

## Relationship between Dependency Level among Burned Patients and Different Burn Parameters

Wafaa N. Ahmed Besely, Amna Y. Saad, Thanaa M. A. Alaa-Eldeen

Medical Surgical Nursing, Faculty of Nursing, Alexandria University.  
[Wafaa\\_besely70@yahoo.com](mailto:Wafaa_besely70@yahoo.com)

**Abstract:** Burn injuries contribute significantly to morbidity and mortality in developing countries. Outcomes are made worse by a lack of resources, which contribute to unacceptably high level of complications, such as wound infection, contractures and death. Although the earlier phases of burn care didn't specifically focus on rehabilitation, rehabilitation begins as the patient enters the health care system and may extend for years following major burn injury. Attention to nutrition, activity and psychological status continues to increase the independency level in performing the activities of daily living. Careful assessment skills are essential to evaluate the effects of treatment method on the healing of burn wound and dependency level of burned patient. **The aim** of the study is to determine the relationship between dependency level among burned patients and different burn parameters. The study was carried out in the burn unit of the Main University Hospital in Alexandria. The assessment questionnaire sheet was developed which comprised three parts: socio-demographic data of the studied subjects, parameters of burn injury and activities of daily living. **Results:** The study revealed that there was a significant difference between the most of daily activities of daily living and different burn parameters. **In conclusion**, this study showed that there were a highly significant difference between the most of activities of daily living and different burn parameters.

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### 1. Introduction:

Burn is an injury cause destruction of skin and underlying tissue. All over the world burn injuries are common and 80% of burns occur at home. Post burns complications are severe. Burn affects the mobility of major joints of limbs which may restrict and affects day to day activities.<sup>(1)</sup>

Burn patients often feel a sense of loss of role and ability to participate in normal activities of life. Activities of daily living play an extremely important role in a burn patient's successful outcome. Consistent and often repetitive education is a vital part of nursing care. Edema management, respiratory management, positioning, and engaging patients in functional activities and movement must start immediately if a patient can accept the responsibility of self exercise and activities of daily living, then the most difficult aspects of rehabilitation are easily achieved. If there is suspected tendon damage from the burn, then protected movement is appropriate and resting splints may be necessary. It is crucial to involve patients in daily activities such as eating and washing themselves as soon as possible. Highest levels of independence should be encouraged in all activities of daily living from as early as possible.<sup>(2,3)</sup>

The rehabilitation for patients with burn injuries starts from the day of injury, lasting for several years and requires multidisciplinary efforts. It is not something which is completed by one or two individuals but should be a team approaches,

incorporating the patient and when appropriate, their family. Burns can leave a patients with severely debilitating and deforming contractures, which can lead to significant disability when left untreated.<sup>(4,5)</sup>

Participation in their own cares quickly gives the patient an increased sense of wellbeing and control over their environment. Increased ability to perform activities of daily living leads to increase in self-esteem, self-worth and sense of independence and leads to increased motivation levels and desire to improve. Bathing, toileting, feeding, grooming, dressing and vocational skills also incorporate therapeutic goals, for example increased ROM and strength, fine motor activities and balance.<sup>(6,7)</sup>

Many services should be provided to adult burn victims whose ability to cope with the tasks of daily living is threatened or impaired by burn injuries. These services may include assessment and training in activities of daily living; hand function skills; prosthetics; environmental alterations; positioning techniques; visual, perceptual and cognitive skills; orthotics training; and use of many adaptive equipment.

### 2. Materials and Method

#### Materials

A descriptive correlative study research design was used to determine the relationship between dependency level and different burn parameters.

#### Setting

This study was carried out in the burn unit of the main university hospitals in Alexandria.

### Subjects

The subjects of this study comprised 50 patients admitted to burn unit suffering from second and third degree of burn at any part of the body.

### Included criteria:

The patients were selected according to the following criteria:

- Adult of both sexes
- Able and willing to communicate and cooperate
- Newly admitted with recent moderate burn injury which includes second and third degree burn of 15% to 25% TBSA (total body surface area).
- Hemodynamic stability.

**Tools of the study:** Assessment questionnaire sheet was developed based on the review of current national and international literature by the researchers to determine the relationship between the dependency level and different burn parameters. This tool comprised of three parts:

#### Part I:

Socio-demographic data of the studied subjects such as name, age, sex, area of residence, Social status, level of education, occupation before injury, and economic status.

#### Part II:

Parameters of burn injury this part included items related to duration of burn injury, place of occurrence, causes of burn injury, circumstances of injury, sites of burn, total body surface area, degree of burn injury, classification of burn severity, treatment, local complications and deformity associated with burn injury.

#### Part III:

Activities of daily living check list using the two activities of daily living scales; Katz scale of basic activity of daily living and Lawton scale of instrumental activities of daily living scale "IADLs".

The third part was developed to assess the activities of daily living to determine the relationship between dependency level and different burn parameters. It included 11 activities namely feeding, dressing, grooming, bathing, sitting activities, transferring, standing, walking, toileting, opening doors and hand function.

Each of these activities was divided into several tasks as follows:

- **Feeding** (Get food from plate into the mouth, cutting of meat, cutting of bread, feed self),
- **Dressing** (Gets clothes from closets and drawers, able to take off clothes, able to wear clothes)
- **Grooming** (Comb hair, brush teeth)
- **Bathing** (get in tube, bathing self, get out of tube bath).

