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## **Quality of life in a sample of Egyptian Patients with postburn scars: A clinical and Dermatology Life Quality Index (DLQI) based cross-sectional study**

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**Abstract**---Dermatology Life Quality Index (DLQI) is the most specific score that is used widely for patients with different skin diseases to show the impact of their skin condition on their quality of life to confirm the importance of early treatment to avoid more psychological complications to such patients. The aim of the study was to discover if the quality of life of these patients differs according to their clinical and demographic data. A total of 470 patients with post burn scars completed the full questionnaire that was prepared in Arabic language and written by easy clear words. The data was collected to calculate the score of each patient, then statistically analyzed to find the relation between the DLQI scores and the sociodemographic data of post burn scars patients. Our results found; the study revealed a mean DLQI score of 11.16 that indicate strong effect of burn scars on the quality of life. There was positive correlation between DLQI score and duration of scars with p value of 0.016 but there was no correlation between DLQI score and ages of patient with p value of 0.116. There were strong significant relations between DLQI score and surface area of scars, site of scars (p values were 0.000 and 0.006 respectively). Other patients' factors proved to have strong effect on DLQI score as address and occupational state while other factors proved to have no relation with DLQI scores as gender and marital state. Our conclusion, the study showed a significant psychological impairment proved by high mean DLQI scores among patients with postburn scars and a significant relation between the DLQI score and many patients variables that could be taken into consideration later on in evaluating a patient with post-burn scar.

**Keywords**---Post burn scars, Dermatology Life Quality Index, Quality of life.

## Introduction

The skin is considered the largest organ of the body that has many vital functions, the skin can be affected by burns and the number of cases of burns in Egypt is constantly increasing [World Health Organization, 2014]. Post burn scars may take different forms, but hypertrophic scars are the commonest [Bombam et al. 2003].

Postburn scars; whatever the type of the scar formed, is considered as disfigurement especially when associated with contracture or function affection so postburn scars usually affect the patient's psychology and subsequently his quality of life [Finnerty et al. 2016].

It is logical that the first medical concern immediately after burn is how to save the patient's life and the priority is given to people who have life threatening injuries. But the issue is different when dealing with patients suffering from scars of burns, here the priority of treatment should be given to people whose social lives have been affected or may be affected more because of these scars [Hoogewert et al. 2014].

Management of postburn scars requires long term follow up and many treatment options are included as intralesional injections, peelings, fractional laser resurfacing and surgery. More than one treatment modality can be used for the same patients to improve the outcome, and this is determined by the medical team according to the type of the scars and the compliance of the patients [Wael et al. 2019].

Recently, there are many studies that pay attention to the quality of life of patients exposed to burn injury and search for how they can adapt psychologically with the resulted scars [Stavrou et al. 2014]. Dermatology Life Quality Index score (DLQI score) is a widely used simple questionnaire that is formed of ten questions written in a simple clear language. On answering these questions that takes few minutes, we can detect the effect of the skin disorder on the psychology of the patient [Van Geel et al., 2016].

The DLQI score for each patient is calculated by the summation of the scores of the ten questions (the score of each question ranges from zero to three) so the resulted DLQI score is minimally zero and maximally thirty. The higher the score, the more the patient's psychological affection. Another evaluation considered that any DLQI score above 10 indicate sever psychological impairment [Finlay et al., 2018].

In this study, we tried to find relations between the DLQI scores and the demographic and clinical data of the patients of post burn scars to be able to establish a list of vulnerable groups of patients who are at high risk to develop impaired life quality, so they are in dire need of rapid therapeutic intervention.

The importance of identifying those high risk groups is the ability to make an ideal waiting list (if needed) for patients seeking for treatment with the priority to patients suffering from more psychological harms and also this may be the cornerstone for designing a digital application that arrange the patients that wait for their treatment in charity hospitals according to a scientific base that detect the patients that are in need for the faster treatment.

### **Patients and Method**

The study was a cross sectional study including 470 patients with post burn scars admitting to the dermatology outpatient clinic of the national research centre. The sample size was calculated using openepi version. The sample was estimated according to suggested prevalence of 50% with 5% accepted margin of error so sample is 384 then after adjustment for non-response sample is not less than 461.

We excluded from the study patients less than 3 years old or patients with any mental or psychological upsets to avoid any external effects upon their answers, also patients with recent burns to make sure that the measured psychological impacts were from the scars not from the burn accident.

