Effect of a Rehabilitation Program on the Knowledge, Physical and Psychosocial Functions of Patients with Burns

Mohamed Radwan[1], Salwa Samir[2], Ola Abdel Aty*[2] and Salwa Attia[3]

Faculty of Medicine, Mansoura University[1], Medical Surgical Dept., Faculty of Nursing, Ain Sham University[2], Mansoura University Hospital[3]
*ola.ahmed22@gmail.com

Abstract: Burns injuries may be severe enough to restrict daily activities in the home, school, and workplace. The nurse has a crucial role in implementing strategies for relevant effective care of patients with burn. The aim of the study was to evaluate the effect of a rehabilitation program on the knowledge, physical and psychosocial functions of patients with burn. This quasi-experimental study was conducted at the burn units of the Main University and Emergency Hospital in El-Mansoura on a convenience sample of 100 burn patients who were divided randomly into two equal groups: a study group for application of the intervention, and a control group to receive the routine management of the hospital. Data were collected using an interview questionnaire form and the Brief Burn Specific Health Scale (BSHS-B). A rehabilitation program with a booklet was developed after reviewing related literature to cover burn definitions, causes, types of burn, complications, proper diet, exercise, wound care, stress management. A booklet containing all the program materials was prepared in Arabic language. The program was provided to the study group patients, while the control group received the routine hospital's nursing management. The program effectiveness was evaluated through a posttest done for both groups. The study was implemented during the period from November 2006 to November 2007. Patients in the two groups had similar demographic as well as burn injuries characteristics. After implementation of a rehabilitation program, the knowledge scores were statistically significantly higher among study group patients in all areas as burns definition ($p<0.001$), treatment ($p=0.022$), exercise ($p<0.001$), and diet ($p< 0.001$). They also had significantly better scores of the Brief Burn Specific Health Scale (BSHS-B). The scores of knowledge and BSHS-B improved in both groups; however, the magnitude of the change was much lower in the control group compared to those in the study group. The study concludes that inclusion of the information needed by patients with burn in a rehabilitation program improves their knowledge, with consequent positive impact on their physical and psychosocial status. Therefore, the study recommends implementation of this rehabilitation program for all patients with burn injury. Nurses should be trained in patient education in order to be able to successfully implement such program.

[Mohamed Radwan, Salwa Samir, Ola Abdel Aty and Salwa Attia Effect of a Rehabilitation Program on the Knowledge, Physical and Psychosocial Functions of Patients with Burns . Journal of American Science 2011;7(8):427-434]. (ISSN: 1545-1003). http://www.americanscience.org.

Key words: Burn, rehabilitation program, nursing

1. Introduction:

Burns are considered one of the most serious and devastating injuries among people of all ages. These injuries may be severe enough to restrict daily activities in the home, school, and workplace ***(Linton & Maebius, 2007; Park et al., 2008)***. Burn severity depends on its depth and the body surface affected. Burn care classified according to the depth of tissue destruction as superficial, partial thickness and full thickness injuries ***(Edelman, 2007)***.

Burn injury is associated with anatomical, physiological, as well as immunological alterations ***(Hosseii et al., 2007)***, which may end in infection ***(Church et al., 2006)***, and acute renal failure accompanied by a high death rate ***(Jaiswal et al., 2007)***. In addition to their dramatic physical effects, burn injuries frequently cause deleterious psychological complications ***(Mustonen and Vuola, 2008).*** These complications require comprehensive interdisciplinary rehabilitation focused on preventing long-term problems with scarring, contractures, and other problems that limit physical function, community integration, and return to work and other activities. Such program should begin during the acute treatment phase, and must be designed to meet each patient's specific needs ***(Heimbach et al., 2003).***

Nurses have an important role in the comprehensive interdisciplinary rehabilitation programs for burn survivors ***(Moi et al., 2008)***. Nursing interventions represent those activities that nurses do to assist the individual or family to move toward a desired outcome ***(Low, 2003).*** These interventions include the use of medications and non-pharmacological methods to achieve pain relief ***(Summer et al., 2007)***. They also include alleviation of the psychosocial and spiritual stressors through providing information and guidance, and improving the communication between nurse, physician and

patient ***(Kazak, 2005)***. Hence, the nurse is an important member of the rehabilitation team ***(Edgar and Bereton, 2004).***

Significance of the study

The researchers realized the importance of the problem of burn injuries through obtaining the statistics from the burn unit at Mansoura University Hospital in the year 2008. The number of cases who were burned accounted for 550 cases, i.e. almost two cases per day according to the Hospital Records in Mansoura University Hospital**.** Most of these patients had serious consequences that altered their biopsychosocial functioning. Given the crucial role of nurses in implementing strategies for relevant effective care of patients with burn, this study is intended to assess the utility of providing burn patients with information through a rehabilitation program in improving their knowledge as well as their physical and psychosocial functions.