- **Sitting activities:** From lying in bed to sit on the edge of the bed, from sitting to standing, from standing to sitting on chair.
- **Transferring:** (Moves in and out of bed, moves in and out of chair).
- **Standing:** (Rising from a chair, standing balance more than one minute).
- **Walking :**( walks on level surface unassisted 10 steps forward, return back).
- **Toileting:** (goes to toilet, gets on and off, clean self after elimination, arrange clothes).
- **Hand function :**( signing the name eating with utensils, tying) picking up coins from a flat surface.

Each task was graded on its level of dependence utilized scale ranged from completely dependent (0), partially dependent (1), independent (2).

Scores allotted to each task for every activity were then added together for each patient, then their mean and standard deviation was estimated.

**Method:** Permission to carry out the study was obtained from the responsible authorities of the Alexandria main university hospital after providing an explanation of the aim of the study.

1. Assessment questionnaire sheet was based on using the two activities of daily living scales; Katz scale of basic activity of daily living and Lawton scale of instrumental activities of daily living scale "IADLs" and partially modified by the researcher based on the reviewing of literature.
2. The tool was tested for content validity, completeness of the items by 5 experts in the nursing and medical field to test the tool for content validity, completeness, and the clarity of the items. Accordingly, all necessary modifications were done.
3. Tool was tested for its reliability using the Cronbach's alpha where it was (0.945).
4. A pilot study was conducted on five patients, to test clarity, visibility and applicability of the tool.
5. Patient's consent for participations was obtained to carry out the study and each patient was informed about the purpose of the study.
6. Newly admitted patients with moderate burn injuries of second and third degree burn at any site of the body and willing to participate in the study were taken.
7. Data were connected within three months.
8. Each patient was interviewed individually to establish rapport and to ensure the confidentiality of the collected data.
9. Burn related items were assessed by observation, examination of the burn injury and from the patient's hospital file.

10. Self-care abilities and activities of daily living (ADLS) were assessed in the morning feeding, dressing, grooming, bathing, sitting activities, transferring, standing walking, toileting, opening doors and activities of hand function.

#### Statistical analysis

- The data was checked for correction of any errors during data entry.
- SPSS program version 13 was used for data presentation (tables, graphs and mathematical presentation and statistical analysis.
- Numbers and percents were used for presenting qualitative variables.
- A score > 65% was considered satisfactory.
- A score ≤ 65% was considered unsatisfactory.

#### 3. Results

Table (1): shows the distribution of studied subjects according to Sociodemographic data.

Regarding the age, more than half of the studied sample was in the age group 21-30 years. As regards to the sex, most of patients were males 70%. Concerning residence 70% of patients were from urban. Also, this table showed that 64% of patients were married, 34% were perform manual work, 44% of patients had (3-4) persons in family and 52% of patients live in three rooms. Moreover, this table showed that family income less than enough in 84% of patients.

Table (2): shows the distribution of studied subjects according to parameters of burn injury.

Regarding the duration of injury, 56%, of patients were assessed after (10-20) days of injury. As regards places of occurrence (62%) of injuries occurs at home. Concerning causes of burn 82% of injuries were from flam burn. Also, it was found that 88% of injuries were accidental with the majority occurs at sites of right hand, left hand (72%), right lower arm (52%), right upper arm (46%), left lower arm (44.5%), left upper arm (36%) and anterior trunk (44%).

This table revealed that the majority of the studied subjects had second and third degree of burn (58%, 40% respectively). As regards to the depth of burn injury (51.6%) of the studied subjects had superficial partial thickness burn, (40.3%) of subjects had deep partial thickens burn. Concerning classification, this results revealed that (36%) of studied subjects were classified as major, (34%) were minor and (30%) were moderate.

Also, it was found that 83.6% of the studied subjects were receiving conservative treatment, 26% of patients had contractures and 8% had hypertrophic scores. Moreover, the results revealed that 67.3% of patients had no deformity and 48% of patients need psychological rehabilitation.

Table (3): describes the distribution of studied subjects according to activities of daily living.

**Table (1): Distribution of studied subjects according to Socio demographic data (n = 50)**

	No.	%
<b>Age</b>		
21 – 30	33	66.0
31 – 40	6	12.0
41 - 50	4	8.0
>50	7	14.0
Min. – Max	21.0 – 66.0	
Mean ± SD	32.57 ± 11.38	
<b>Sex</b>		
Male	35	70.0
Female	15	30.0
<b>Residence</b>		
Rural	15	30.0
Urban	35	70.0
<b>Social status</b>		
Single	18	36.0
Married	32	64.0
Widow	0	0.0
Divorced	0	0.0
<b>Level of education</b>		
Illiterate	20	40.0
Read and write	6	12.0
Primary	4	8.0
Preparatory	5	10.0
Secondary	13	26.0
University	2	4.0
<b>Occupation before injury</b>		
Professional work	4	8.0
Manual work	17	34.0
House wife	20	40.0
No work	9	18.0
<b>Social and economic status</b>		
<b>Number of persons in family</b>		
1 - 2	5	10.0
3 - 4	22	44.0
5 – 6	11	22.0
> 6	12	24.0
<b>Number of rooms in house</b>		
One room	3	6.0
Two room	15	30.0
Three room	26	52.0
> Three room	6	12.0
<b>Family income</b>		
Less than enough	42	84.0
Enough	7	14.0
Enough and more	1	2.0
Enough and save money	0	0.0