### **Methods**

DLQI is an international questionnaire. It was translated in Arabic language and written by easily read clear words. The sheet of the questionnaire consisted of two groups of questions, group one included questions about the demographic data of the patients like age and address while group two of questions are the standard ten questions previously put by the WHO to evaluate the quality of life of the patients [Basra et al., 2008]. Patients included in the study were asked to answer the questionnaire without any external influences. The data was collected to calculate the DLQI score of each patient with a minimal score of zero and a maximal score of 30.

### **Statistical analysis:**

Data collected from the patients 'sheets were coded to be statistically analyzed using SPSS (statistical program for social science version 23). Quantitative data was described as mean, SD, range by using Shapiro test of normality, while qualitative data was described as number and percentages. Relations in between qualitative data was done using the Chi-square test. Mann Whitney test was used to compare between quantitative variables. P value was considered statistically significant if less than 0.05.

### **Results**

The demographic characteristics of the 470 patients who fully completed answering the questionnaire were shown in Table 1. One hundred and twenty-six (26.8%) were males and three hundreds and forty-four (73.2%) were females. Most patients who completed the questionnaire were single 339 (72.1%) and only 127 (27.0%) were married. Two hundreds and ninety patients (61.7%) were normally

working while 180 (38.3%) had no work. 249 patients (53%) were living in urban areas while 221 patients (47%) were coming from rural areas. The majority of patients included in the study 360 (76.6%) were suffering from scars of exposed body areas while only 110 (23.4%) patients had scars over non-exposed body areas. Patients answered the sheet were between the age of 3 to the age of 52 and the duration of their scars were between 2 to 40 years.

Table (1): Demographic data of the patients

	Frequency (number)		%	
Gender				
Males	126		26.8	
Females	344		73.2	
Marital state				
Single	339		72.1	
married	127		27.00	
Occupation				
Not working	180		38.3	
working	290		61.7	
Address				
Urban	249		53.0	
rural	221		47.0	
Affected area				
Non-exposed	110		23.4	
Exposed	360		76.6	
	Mean	SD	minimum	maximum
Age	21.08	11.126	3	52
Duration of scars	10.50	7.913	2	40
DLQI score	11.16	6.242	0	30

*The mean total DLQI scores in patients of postburn scars included in the study was 11.16 which scientifically proves that the post-burn scars can lead to sever psychological impairment for the patients.*

#### **Relation between the DLQI score and gender**

Statistical analysis of the data obtained from the questionnaire revealed that there was no significant relation between the gender and the DLQI score with a p value=0.956 and there was no difference between males and females as regard the psychological impact of burn scars.

#### **Relation between the DLQI score and marital state**

It was found that the DLQI score was higher among single patients than in married but without statistically significant difference with p value = 0.568

#### **Relation between the DLQI score and occupation**

There was a highly statistically significant relation between DLQI score and the occupational state of patients that reflect a strong psychological impact of burn scars among non-working patients with p value = 0.000 as illustrated in table 2

Table (2): relation between DLQI score and patients' occupation

	Non-working (n= 180)	working (n= 290)	P value
DLQI score (Mean and SD)	12.56 ± 5.837	10.30 ± 6.626	0.000

### Relation between the DLQI score and patients address

We found in our study that there was a statistically significant relation between DLQI score and the location address of patients with a strong psychological impact of burn scars among patients living in rural areas with p value = 0.014 as illustrated in table 3

Table (3): relation between DLQI score and patients' address

	urban (n= 249)	rural (n= 221)	P value
DLQI score (Mean and SD)	10.47 ± 6.342	11.94 ± 6.441	0.014

### Relation between the DLQI score and cause of burn

Surprisingly, we found a statistically significant relation between DLQI score and the cause of burn with a stronger psychological impact among patients exposed to flash fire than those who exposed to scald burn with p value = 0.002 as illustrated in table 4

Table (4): Relation between DLQI score and cause of burn

	Flash burn (n= 196)	Scald burn (n= 274)	P value
DLQI score (Mean and SD)	12.26 ± 7.183	10.38 ± 5.706	0.002

### Relation between the DLQI score and the surface area of burn scars

We classified burn scars according to their surface area into scars < 50% body surface area (BSA) and scars > 50% of BSA and we found a strong statistically significant relation DLQI score and the scar surface area. A higher DLQI score was for the scars affected more than 50% of the body surface area with p value = 0.000 as illustrated in table 5

Table (5): Relation between DLQI score and the surface area of burn scars

	Surface area< 50% of BSA (n=287)	Surface area> 50% of BSA (n=183)	P value
DLQI score (Mean and SD)	9.25 ± 5.468	14.16 ± 6.676	0.000

