn injury. This agree with Lam and Dung<sup>(13)</sup> who reported in thesis entitled "First aid and initial management for childhood burns in Vietnam – an appeal for public and continuing medical education" in Vietnam that community first aid knowledge for burns is rather limited especially developing and underdeveloped countries.

In the present study, nearly more than two third of the studied patients had unsatisfactory level of practice regarding prevention of joint contracture. This might be due to less encouragement of students to conduct health education for burn prevention and first aid management. Also media not develop programs for burn awareness to increase the people knowledge regarding the importance of physical exercise, range of motion and healthy diet. This agrees with Lam et al.,<sup>(14)</sup> who reported in thesis entitled "To evaluate first aid knowledge on burns management amongst high risk groups in Australia" that only one third of total participants were aware of first aid procedures for burns injury management.

Concerning the type of burn injury, the result of the present study revealed that common causes of burn about half of studied patients is flame followed by boiled water. From the researcher point of view this may be explained that kerosene and gas are the most frequent fuels in houses and work places and careless handling of gas pipes without safety features and accidental hand grenades and firing. Results were in relation with Mody, et al<sup>(15)</sup> who reported in thesis entitled "Post Burn Contracture Neck: Clinical Profile

and Management in USA" that 'contractures' were caused by flame burns, in most of patients.

The current study revealed that the majority of studied patients were exposed to home accident. This might be due to living in rural areas with the least available resources. They are exposed to burn hazards such as lack of smoke detectors, cigarette smoking, household overcrowding or People go to asleep without switching off the gas supply lines of their heaters, but once the gas supply returns it accumulates in the closed room. A gas blast occurs when someone lights a match stick or switches on some electric device in the morning. This agrees with Mody et al., <sup>(15)</sup> who reported that accidental flame burn was the commonest etiology.

The present study stated that about one third of studied patients had cervical joint burn followed by knee joint, elbow joint, and wrist joint. This agrees with Saaq et al., <sup>(12)</sup> who clarified that among the body areas affected, the commonest contracture was of the neck, followed by axilla, fingers/hand, elbow, knee and ankle/ foot, and more than one third of studied patients had more than one contracture.

The current study revealed that nearly the majority of studied patients had second degree of burn. From the researcher point of view these finding may lead to increased hospital stay, and emergency department visits. This agrees with Al-Hayder et al., <sup>(16)</sup> who reported in thesis entitled "Use of autologous fat grafting for the correction of burn scar contracture in the hand: a case report in China" that severity of burn is moderate.

The result of the present study revealed that more than half of the burn patients were suffering from mainly infection, which is a local and systemic sign as fever, purulent exudates and bad odor. This could be explained by auto infection and from environment contamination which include linen, bed, other patients or visitors and also may be from hospital staff during dealing with patients and open wounds, could not use aseptic techniques observed by researcher during collection of the data.

The study results were in agreement with Sulaiman et al., <sup>(17)</sup> reported in thesis entitled "Antibacterial susceptibility of bacteria isolated from burns and wounds of cancer patients Saudia", that burned patients are at a high risk for nosocomial infections by multi resistant bacteria, a large proportion of which are gram negative. Within 24 h, burned patients can start suffering from opportunistic bacterial attacks that can vary from simple infections, such as those easily treatable by antibiotics to more complicated bacteria, which may have natural or acquired resistance to drugs. Infection by multiple drug resistant bacteria could create additional complexity to the problem.

Smeltzer et al., <sup>(18)</sup> identified that regular pain relief is essential, in particular prior to all interventions such as change of dressing and exercise; this needs to be given in adequate time to take effect before commencing the procedure. The aim of analgesic drugs should be to develop a good baseline pain control to allow functional movement and activities of daily living to occur at any time during the day. Inadequate pain relief in the early stages can result in a complete reluctance of the patient to participate in their rehabilitation in both the short and long term.

The results were in agreement with Walsh et al., <sup>(11)</sup> who observed that Almost all the studied cases showed a history of no or minimal physiotherapy and splinting of the axilla in the acute phase. From the researcher point of view that the effect of exercise on joint mobility and range of motion may contribute to the reduced number of corrective surgical procedures. Al-Hayder et al., <sup>(16)</sup> said that patients who are unable to move should have passive movements completed to maintain range of movement (ROM) and prevent stiffness developing.