Aim of the study

The aim of the study was to evaluate the effect of a rehabilitation program on the knowledge, physical and psychosocial functions of patients with burn. It was hypothesized that the implementation of this rehabilitation program will lead to significant improvements in knowledge, physical and psychosocial functions of patients with burn.

2. Subjects and Methods

The study was conducted at the burn units of the Main University and Emergency Hospital in El-Mansoura. A quasi-experimental design was used with a study and control groups, and pre-post assessment. The study participants consisted of a convenience sample of 100 burn patients. They were recruited according to the inclusion criteria of being adult with age 18-60 years, with partial or full-thickness burn regardless of the site, in the post-emergency stage (72 hours after the burn incident) who were willing to participate. The only exclusion criterion was having a chronic disease. These patients were divided randomly into two equal groups: a study group for application of the intervention, and a control group to receive the routine management of the hospital.

The data were collected using an interview questionnaire form developed by the researchers and the Brief Burn Specific Health Scale (BSHS-B). The interview questionnaire form included a section for patient's personal data as age, sex, and level of education, marital status, etc. The second section was for recording the data related to the burn injury as the causative agent, site, surface area, depth, etc. The third section was for pre-post assessment of patient's knowledge about burn injury nature (10 items), management (4 items), and recommended diet (8 items) and exercise (5 items). It was developed based on pertinent literature ***(Lewis et al., 2004; Perry and Potter, 2004; Slone, 2004)***. The total score was 49.

The Brief Burn Specific Health Scale (BSHS-B) was adopted from ***Kildal et al.(2001)***. It was used to assess the physical and psychosocial status of burn patients. It measures four domains in the area of physical status (simple ability, hand function, heat sensitivity, and treatment regimens), and five domains in the area of psychosocial status (affective, body image, interpersonal relationship, sexuality, and work). The scale consists of 40 items on a 5-point Likert scale ranging from 0 (extremely) to 4 (not/none at all). Thus, the total score ranges between zero and 160. A higher score indicates better physical and psychosocial status. This tool was also used for pre-post program evaluation.

Content validity:

The tools were reviewed by a panel of seven experts from medical-surgical nursing faculty and plastic surgery to ascertain their face and content validity and relevance.

Pilot study

A pilot study will be carried out on 10% of the patents under study to test the applicability, clarity and efficacy of the tools, then the tool will be modified according to the results of pilot study.

Rehabilitation program

This program was intended to cover the areas of knowledge and psycho-social disorders that burn patients may face with the aim of improving their health status. The content of program was developed after reviewing related literature ***(Ignativicius and Workman, 2002; Rochet and Zaoui, 2002; Ahmed,2003; Civaia et al., 2003; Timby and Smith, 2003)***. The program contents covered the areas of burn definitions, causes, types of burn, complications, proper diet, exercise, wound care, stress management. A booklet containing all the program materials was prepared in Arabic language.

Fieldwork

To carry out the study, the necessary approval was obtained from the director of Mansoura Hospital and the head of the burn department. The aim of the study and the procedures were explained to them to obtain their cooperation for data collection.

The study was implemented during the period from November 2006 to November 2007.

Patients were recruited according to the eligibility criteria. The researchers approached each patient individually at the post emergency stage after stability of the condition, explained to him/her the purpose and procedures of the study, and invited him/her to participate. Those who agreed were interviewed using the two data collection tools, and then assigned either to the study or the control groups.

A rehabilitation nursing program was provided to the study group patients, while the control group received the routine hospital's nursing management. The program consisted to seven sessions over two weeks (3 practical and 4 theoretical). Each session lasted 30-45 minutes. The first two sessions were designed to equip subjects with the necessary basic information related to the burn injury; one session was about diet, and three sessions about wound care and physical therapy, and the last session was about coping. The total time for the program was six hours. The training was four days per week in teaching sessions organized during the morning shift after patients receiving their medication and care, or after the visiting hours. Patients were handed the program booklet, with some explanations from the researchers regarding its use.
The researchers collected the data during the morning and afternoon shifts, four days per week. The personal interview took about 30 to 40 minutes. At the end of the program, its effectiveness was evaluated through a posttest done for both groups, using the same data collection tools.