### Relation between the DLQI score and the site of burn scars

A strong statistically significant relation was found between DLQI score and the site of the scars that were classified into exposed sites and non-exposed sites. DLQI score was higher among patients complaining from scars at exposed sites with p value = 0.006 as shown in table 7

Table (7): Relation between DLQI score and site of burn scars

	Non exposed sites (n=110)	Exposed sites (n=360)	P value
DLQI score (Mean and SD)	9.69 ± 4.882	11.61 ± 6.768	0.006

### Correlation between the DLQI score and the patient's age

Our study revealed very weak positive correlation between the age of patient and DLQI score but this correlation was insignificant with p value = 0.116 as shown in figure 1

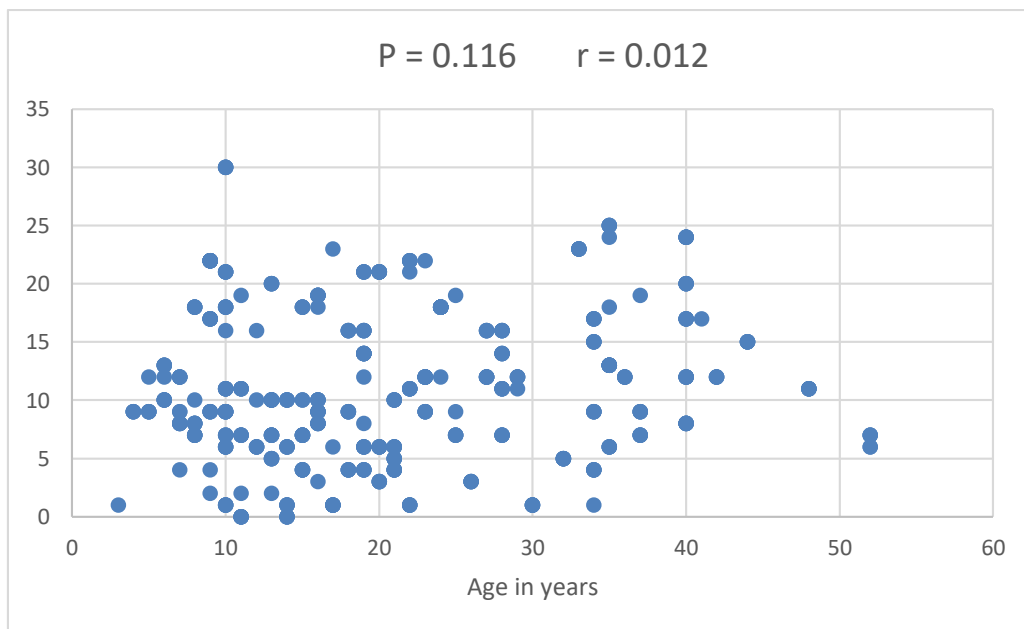


Figure (1): Correlation between DLQI score and age

### Correlation between the DLQI score and the duration of the scars

A statistically significant positive correlation was found between DLQI score and the duration of the scars that illustrated that patients with older scars suffered from more psychological stress with p value = 0.016 as shown in figure 2