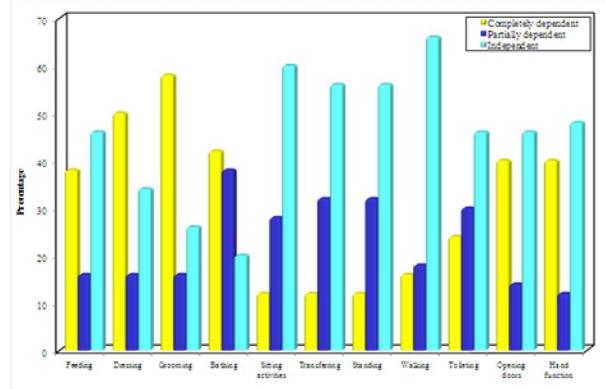
It was noticed that most of activities were performed independently by less than (50%) of the studied subjects except sitting, transferring, standing and walking were performed just by (60%, 56%, 56%) and (66%) of the studied subjects respectively.

**Table (2): Distribution of studied subjects according to Parameters of burn injury (n = 50)**

	No.	%
<b>Duration of injury</b>		
4 - 10	19	38.0
10 - 20	28	56.0
21 - 30	3	6.0
Min. - Max.	2.0 - 26.0	
Mean ± SD	11.98 ± 6.28	
<b>Place of occurrence</b>		
Home	31	62.0
Work	10	20.0
Street	9	18.0
<b>Causes of burn</b>		
Flame	41	82.0
Flash	0	0.0
Steam	0	0.0
Hot fluids	3	6.0
Strong acid	2	4.0
Strong alkaline	0	0.0
Electrical	4	8.0
<b>Circumstances of injury</b>		
Accidental	44	88.0
Suicidal	6	12.0
<b>Sites of burn</b>		
Head	5	10.0
Neck	14	28.0
Anterior trunk	22	44.0
posterior trunk	12	24.0
Right upper arm	23	46.0
left upper arm	18	36.0
Right hand	36	72.0
Left hand	36	72.0
Right lower arm	23	52.0
left lower arm	22	44.5
Right thigh	18	36.0
left thigh	18	36.0
Right leg	8	16.0
Left leg	5	10.0
Right foot	4	8.0
Left foot	4	8.0
Face	5	10.0
Abdomen	4	8.0
<b>Total body surface area %</b>		
Min. - Max.	2.0 - 35	
Mean ± SD	20.46 ± 8.12	
<b>Degree of burn injury</b>		
Second	30	60.0
Third	20	40.0
<b>Depth of burn injury</b>		
Superficial	0	0.0
Superficial partial thickness	32	51.6
Deep partial thickness	25	40.3
Full thickness	5	8.1
<b>Classification of burn severity</b>		
Second degree burn 2-15%	32	64
Third degree burn 25%	18	36.0
<b>Treatment</b>		
Conservative	46	83.6
Surgical (skin graft)	6	10.9
Plastic surgery	3	5.5
<b>Local complication</b>		
Hypertrophic scars	4	8.0
Contractures	13	26.0
No complications	33	66.0
<b>Deformity associated with burn injury</b>		
Deformity in hands	13	25.0
Deformity in feet	4	7.7
No deformity	35	67.3
<b>Needs psychological rehabilitation</b>		
Yes	24	48.0
No	26	52.0

**Table (3): Distribution of studied patients according to dependency level in performing activities of daily living (n = 50)**

	Completely dependent		Partially dependent		Independent	
	N.	%	No.	%	No.	%
<b>1. Feeding</b>	19	38.0	8	16.0	23	46.0
<b>2. Dressing</b>	25	50.0	8	16.0	17	34.0
<b>3. Grooming</b>	29	58.0	8	16.0	13	26.0
<b>4. Bathing</b>	21	42.0	19	38.0	10	20.0
<b>5. Sitting activities</b>	6	12.0	14	28.0	30	60.0
<b>6. Transferring</b>	6	12.0	16	32.0	28	56.0
<b>7. Standing</b>	6	12.0	16	32.0	28	56.0
<b>8. Walking</b>	8	16.0	9	18.0	33	66.0
<b>9. Toileting</b>	12	24.0	15	30.0	23	46.0
<b>10. Opening doors</b>	20	40.0	7	14.0	23	46.0
<b>11. Hand function</b>	20	40.0	6	12.0	24	48.0



**Figure (1): Distribution of studied patients according to dependency level in performing activities of daily living**

Table (4): reveals the relationship between subjects of burn and activities of daily living. This table revealed a highly significant difference between causes of burn injury and feeding, dressing, grooming, opening doors and perform hand function. These activities were (0.001), (0.49), (0.021), (0.013) respectively.

Table (5): presents the relationship between circumstances of injury and activities of daily living.

It was noticed that there was only a highly significant difference in toileting (0.037).

Table (4): reveals the relationship between subjects of burn and activities of daily living.