Human rights

The researchers approached patients individually at the burn unit, explaining the purpose of the study, and the importance of rehabilitation in burn injury. Patients who were willing to participate were included in the study after obtaining their written consent, after informing them about their rights to refuse or withdraw at any time. Confidentiality of all information was secured. The study maneuvers could not entail any harmful effects on participants. Professional help was provided to all participants whenever needed.

Statistical analysis

Data entry and statistical analysis were done using SPSS 16.0 statistical software package. Quantitative continuous data were compared using Student t-test in case of comparisons between two groups. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. In larger than 2x2 cross-tables, no test could be applied whenever the expected value in 10% or more of the cells was less than 5. Statistical significance was considered at p-value <0.05.

3. Results

Table 1 shows a similar distribution of various socio-demographic characteristics of patients in the study and control groups. About two thirds of them were less than 35 years age, with slightly more males in both groups (54.0%). More than one-third of the patients in the study (38.0%) and control (36.0%) groups had secondary education. Slightly less than half of the patients in the study group were married (46.0%), compared to 50.0% of the control group. As for job status, only about one third of the study (32.0%) and control (38.0%) group patients were working. None of these differences were statistically significant.

Table 2 provides the characteristics of burn injuries among patients in the two groups. About two-thirds of the burns were open flame, 64.0% and 62.0% in the study and control groups, respectively. Most patients had multiple site burns, with almost all of them having burns of their extremities. As for the extent of the burn, about half of the patients in the study (48.0%) and control (50.0%) groups had less than 21% surface area burn. However, the depth was mostly partial to full thickness in both groups. As the table indicates, no statistically significant differences were revealed between study and control groups.

Comparison of the pre-intervention knowledge scores of patients in the study and control groups revealed statistically significant differences (Table 3). It is evident that patients in the control group had significantly higher knowledge about treatment (p=0.006). After implementation of the intervention, the knowledge scores were statistically significantly higher among study group patients, compared to the control group patients in all areas of knowledge as burns (p<0.001), treatment (p=0.022), exercise (p <0.001), and diet (p < 0.001).

Concerning burn patient's physical and psychosocial status as assessed by the Brief Burn Specific Health Scale (BSHS-B), Table 4 indicates some statistically significant differences between the two groups before the rehabilitation program. These were related to body image (p <0.001), personal relationships (p =0.025), and sexuality (p <0.001). In all these differences, the scores were higher among patients in the study group. After implementation of the rehabilitation program, the table points to statistically significant differences between the two groups in almost all domains. The only exceptions were related to simple abilities (p =1.00), and affect (p =0.40). In all these differences, the scores were higher among patients in the study group.

Figure 1 illustrates the total changes in knowledge and BSHS-B scores among patients in the study and control groups at the pre and post-tests. It shows statistically significant improvements in study group patients scores of knowledge from 18.8 to 29.7 ($p<0.001$), and of BSHS-B from 77.3 to 110.0 ($p<0.001$). On the other hand, in the control group, the knowledge scores rose from 17.1 to 19.6, and the BSHS-B scores from 73.3 to 88.7. Although these improvements were also statistically significant in the control group, the magnitude of the change was much lower compared to those in the study group.

Table 1: Demographic characteristics of patients in the study and control groups

	Study (n=50)		Control (n=50)		X^2 test	p-value
	No.	%	No.	%		
Age (years):						
<25 years	21	42.0	18	36.0		
25-34 years	10	20.0	15	30.0		
35-45 years	10	20.0	12	24.0		
> 45	9	18.0	5	10.0	2.56	0.47
Sex:						
Male	27	54.0	27	54.0		
Female	23	46.0	23	46.0	0.0	1.00
Education:						
Illiterate	7	14.0	9	18.0		
Read & write	11	22.0	9	18.0		
Primary	8	16.0	6	12.0		
Secondary	19	38.0	18	36.0		
University	5	10.0	8	16.0	1.46	0.83
Marital status:						
Married	23	46.0	25	50.0		
Unmarried	27	54.0	25	50.0	0.16	0.69
Job:						
Not working	34	68.0	31	62.0		
Working	16	32.0	19	38.0	0.40	0.53