The present study revealed that there was statistical significance relation between satisfactory level of patient knowledge and age, level of education and occupation. The results were in agreement with Yolcu et al., <sup>(19)</sup> who identified in thesis entitled " Emergency service admissions of patients with burn injury" in

Turkiyes that there was a significant relation between mechanism of burn injury with age groups. Age group and hospitalization were positively correlated. Age group and TBSA are positively correlated.

The present study revealed that there was no statistical significant relation between total satisfactory level of practice of studied patient and their demographic characteristics. Results were in agreement with Yolcu, et al., <sup>(19)</sup> who reported that gender was not related with hospitalization and TBSA.

**Conclusion**

Based on the results of the current study, it was concluded that the studied patients had unsatisfactory level of knowledge and self-reported practice regarding preventing of joint contracture.

**Recommendations**

Based on the results of the present study recommended that: Educational programs should be launched to create mass awareness about prevention of joint contracture regarding patients with burn. Further studies should be done on large sample of population.

**Table 1: Demographic Characteristics of studied patients (n=55)**

<b>Demographic Characteristics</b>	<b>NO</b>	<b>%</b>
<b>Age (years):</b>		
• ≤30	23	41.8
• >30	32	58.2
• Range	18-55	
• Mean± SD	32.9±9.4	
• Median	33	
<b>Gender</b>		
• Male	39	70.9
• Female	16	29.1
<b>Marital status:</b>		
• Single	21	38.2
• Married	34	61.8
<b>Education :</b>		
• Educated	41	74.5
• Not educated	14	25.5
<b>Occupation :</b>		
• Working	29	52.7
• Not working	26	47.3
<b>Residence</b>		
• Rural	44	80.0
• Urban	11	20.0

**Table 2:- Frequency distribution and percentage of correct patient's knowledge about burn (n=55)**

Knowledge about burn	Correct	
	No	%
Skin layers	22	40.0
Outer layer of skin	12	21.8
Inner layer of skin	13	23.6
Skin function	29	52.7
Burn definition	24	43.6
Causes of burn	1	1.8
Symptoms of burn	45	81.8
Degree of burn	41	74.5
Sign of 1 <sup>st</sup> degree burn	17	30.9
Sign of 2 <sup>nd</sup> degree burn	17	30.9
Sign of 3 <sup>rd</sup> degree burn	11	20.0
Common site of burn	38	69.1
Complications of burn	1	1.8
Sign of infection	14	25.5
Diet needed during burn	17	30.9
Sources of information about first aid (n=47):		
• Radio, television ,medical magazines	22	46.8
• Relatives	12	25.5
• Colleagues in work	10	21.3
• Others	3	6.4
Total satisfactory knowledge ≥60%	12	21.8

**Table 3:- Frequency distribution of patient self report practice about burn (n=55)**

Patient's self report practice regarding first aid for burn	Patient practice	
	No.	%
Exposed to boiled fluid	17	30.9
Exposed to electric burn	1	1.8
Swallowed chemical material	28	50.9
Contact to chemical material	28	50.9
Exposed to burn	40	72.7
Putting something on burn	42	76.4
Total satisfactory self report practice ≥60%	17	30.9

**Table 4: Relation between total knowledge and demographic characteristics of studied patient (no=55).**

Demographic Characteristics	Unsatisfactory (No.=43)		Satisfactory (No.=12)		X2	p.value
	No.	%	No.	%		
<b>Age (years):</b>						
• ≤30	14	32.6	9	75.0	6.946	0.008*
• >30	29	67.4	3	25.0		
<b>Gender</b>						
• Male	28	65.1	11	91.7	3.206	0.073
• Female	15	34.9	1	8.3		
<b>Marital status:</b>						
• Single	14	32.6	7	58.3	2.641	0.104
• Married	29	67.4	5	41.7		
<b>Education :</b>						
• Educated	29	67.4	12	100.0	5.241	0.022*
• Not educated	14	32.6	0	0.0		
<b>Occupation</b>						
• Working	19	44.2	10	83.3	5.768	0.016*
• Not working	24	55.8	2	16.7		
<b>Residence</b>						
• Rural	35	81.4	9	75.0	0.24	0.624
• Urban	8	18.6	3	25.0		