This table revealed a highly significant difference between causes of burn injury and feeding, dressing, grooming, opening doors and perform hand function. These activities were (0.001), (0.49), (0.021), (0.013) respectively.

Table (5): presents the relationship between circumstances of injury and activities of daily living.

It was noticed that there was only a highly significant difference in toileting (0.037).

Table (6): presents the relationship between degree of burn injury and activities of daily living.

This table revealed a highly significant difference between degree or burn injury and all activities of daily living.

Table (7): shows the relationship between local complication of injury and activities of daily living.

It was found that there were a highly significant difference between local complication of injury and most of activities (feeding, bathing, toileting, opening doors and hand function).

Table (8): shows the relationship between needs of psychological rehabilitation and activities of daily living.

It was found a highly significant difference between needs for psychological rehabilitation and most of activities of daily living feeding, dressing, grooming, bathing, toileting, opening doors and hand function activities.

Table (9): shows the relationship between site of burn and the dependency level in performing activities of daily living.

It displays a highly significant difference between the site of burn and the dependency level in performing most of activities.

**Table (4): Relationship between causes of burn and dependency level in performing activities of daily living**

	Causes of burn								MCp
	Flam		Hot fluids		Strong acid		Electrical		
	No.	%	No.	%	No.	%	No.	%	
<b>Feeding</b>									
Completely dependent	17	41.5	2	66.7	0	0.0	0	0.0	<0.001*
Partially dependent	3	7.3	0	0.0	2	100.0	3	7.5	
independent	21	51.2	1	33.3	0	0.0	1	25.0	
<b>Dressing</b>									
Completely dependent	21	51.2	2	66.7	2	100.0	0	0.0	0.049*
Partially dependent	5	12.2	0	0.0	0	0.0	3	75.0	
independent	15	36.6	1	33.3	0	0.0	1	25.0	
<b>Grooming</b>									
Completely dependent	25	61.0	2	66.7	2	100.0	0	0.0	0.049*
Partially dependent	5	12.2	0	0.0	0	0.0	3	75.0	
independent	11	26.8	1	33.3	0	0.0	1	25.0	
<b>Bathing</b>									
Completely dependent	19	46.3	2	66.7	0	0.0	0	0.0	0.199
Partially dependent	13	31.7	1	33.3	2	100.0	3	75.0	
independent	9	22.0	0	0.0	0	0.0	1	25.0	
<b>Sitting activities</b>									
Completely dependent	6	14.6	0	0.0	0	0.0	0	0.0	0.182
Partially dependent	10	24.4	3	100.0	0	0.0	1	25.0	
independent	25	61.0	0	0.0	2	100.0	3	75.0	
<b>Transferring</b>									
Completely dependent	6	14.6	0	0.0	0	0.0	0	0.0	0.258
Partially dependent	12	29.3	3	100.0	0	0.0	1	25.0	
independent	23	56.1	0	0.0	2	100.0	3	75.0	
<b>Standing</b>									
Completely dependent	6	14.6	0	0.0	0	0.0	0	0.0	0.258
Partially dependent	12	29.3	3	100.0	0	0.0	1	25.0	
independent	23	56.1	0	0.0	2	100.0	3	75.0	
<b>Walking</b>									
Completely dependent	8	19.5	0	0.0	0	0.0	0	0.0	0.976
Partially dependent	7	17.1	1	33.3	0	0.0	1	25.0	
independent	26	63.4	2	66.7	2	100.0	3	75.0	
<b>Toileting</b>									
Completely dependent	10	24.4	2	66.7	0	0.0	0	0.0	0.388
Partially dependent	14	34.1	0	0.0	0	0.0	1	25.0	
independent	17	41.5	1	33.3	2	100.0	3	75.0	
<b>Opening doors</b>									
Completely dependent	18	43.9	2	66.7	0	0.0	0	0.0	0.021*
Partially dependent	4	9.8	0	0.0	0	0.0	3	75.0	
independent	19	46.3	1	33.3	2	100.0	1	25.0	
<b>Hand function</b>									
Completely dependent	18	43.9	2	66.7	0	0.0	0	0.0	0.013*
Partially dependent	3	7.3	0	0.0	0	0.0	3	75.0	
independent	20	48.8	1	33.3	2	100.0	1	25.0	

MCp: p value for Monte Carlo tes; \*: Statistically significant at  $p \leq 0.05$

**Table (5): Relationship between circumstances of burn injury and the dependency level in performing the activities of daily living.**