Table 2: Characteristics of burns among patients in the study and control groups

	Study (n=50)		Control (n=50)		X^2 test	p-value
	No.	%	No.	%		
Cause of burn:						
Flame	32	64.0	31	62.0		
Scald	17	34.0	13	26.0		
Electrical	1	2.0	6	12.0	--	--
Site:[@]						
Face and neck	19	38.0	26	52.0	1.98	0.16
Extremities	49	98.0	50	100.0	Fisher	1.00
Trunk	8	16.0	13	26.0	1.51	0.22
Surface area (%)						
15-	24	48.0	25	50.0		
21-	16	32.0	15	30.0		
26-30	10	20.0	10	20.0	0.05	0.97
Depth:						
Superficial	12	24.0	18	36.0		
Partial/full thickness	38	76.0	32	64.0	1.71	0.19

(@) Not mutually exclusive (--) Test result not valid

Table 3: Pre-post scores of knowledge about burns among patients in the study and control groups

	Knowledge score (mean±SD)		Student t-Test	p-value
	Study (n=50)	Control (n=50)		
Pre test:				
Burn	8.2±2.0	7.6±2.2	1.43	0.157
Treatment	2.2±0.0	2.4±0.5	2.83	0.006*
Exercise	1.0±0.4	1.0±0.4	0.0	1.00
Diet	6.8±1.9	6.2±1.6	1.71	0.091
Post test:				
Burn	12.6 ±3.0	8.1±1.4	9.61	<0.001*
Treatment	3.1±0.6	2.6±1.4	2.32	0.022*
Exercise	4.0±1.7	1.2±1.1	9.78	<0.001*
Diet	10.0±1.2	7.9±1.3	8.39	<0.001*

(*) Statistically significant at p<0.05

Table 4: Pre-post Brief Burn Specific Health Status (BSHS-B) scores among patients in the study and control groups

	BSHS-B score (mean±SD)		Student t-Test	p-value
	Study (n=50)	Control (n=50)		
Pre-test:				
Simple abilities	3.1±1.8	3.1±1.8	0.0	1.00
Hand function	6.6±7.6	6.6±7.6	0.0	1.00
Heat sensitivity	8.1±5.5	8.1±5.5	0.0	1.00
Treatment regimen	7.7±3.0	7.7±3.0	0.0	1.00
Affect	12.3±2.8	12.3±2.8	0.0	1.00
Body image	7.4±1.6	5.4±1.6	6.25	<0.001*
Personal relationships	10.7±2.2	9.7±2.2	2.27	0.025*
Sexuality	11.2±1.8	8.2±1.8	8.33	<0.001*
Work	7.7±3.0	7.0±3.0	1.17	0.246
Total	77.3±16.4	73.3±16.4	1.22	0.226
Post-test:				
Simple abilities	5.8 ±2.0	5.8 ±1.5	0.0	1.00
Hand function	11.8 ±6.5	9.4 ±4.9	2.09	0.04*
Heat sensitivity	11.7 ±4.2	8.5 ±2.8	4.48	<0.001*
Treatment regimen	11.9 ±2.3	9.0 ±2.4	6.17	<0.001*
Affect	14.1 ±2.0	13.7 ±2.7	0.84	0.40
Body image	8.6 ±1.6	5.4 ±1.4	10.64	<0.001*
Personal relationships	14.1 ±1.8	9.8 ±1.9	11.62	<0.001*
Sexuality	10.9 ±1.5	9.6 ±1.1	4.94	<0.001*
Work	10.1 ±3.1	7.6 ±2.1	4.72	<0.001*
Total	110.0±14.2	88.7 ±11.3	8.30	<0.001*