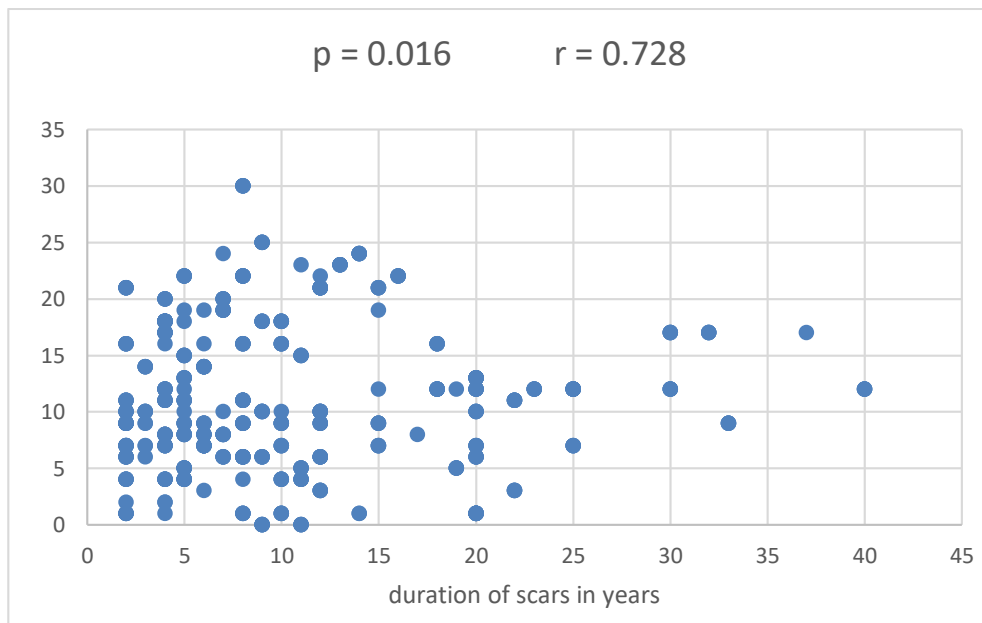


Figure (2): Correlation between DLQI score and duration of scar

## Discussion

Dermatology life quality index (DLQI) score is a reliable world-wide score used to estimate the psychological impact of any skin disorders on the patients and measure the extent of effect of such skin disorder on their quality of life [He et al., 2013]. The score was estimated using a questionnaire put by the WHO. The validity and reliability of this questionnaire were tested before by many studies on patients with psoriasis, acne scars, keloids and burns [He et al., 2013; Reinholz et al., 2015; Nazila et al., 2007].

In our research we used the questionnaire to assess the DLQI scores of 470 patients admitted to the clinic complaining from postburn scars and from the data obtained we aimed to find any relations between some demographic and clinical data of the patients and their scores. These relations may help later on to fairly select the patients most deserving of rapid therapeutic interventions as they could be considered as vulnerable group for major psychological problem with major effects on their quality of life.

The mean DLQI score in our study; 11.16 was very high when compared with other previous studies in which the mean DLQI scores were ranged from 1.7 to 8.95 [Walker & Lewis-jones, 2006; Tasoula et al., 2012; Durai et al., 2015]. This proved the strong effect of post-burn scars on the quality of life.

During our attempt to find relations between DLQI score and the demographic and clinical data of the patients, we confirmed some relations that were proved by previous studies as the significant positive correlation between the DLQI score and the duration of the scar [Samanthula & Kodali, 2013].

Also, the study proved a significant positive relation between the surface area of the scars and DLQI scores and that was expected as many previous studies had reported this relation between the surface area of the skin disorder and the DLQI score as in [Tomotaka et al., \[2012\]](#) who confirmed the correlation between DLQI and the surface area of psoriasis.

There were some results in our study that contradict the results of previous studies as the relation between the patient gender and DLQI score that was confirmed by [Tomotaka et al, \[2012\]](#) who proved that DLQI score was higher among female psoriatic patients when compared with males, however we couldn't find a relation between DLQI score and gender in our study.

Again, we couldn't find a significant correlation between the DLQI scores and age of patients, but this might be due to a wide range of ages included in the study which could be a study limitation. As many previous studies confirmed the presence of a significant relation between age and DLQI score as in [Komenan et al., \[2020\]](#), who proved that younger ages presented with higher DLQI scores.

From the data collected, it was found that the site of the scar was considered a very important factor in affecting the quality of life as most patients coming to the clinic seeking for treatment were patients with scars on exposed areas (n= 360) and their mean DLQI score was significantly larger (p value 0.000) than that of patients with scars in non-exposed areas (n=110).

In our study, we reported some relations that weren't discussed in previous studies as the relation between DLQI score and the cause of burn, we found that scars resulted from flash fires affected the DLQI score more than those from scald burns. We attributed that to the possible severe psychological trauma that usually accompanying the burn with flash fires.

Also, we showed a significant relation between DLQI score and occupational state where DLQI score was high among non-working patients, this finding might be a cause or a result meaning that scars might affect the patient social relation leading him to avoid public workplaces or on another hand, the repeated exclusion from public works due to his appearance may affect his psychological health.

In our research we didn't study the relation between DLQI score and severity of the scars and we recommended this relation to be studied on the upcoming surveys, also we recommended to recruit larger number of patients later on to ensure nearly similar number of patients within the internal groups of each variable to reach to the most reliable results. More studies were recommended comparing DLQI score between patients with different skin disorders to identify the skin disorder with the strongest impact on the quality of life of patients.

## **Conclusion**

The study showed a significant psychological impairment proved by high mean DLQI scores among patients with postburn scars and a significant relation

between the DLQI score and many patients variables that could be taken into consideration later on in evaluating a patient with post-burn scar.

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