	Circumstances				MCp
	Accidental		Suicidal		
	No.	%	No.	%	
<b>Feeding</b>					
Completely dependent	14	31.8	5	83.3	0.078
Partially dependent	8	18.2	0	0.0	
independent	22	50.0	1	16.7	
<b>Dressing</b>					
Completely dependent	20	45.5	5	83.3	0.284
Partially dependent	8	18.2	0	0.0	
independent	16	36.4	1	16.7	
<b>Grooming</b>					
Completely dependent	24	54.5	5	83.3	0.576
Partially dependent	8	18.2	0	0.0	
independent	12	27.3	1	16.7	
<b>Bathing</b>					
Completely dependent	17	38.6	4	66.7	0.544
Partially dependent	18	40.9	1	16.7	
independent	9	20.5	1	16.7	
<b>Sitting activities</b>					
Completely dependent	6	13.6	0	0.0	1.000
Partially dependent	12	27.3	2	33.3	
independent	26	59.1	4	66.7	
<b>Transferring</b>					
Completely dependent	6	13.6	0	0.0	1.000
Partially dependent	14	31.8	2	33.3	
independent	24	54.5	4	66.7	
<b>Standing</b>					
Completely dependent	6	13.6	0	0.0	1.000
Partially dependent	14	31.8	2	33.3	
independent	24	54.5	4	66.7	
<b>Walking</b>					
Completely dependent	6	13.6	2	33.3	0.281
Partially dependent	9	20.5	0	0.0	
independent	29	65.9	4	66.7	
<b>Toileting</b>					
Completely dependent	8	18.2	4	66.7	0.037*
Partially dependent	15	34.1	0	0.0	
independent	21	47.7	2	33.3	
<b>Opening doors</b>					
Completely dependent	16	36.4	4	66.7	0.270
Partially dependent	6	13.6	1	16.7	
independent	22	50.0	1	16.7	
<b>Hand function</b>					
Completely dependent	15	34.1	5	83.3	0.087
Partially dependent	6	13.6	0	0.0	
independent	23	52.3	1	16.7	

MCp: *p* value for Monte Carlo test\*: Statistically significant at  $p \leq 0.05$

**Table (6): Relationship between degree of burn injury and the dependency level in performing activities of daily living**

	Degree of burn injury				MCp
	Second (n=30)		Third (n=20)		
	No.	%	No.	%	
<b>Feeding</b>					
Completely dependent	3	10.0	16	80.0	<0.001*
Partially dependent	4	13.3	4	20.0	
Independent	23	76.7	0	0.0	
<b>Dressing</b>					
Completely dependent	7	23.3	18	90.0	<0.001*
Partially dependent	6	20.0	2	10.0	
Independent	17	56.7	0	0.0	
<b>Grooming</b>					
Completely dependent	13	43.3	16	80.0	0.001*
Partially dependent	4	13.3	4	20.0	
Independent	13	43.3	0	0.0	
<b>Bathing</b>					
Completely dependent	4	13.3	17	85.0	<0.001*
Partially dependent	16	53.3	3	15.0	
Independent	10	33.3	0	0.0	
<b>Sitting activities</b>					
Completely dependent	0	0.0	6	30.0	0.003*
Partially dependent	8	26.7	6	30.0	
independent	22	73.3	8	40.0	
<b>Transferring</b>					
Completely dependent	0	0.0	6	30.0	0.004*
Partially dependent	10	33.3	6	30.0	
Independent	20	66.7	8	40.0	
<b>Standing</b>					
Completely dependent	0	0.0	6	30.0	0.004*
Partially dependent	10	33.3	6	30.0	
Independent	20	66.7	8	40.0	
<b>Walking</b>					
Completely dependent	0	0.0	8	40.0	<0.001*
Partially dependent	9	30.0	0	0.0	
Independent	21	70.0	12	60.0	
<b>Toileting</b>					
Completely dependent	2	6.7	10	50.0	<0.001*
Partially dependent	7	23.3	8	40.0	
independent	21	70.0	2	10.0	
<b>Opening doors</b>					
Completely dependent	4	13.3	16	80.0	<0.001*
Partially dependent	3	10.0	4	20.0	
Independent	23	76.7	0	0.0	
<b>Hand function</b>					
Completely dependent	4	13.3	16	80.0	<0.001*
Partially dependent	2	6.7	4	20.0	
Independent	24	80.0	0	0.0	

MCp: *p* value for Monte Carlo test; \*: Statistically significant at  $p \leq 0.05$

**Table (7): Relationship between local complication of injury and the dependency level in performing activities of daily living**

	Local complication						MCp
	Nothing		Hypertrophic		Contractures		
	No.	%	No.	%	No.	%	
<b>Feeding</b>							
Completely dependent	9	27.3	0	0.0	10	76.9	<0.001*
Partially dependent	3	9.1	2	50.0	3	23.1	
independent	21	63.6	2	50.0	0	0.0	
<b>Dressing</b>							
Completely dependent	13	39.4	2	50.0	10	76.9	0.010
Partially dependent	5	15.2	0	0.0	3	23.1	
independent	15	45.5	2	50.0	0	0.0	
<b>Grooming</b>							
Completely dependent	17	51.5	2	50.0	10	76.9	0.063
Partially dependent	5	15.2	0	0.0	3	23.1	
independent	11	33.3	2	50.0	0	0.0	
<b>Bathing</b>							
Completely dependent	11	33.3	0	0.0	10	76.9	0.009*
Partially dependent	14	42.4	2	50.0	3	23.1	
independent	8	24.2	2	50.0	0	0.0	
<b>Sitting activities</b>							
Completely dependent	4	12.1	0	0.0	2	15.4	0.072
Partially dependent	7	21.2	0	0.0	7	53.8	
independent	22	66.7	4	100.0	4	30.8	
<b>Transferring</b>							
Completely dependent	4	12.1	0	0.0	2	15.4	0.137
Partially dependent	9	27.3	0	0.0	7	53.8	
independent	20	60.6	4	100.0	4	30.8	
<b>Standing</b>							
Completely dependent	4	12.1	0	0.0	2	15.4	0.137
Partially dependent	9	27.3	0	0.0	7	53.8	
independent	20	60.6	4	100.0	4	30.8	
<b>Walking</b>							
Completely dependent	4	12.1	0	0.0	4	30.8	0.336
Partially dependent	8	24.2	0	0.0	1	7.7	
independent	21	63.6	4	100.0	8	61.5	
<b>Toileting</b>							
Completely dependent	4	12.1	0	0.0	8	61.5	0.001*
Partially dependent	12	36.4	0	0.0	3	23.1	
independent	17	51.5	4	100.0	2	15.4	
<b>Opening doors</b>							
Completely dependent	10	30.3	0	0.0	10	76.9	<0.001*
Partially dependent	4	12.1	0	0.0	3	23.1	
independent	19	57.6	4	10.0	3	23.1	
<b>Hand function</b>							
Completely dependent	10	30.0	0	0.0	10	76.9	<0.001*
Partially dependent	3	9.1	0	0.0	3	23.1	
independent	20	60.6	4	100.0	0	0.0	