(*) Statistically significant at p<0.05

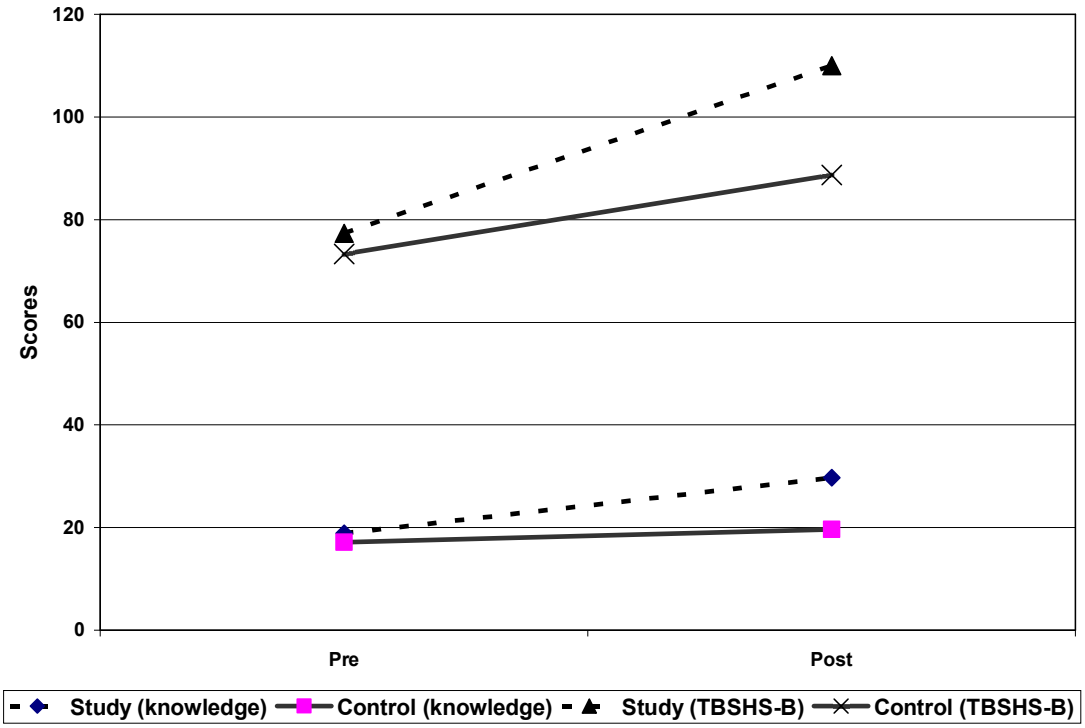

Figure 1: Pre-post total knowledge and Brief Burn Specific Health Status (BSHS-B) scores among patients in the study and control groups

Experts' opinions regarding burn knowledge assessment tool (No. of experts=7).

Items	Agree	
	Frequency	Percent
The used tool seems to assess patient's knowledge about burn injury	7	100.0
The words used in this tool are:		
Clear-	7	100.0
Correct-	7	100.0
Scientific-	6	85.7
Suitable-	7	100.0
Relevant	6	85.7
This tool serves the aim to assess patient's knowledge about burn injury	7	100.0
This tool can be used to determine patient's knowledge about burn injury	6	85.7
This tool is free from repetition among questions.	7	100.0
Parts of the tool reflect the pre-post assessment patient's knowledge about burn injury regarding the following:		
-Knowledge about burn injury natural (10 items).	7	100.0
-Management (4 items).	7	100.0
-Recommended diet (8 items).	7	100.0
Exercises (5 items).	7	100.0
The measure used is suitable and simple enough to determine nurse's knowledge about burn injury.	7	100.0

The great majority of the experts have agreed upon all items of the assessment tool and their percentages ranged between (85.7%) to (100%).

4. Discussion

This study was carried out to test the hypothesis that the implementation of a nursing rehabilitation program for patients with burn would lead to significant improvements in their knowledge, and their physical and psychosocial functioning. The study findings led to acceptance of the research hypothesis, as statistically significant improvements were demonstrated among patients in the study group after application of the rehabilitation program.

In order to show the effectiveness of the intervention, a control group similar to the study group patients was recruited, and the two groups were similar in all their demographic characteristics. There were slightly more males in the two groups. This might be attributed to occupational and recreational exposures among them, which is in congruence with ***Khan and Malik (2006)*** who reported a higher percentage of males among burn patients. Also, a high percentage of the patients were in the youngest age groups, below 35 years. This might be explained by more activity among this age group, which may predispose them to such incidents as also mentioned by ***Edlich et al.(2008)***.

In addition to similarity of the patients' socio-demographic data in the study and control groups, they also had the same burn characteristics. In both groups, most of the burns were due to open flame. This has been reported to be the most commonly encountered cause of burns in previous studies ***(Mabrouk et al., 2000; Maghsoudi et al., 2006)***.