X2=Chi-square test

\* =significant P ≤ 0.05

**Table 5: Relation between total self-report practice and demographic characteristics of studied patient (n=55).**

Demographic Characteristics	Unsatisfactory (No.=38)		Satisfactory (No.=17)		X2	p.value
	No.	%	No.	%		
<b>Age (years):</b>						
≤30	18	47.4	5	29.4	1.557	0.212
>30	20	52.6	12	70.6		
<b>Gender</b>						
Male	25	65.8	14	82.4	1.562	0.211
Female	13	34.2	3	17.6		
<b>Marital status:</b>						
Single	25	65.8	6	35.3	0.087	0.768
Married	13	34.2	11	64.7		
<b>Education :</b>						
Educated	29	76.3	12	70.6	0.203	0.652
Not educated	9	23.7	5	29.4		
<b>Occupation</b>						
Working	23	60.5	6	35.3	3.0	0.083
Not working	15	39.5	11	64.7		
<b>Residence</b>						
Rural	28	73.7	16	94.1	3.065	0.08
Urban	10	26.3	1	5.9		

X2=Chi-square test

**Table 6: Relation between total knowledge and self report practice among studied patient (n=55).**

First aid practice	knowledge				X2	p.value
	Unsatisfactory (No.=43 )		Satisfactory (No.=12 )			
	No.	%	No.	%		
<b>Exposed to boiled fluid</b>						
Unsatisfactory	27	62.8	11	91.7	3.663	0.056
Satisfactory	16	37.2	1	8.3		
<b>Exposed to electric burn</b>						
Unsatisfactory	42	97.7	12	100.0	0.284	0.594
Satisfactory	1	2.3	0	0.0		
<b>Swallowed chemical material</b>						
Unsatisfactory	20	46.5	7	58.3	0.525	0.469
Satisfactory	23	53.5	5	41.7		
<b>Contact to chemical material</b>						
Unsatisfactory	19	44.2	8	66.7	1.897	0.168
Satisfactory	24	55.8	4	33.3		
<b>Exposed to burn</b>						
Unsatisfactory	15	34.9	0	0.0	5.756	0.016*
Satisfactory	28	65.1	12	100.0		
<b>Putting something on burn</b>						
Unsatisfactory	11	25.6	2	16.7	0.413	0.52
Satisfactory	32	74.4	10	83.3		
<b>Total satisfactory ≥60%</b>						
Unsatisfactory	27	62.8	11	91.7	3.663	0.056
Satisfactory	16	37.2	1	8.3		

X2=Chi-square test

\* =significant P ≤ 0.05

**Table 7: Relation between total self report practice and knowledge among studied patient (no=55).**

Knowledge	Self report practice				X2	p.value
	Unsatisfactory (No.=38)		Satisfactory (No.=17)			
	No.	%	No.	%		
<b>Skin layers</b>						
Unsatisfactory	19	50.0	14	82.4	5.123	0.024*
Satisfactory	19	50.0	3	17.6		
<b>Outer layers of skin</b>						
Unsatisfactory	26	68.4	17	100.0	6.867	0.006*
Satisfactory	12	31.6	0	0.0		
<b>Inner layer of skin</b>						
Unsatisfactory	25	65.8	17	100.0	7.616	0.006*
Satisfactory	13	34.2	0	0.0		
<b>Skin function</b>						
Unsatisfactory	21	55.3	5	29.4	3.149	0.076
Satisfactory	17	44.7	12	70.6		
<b>Burn definition</b>						
Unsatisfactory	23	60.5	8	47.1	0.866	0.352
Satisfactory	15	39.5	9	52.9		
<b>Causes of burn</b>						
Unsatisfactory	38	100.0	16	94.1	2.277	0.131
Satisfactory	0	0.0	1	5.9		
<b>Symptoms of burn</b>						
Unsatisfactory	9	23.7	1	5.9	2.502	0.114
Satisfactory	29	76.3	16	94.1		
<b>Degree of burn</b>						
Unsatisfactory	8	21.1	6	35.3	1.255	0.263
Satisfactory	30	78.9	11	64.7		
<b>Common site of burn</b>						
Unsatisfactory	9	23.7	8	47.1	3.005	0.083
Satisfactory	29	76.3	9	52.9		
<b>Sign of infection</b>						
Unsatisfactory	25	65.8	16	94.1	4.967	0.026*
Satisfactory	13	34.2	1	5.9		
<b>Total satisfactory knowlege ≥60%</b>						
Unsatisfactory	27	71.1	16	94.1	3.663	0.056
Satisfactory	11	28.9	1	5.9		

X2=Chi-square test

\*\*=highly significant p. value <0.001

\* =significant P ≤ 0.05

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