MCp: *p* value for Monte Carlo test;\*: Statistically significant at  $p \leq 0.05$

**Table (8): Relationship between needs for psychological rehabilitation of burn injury and dependency level in performing activities of daily living**

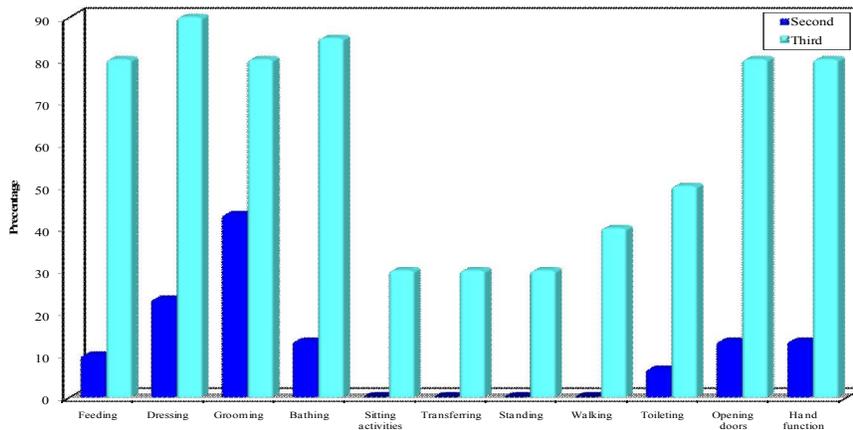
	Needs for psychological rehabilitation				MCp
	Yes		No		
	No.	%	No.	%	
<b>Feeding</b>					
Completely dependent	15	62.5	4	15.4	<0.001*
Partially dependent	6	25.0	2	7.7	
independent	3	12.5	20	76.9	
<b>Dressing</b>					
Completely dependent	17	70.8	8	30.8	<0.001*
Partially dependent	6	25.0	2	7.7	
independent	1	4.2	16	61.5	
<b>Grooming</b>					
Completely dependent	19	79.2	10	38.5	<0.001*
Partially dependent	4	16.7	4	15.4	
independent	1	4.2	12	46.2	
<b>Bathing</b>					
Completely dependent	17	70.8	4	15.4	<0.001*
Partially dependent	6	25.0	13	50.0	
independent	1	4.2	9	34.6	
<b>Sitting activities</b>					
Completely dependent	5	20.8	1	3.8	0.082
Partially dependent	8	33.3	6	23.1	
independent	11	45.8	19	73.1	
<b>Transferring</b>					
Completely dependent	5	20.8	1	3.8	0.161
Partially dependent	8	33.3	8	30.8	
independent	11	45.8	17	65.4	
<b>Standing</b>					
Completely dependent	5	20.8	1	3.8	0.161
Partially dependent	8	33.3	8	30.8	
independent	11	45.8	17	65.4	
<b>Walking</b>					
Completely dependent	7	29.2	1	3.8	0.058
Partially dependent	4	16.7	5	19.2	
independent	13	54.2	20	76.9	
<b>Toileting</b>					
Completely dependent	9	37.5	3	11.5	0.001*
Partially dependent	10	41.7	5	19.2	
independent	5	20.8	18	69.2	
<b>Opening doors</b>					
Completely dependent	15	62.5	5	19.2	0.001*
Partially dependent	4	16.7	3	11.5	
independent	5	20.8	18	69.2	
<b>Hand function</b>					
Completely dependent	15	62.5	5	19.2	0.001*
Partially dependent	4	16.7	2	7.7	
independent	5	20.8	19	73.1	

MCp: *p* value for Monte Carlo test \*: Statistically significant at  $p \leq 0.05$