Concerning the characteristics of the burn injury, most patients in both groups had multiple site burns, with a surface less than 20%. This is the most commonly encountered percentage of total body surface area for burns reported in burn centers ***(Willebrand et al., 2004)***. However, although the extent of the burns was mostly of moderate as classified by ***Schilling et al. (2004)***, the depth was mostly partial to full thickness. Nonetheless, no statistically significant differences were seen between study and control groups.

Concerning patients' knowledge about burns, the present study results revealed that the scores of patients in the study and control groups were generally low, with patients in the control group having better knowledge about treatment. However, after implementation of the rehabilitation program, the scores of patients in the study group demonstrated significant improvements, compared to the control group in all areas. The findings indicate success of the rehabilitation program, which is in agreement with the results of ***Belar (2000)*** and ***Mandal (2007)*** who reported similar improvements in the knowledge of patients with burn after implementation of educational programs.

The improvement in the knowledge of patients with burn in the study group was also associated with improvements in the scores of their Brief Burn Specific Health Scale (BSHS-B), which reflects improvements in their physical and psychosocial status. This again proves success of the rehabilitation program, which might be attributed to the content and process of the intervention, with more emphasis on patients' needs particularly those related to disturbed body image, personal relationships, and sexuality. The findings are in congruence with those of ***Mohamed (2003)*** who implemented a similar rehabilitation program at El- Minia General Hospital, and reported positive impact on patients' psychosocial status and physical functioning. Similar results were also reported by ***Sliwa et al. (2005)***.

The study findings revealed similar increasing trends between pre and post-tests on knowledge and BSHS-B scores. This points to an association between patients' knowledge and their physical and psychosocial status. The finding might be explained by the effect of having clear information on patient's psychological status, which would lead to more speedy and complete recovery. These results are in congruence with ***Baker et al. (2007)*** and ***Okhovatiana and Zoubine (2007)*** who demonstrated improved outcomes of patients with burn following rehabilitation programs that addressed patients' needs of information and psychological support.

The total scores of knowledge and BSHS-B demonstrated statistically significant improvements in both the study and control group patients after implementation of the rehabilitation program. However, the improvements were more obvious among patients in the study group. The improvements among control group patients might be attributed to contamination bias as some of these patients might have had access to the rehabilitation program materials as all the patients were in the same burn unit. This bias could not be avoided in the study setting, and might be considered as a limitation of the current study.

Conclusion and Recommendations

The study findings lead to the conclusion that burn patients are in need for information about burn injury and its management. Inclusion of such information in their rehabilitation program improves their knowledge, with consequent positive impact on their physical and psychosocial status.

Therefore, the study recommends implementation of this rehabilitation program for all patients with burn injury through the collaboration of various rehabilitation team members. Nurses should be trained in patient education and counseling in order to be able to successfully implement such program.

Corresponding author
Ola Abdel Aty
Medical Surgical Dept., Faculty of Nursing, Ain Sham University, Cairo, Egypt
ola.ahmed22@gmail.com

References

Ahmed G. ,2003. Impact of burn injury on self - image of adolescents. Unpublished Master Thesis, Faculty of Nursing, Cairo University, Egypt.

Baker P.C., Russell J.W., Meyer W., and Blakeney P. ,2007. Physical and psychological rehabilitation outcomes for young adults burned. Archives of Physical Medicine and Rehabilitation; 88 :S57-S64.

Belar D.C. ,2000. Psychological interventions and health: critical connections. Psicologia, Saude & Doencas.; 1 : 11-17.

Church D., Elsayed S., Reid O., Winston B., and Lindsay R. ,2006. Burn wound infections. Clin Microbiol Rev.; 19 :403-34.

Civaia A., Fedele C., Gallino A., and Oliva R. ,2003. the rehabilitative management of burn patients in the post-acute phase. Annals of Burns and Fire Disasters; 16 :1-7.

Edelman S.L. ,2007. Social and economic factors associated with the risk of burn injury. Burns.; 33: 958-965.

Edgar D., and Bereton M. ,2004. Rehabilitation after burn injury. BMJ.; 329:343-5.

Edlich F.R., Drake B.D., and Long B.W. ,2008. Burn, thermal. Retrieved on: htt://www.medscape.com

Heimbach D., Engrav L., and Gibran N. ,2003. Burn peals Seattle, WA: University of Washington Burn Center at Harbor view Medical Center.

Hosseini R.S., Askarian M., and Assadian O. ,2007. Epidemiology of hospitalized female burns patients in a burn centre in Shiraz. Eastern Mediterranean Health Journal., 13 : 113- 8.

Ignativicius D.D., and Workman M.L. ,2002. Medical surgical nursing-critical thinking for collaborative care. 4th ed., USA: Mosby, pp. 1555 - 86.

Jaiswal K.A., Aggarwal H., Solanki P., Lubana P.S., Mathur K.P., and Sudarshan O. ,2007. Epidemiological and socio-cultural study of burn patients in M.Y. Hospital, Indore, India.; 40 : 158-163.

Kazak E.A. ,2005. Evidence-Based Interventions for Survivors of Childhood Cancer and Their Families. Journal of Pediatric Psychology; 30 :29 -37.

Khan N., and Malik N. ,2006. Presentation of Burn Injuries and their Management Outcome, 56 : 394 – 97

Kildal M., Andersson G., Fugl-Meyer A.R., Lannerstam K., and Gerdin B. ,2001. Development of a Brief Version of the Burn Specific Health Scale (BSHS-B). The Journal of Trauma Injury, Infection and Critical Care.; 51: 740-46.

Lewis M.S., Heitkemper M.M., and Dirksen R.S. ,2004. Medical surgical nursing: Assessment and management of clinical problems. 6 th ed., Mosby, pp. 515-39.

Linton D.A., and Maebius K.N. ,2007. Introduction to medical – surgical nursing. 9 th ed., USA: Lippincot., pp. 1033-42.

Low G. ,2003. Developing the nurse's role in rehabilitation. Nurs Stand.; 17 :33-8.

Mabrouk A., El Badawy A., and Sherif M. ,2000. Kerosene stove as a cause of burns admitted to the Ain Shams burn unit. Burns; 26 : 474-77.

Maghsoudi H., Samnia R., Garadaghi A., and Kianvar H. ,2006. Burns in pregnancy. Burns; 32 : 246–50.

Mandal A. ,2007. Quality and cost-effectiveness - Effects in burn care. Burns. 33: 414-417.

Mohamed E. , 2003. The impact of rehabilitation program upon psychosocial status and physical functioning among burn patients. Unpublished Doctorate Thesis, Faculty of Nursing, Assuit University, Egypt.

Moi L.A., Wentzel-Larsen T., Salemark L., and Hanestad R.B. ,2008. Long-term risk factors for impaired burn-specific health and unemployment in patients with thermal injury. Burns; 1: 37- 45.

Mustonen K.M., and Vuola J. ,2008. Acute renal failure in intensive care burn patients (ARF in burn patients). Journal of Burn Care & Research; 29: 227-37.

Okhovatiana F., and Zoubine N. ,2007. A comparison between two burn rehabilitation protocols. Burns; 33 : 429-434.

Park S.Y., Choi K.A., Jang Y.C., and Oh S.J. ,2008. The risk factors of psychosocial problems for burn patients. Burns; 34:24-31.

Perry G.A., and Potter A.P. ,2004. Basic nursing: A critical thinking approach. 6th ed., Boston: Mosby, pp. 262-278.

Rochet J.M., and Zaoui A. ,2002. Burn scars: rehabilitation and skin care Rev Prat.; 52:2258-63

Schilling A., McCann N., Nieginsk E., Moreau D., Robinson M., Putterman A., Diehl S., Sciarra L., and Caplin M. ,2004. Straight: A's in Medical Surgical Nursing. Lippincott., pp.397-340.

Sliwa J.A., Heinemann A., and Semik P. ,2005. Inpatient rehabilitation following burn injury: Patient demographics and functional outcomes. Archives of Physical Medicine and Rehabilitation.; 86: 1920-23.

Slone D.S. ,2004. Nutritional support for the critically ill and injured patient. Crit Care Clin.; 20:135.

Summer G.J., Puntillo, K.A., Miaskowski C., Green P.G., and Levine J.D. ,2007. Burn injury pain: The continuing challenge. J. PAIN.; 8:533-48.

Timby K.B., and Smith E.N. ,2003. Introductory Medical Surgical Nursing. 8th ed., Lippincott. p. 1148-60.

Willebrand M., Anderson G., and Ekselius L. ,2004. Prediction of psychological health after an accidental burn. J Trauma; 57:367-374.

7/12/2011