**Table (9): Relationship between dependency and site of burn**

	Right hand (n = 36)			Left hand (n=36)			Right leg (n=8)			Left leg (n=5)			
	Completely	Partially	independent	Completely	Partially	independent	Completely	Partially	independent	Completely	Partially	independent	
Feeding	No.	16	6	14	16	7	13	1	2	5	1	1	3
	%	44.4	16.7	38.9	44.4	19.4	36.1	12.5	25.0	62.5	20.0	20.0	60.0
Test of sig.	$p = 0.257$			$p = 0.078$			$p = 0.252$			$p = 0.691$			
Dressing	No.	22	6	8	22	7	7	3	0	5	1	1	3
	%	61.1	16.7	22.2	61.1	19.4	19.4	37.5	0.0	62.5	20.0	20.0	60.0
MCp	0.012*			0.003*			0.154			0.285			
Grooming	No.	26	6	4	26	7	3	3	0	5	1	1	3
	%	72.2	16.7	11.1	72.2	19.4	8.3	37.5	0.0	62.5	20.0	20.0	60.0
MCp	0.001*			0.001*			0.049*			0.103			
Bathing	No.	19	13	4	19	14	3	1	4	3	1	2	2
	%	52.8	36.1	11.1	52.8	38.9	8.3	12.5	50.0	37.5	20.0	40.0	40.0
Test of sig.	$p = 0.013^*$			$p = 0.002^*$			$p = 0.121$			$p = 0.332$			
Sitting activities	No.	4	10	22	4	12	20	1	1	6	1	1	3
	%	11.1	27.8	61.1	11.1	33.3	55.6	12.5	12.5	75.0	20.0	20.0	60.0
MCp	1.000			0.480			0.547			0.640			
Transferring	No.	4	12	20	4	14	18	1	1	6	1	1	3
	%	11.1	33.3	55.6	11.1	38.9	50.0	12.5	12.5	75.0	20.0	20.0	60.0
MCp	1.000			0.203			0.416			0.656			
Standing	No.	4	12	20	4	14	18	1	1	6	1	1	3
	%	11.1	33.3	55.6	11.1	38.9	50.0	12.5	12.5	75.0	20.0	20.0	60.0
MCp	1.000			0.203			0.416			0.656			
Walking	No.	6	4	26	6	6	24	1	2	5	1	2	2
	%	16.7	11.1	72.2	16.7	16.7	66.7	12.5	25.0	62.5	20.0	40.0	40.0
MCp	0.163			0.904			0.850			0.207			
Toileting	No.	10	12	14	10	14	12	1	0	7	1	1	3
	%	27.8	33.3	38.9	27.8	38.9	33.3	12.5	0.0	87.5	20.0	20.0	60.0
Test of sig.	$p = 0.337$			$p = 0.015^*$			$p = 0.023^*$			$p = 1.000$			
Opening doors	No.	18	4	14	18	5	13	1	0	7	1	1	3
	%	50.0	11.1	38.9	50.0	13.9	36.1	12.5	0.0	87.5	20.0	20.0	60.0
Test of sig.	$p = 0.049^*$			$p = 0.051^*$			$p = 0.040^*$			$p = 0.546$			
Hand function	No.	17	4	15	17	5	14	1	0	7	1	1	3
	%	47.2	11.1	41.7	47.2	13.9	38.9	12.5	0.0	87.5	20.0	20.0	60.0
MCp	0.251			0.130			0.078			0.521			

MCp:  $p$  value for Monte Carlo test;  $\chi^2$ : Chi square test  
 \*: Statistically significant at  $p \leq 0.05$



**Figure (2): Relationship between degree of burn injury and the dependency level in performing activities of daily living**

#### 4. Discussion

Burn injuries contribute significantly to morbidity and mortality in the developing countries. In the African region, burns are a significant cause of death and disproportionately affect those <15 years of age.<sup>(8,9)</sup> Burn care is a significant financial burden on both the hospital and the patient's families.<sup>(10)</sup>

The injury represents an assault on all aspects of the patient, from the physical to the psychological. Burns are among the most intensely painful injuries, all patients will experience pain, regardless of the cause, size or depth of the burn.<sup>(11,12)</sup>

Despite advances in topical wound care and pharmacology, and a growing emphasis on palliative care, wound care is the main source of pain and sensory problems associated with burn injury.<sup>(13,14)</sup> Additionally, burn injuries have been associated with anxiety, social isolation, depression, disruption in activities of daily living, sleeping disturbances and all of the consequent difficulties in returning to life after physical rehabilitation.<sup>(15)</sup>

The present study is conducted in order to determine the relationship between dependency level and different burn parameters.

The present study revealed that the majority of the patients were in the age group 21-30 years. High incidence were among young adults may be explained by the fact they are generally active and exposed to hazardous situation in both work and the home. These findings are in line with Edlich *et al.* (2006)<sup>(16)</sup>, who stated that the highest incidence of burn injury occurs in the age 20-29 years. These results were contradicting with Al-Gamaly and Huejner<sup>(17,18)</sup> who stated that the commonest age group affected by burn was between 30-40 years old.

As regards to the sex, the present study showed that around two thirds of patients were male (70%). This results was in line with the results Abdel-Hamid,<sup>(19)</sup> and Ragab (2002)<sup>(20)</sup> who found that the majority of patients were male.

This might be explained as the women are responsible for preparing, cooking foods which may expose them to many sources of burn.

In relation to marital status, the finding revealed that the majority of the patients were married, and have low socioeconomic status. This may indicate that marriage increases responsibility workload; problems with low socioeconomic status which may lead to loss of concentration, easily fatigability that may raise the risk for burns. This is in contrast with Bayumi<sup>(21)</sup> mentioned that 82% of single adults most commonly affected by burn injury.

Regarding to the educational level, the finding showed that the majority of the patients were illiterate or just read and write or have primary school. The lack of education and safety precaution knowledge

make the people at higher risk to be exposed to burn injuries.

Regarding occupation, the result of this study revealed that the majority of subjects were house wives, perform manual work. This finding was in agreement with Abd-elrahman<sup>(22)</sup> who indicated that the home-related accidents account for more than 60% of all burn injuries. Also these results were supported by Abd-elrahman and Abbass who found that the majority of subjects were house wives or unemployed.<sup>(22,23)</sup>

As regards to residence area, this result revealed that the majority of subjects were from urban area. This findings was in line with Morales<sup>(24)</sup> and Hemeda<sup>(25)</sup> who found that most of the patients were from urban areas.

Regarding the place of occurrence, the current study revealed that the majority of burn injuries occur at home. This is to some extent similar to results reported by the American Burn Association (2010)<sup>(26)</sup> who found that the majority of burn injuries occur at home.

In addition, the study done by Abdel hamid (2009)<sup>(19)</sup> and Abd-elrahman (2008)<sup>(22)</sup> found that the majority of the patients were affected by flame burn and most burn accidents occur at home.

This can be justified as the majority of patients were burned by gas explosion and gasoline flame. This may be due to unsupervised and careless handling of gas pipes.

These findings were congruent with the study done by Hemeda *et al.* (2003)<sup>(25)</sup> who found that the common cause of burn is electrical injury.

Regarding the circumstances of injury, the majority of the patients were accidentally burned and only a small percentage was suicidally burned. Similar finding were reported by Jaiswal *et al.* (2007)<sup>(27)</sup>, who found that the majority of patients were accidentally burned while the rest of them were suicidally burned.

In relation to the site of injury, the present study revealed that the most common areas involved in burn are right and left hands, followed by upper and lower arms, anterior trunk and right and left thigh. This can be justified as the majority of the patients were burned by gas explosion and flame. These findings were supported Gangemi *et al.* (2008)<sup>(15)</sup> who found that the upper limbs, lower limbs were the primary body parts most often affected by burn, and high percentage of patients presented with burn scars to the hands.

Regarding the degree, depth and classification of burn injury, more than 50% of the studied subjects were superficial partial thickness second degree burn and 36% were classified as major burn injury.

In addition, the finding of the current study revealed that 26% of the studied subjects developed contractures and 25% developed deformity in hands. These findings were supported by Gangemi *et al.* (2008)<sup>(15)</sup> who found that contractures, followed by hypertrophic scar and amputation are the common complications after burn.

As regards relationship between the degree of burn and the activities of daily living, these findings were in agreement with Berrin *et al.* (2006)<sup>(29)</sup> who found that the degree of burn, total body surface area affected and the site of burn is correlated with psychological problems and dependency in performing daily living activities.

In addition, Tedsone & Tarrier (1997)<sup>(30)</sup> reported that there is an evidence that patients with major burn have higher dysfunction and increase the level of dependence in performing activities of daily living.

Regarding the relationship between local complications associated with burn injury and performance of activities of daily living, the current study reported that local complication associated with burn injury have a statistical significant difference with most activities of daily living as feeding bathing, toileting, opening doors and hand function.

This can be rationalized by the fact that those patients who have complications have major limitations in movement and daily living activities. These findings are supported by Berrin *et al.* (2006)<sup>(29)</sup> who reported that joint contracture affect burn patients ability to perform physical functioning.

Moreover, scar hyper trophy and contracture limit the joint motion and the body function of the patient.

Regarding the relationship between needs psychological rehabilitation of burn injury and activities of daily living. The results revealed a statistical significance difference between the needs of psychological rehabilitation after burn injury and performance of daily living activities.

Tedstone& Tarrier (1997)<sup>(30)</sup> reported that the psychological needs of burn patients are not provided with the overall prevalence. Furthermore, Salvador *et al.* (2000)<sup>(31)</sup> found that burn represent a major problem that affect the overall psychological health and physical activities. Therefore, the nurse has on important role in assessment, diagnosis patients experiencing or at risk for psychological problems and produce a psychological care or require psychotherapist for them.

### Conclusions

The results of the present study concluded that most of activities of daily living were performed independently by less than 50% of the studied

subjects. Also, these results showed that there were a highly significant difference between the most of activities of daily living and different burn parameters.

### Recommendations

1. Physiotherapy and rehabilitation programs should start as early as possible to increase the independency level in performing the activities of daily living.
2. Collaborate with physical and occupational therapists to plan for exercise required gradually which increase energy levels.
3. Nurses should assist the patient to set achievable. Short term goals for increased independency level in performing activities of daily living.
4. Plan daily activities to maximize energy required for specific treatment and tasks in which patient must actively participate.
5. Develop standards of nursing interventions for burned patients during the phases of burn injury (emergent, acute and rehabilitation phases).
6. Nurses should use creative approaches to encourage patient to follow the exercise schedule and move joints in activities.
7. Burn educational programs should be developed and provided to the patients through videos, modules and pictures that can faster patient's motivation and adaptation.

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