

EFFECT OF AN EDUCATIONAL PROGRAM REGARDING CARE OF WOUND HEALING FOR VENOUS LEG ULCER PATIENTS'

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ABSTRACT

Background: Venous leg ulcers (VLUs) are chronic wounds that impose a substantial economic burden on world health care system and significant morbidity. venous leg ulcer patients' require special care for their wounds to promote healing and improving quality of their life. **Aim:** This study aimed to evaluate the effect of an educational program regarding care of wound healing for venous leg ulcer patients'. **Subjects and Method: Design:** A quasi-experimental research design was used in the current study. **Setting:** The study was conducted in general surgical units and outpatient clinic at El-Mansoura university hospital, Egypt. **Subjects:** A purposive sample included 50 patients with venous leg ulcer. **Tools:** Two tools were used for data collection; Socio-demographic data assessment tool and Bates-Jensen Wound Assessment tool. Data was collected from patients two times; one time before implementing the wound care program, and a second time after 12 weeks of its implementation **Results:** It revealed a statistically significant improvement in patients' wound healing after implementing educational program regarding venous leg ulcer care with (P-value = < 0.001) **Conclusion:** the study concluded presence of an improvement in patients' wound healing after implementing educational program. **Recommendations:** Conducting continues workshops for health care providers about traditional and new trends of dressing and wound care of venous leg ulcer. It is recommend conducting comparative study of effectiveness of different types of wound dressing on venous leg ulcer healing.

Key Words: Educational program, Venous Leg Ulcer Patients, Wound healing.

INTRODUCTION

A venous leg ulcer is a recurring chronic wound on the lower extremity caused by venous aetiology (Gohel, 2019). A venous ulcer is an opening in the skin of the leg or foot caused by chronic venous insufficiency and venous hypertension. Chronic venous insufficiency ulcers are linked to persistent venous hypertension as a result of CVI, which includes calf muscle pump failure, incompetent valves, and venous reflux (Practice & The,2019).

Venous leg ulcers (VLU) are defined as an open lesion between the knee and ankle joint that has not healed for at least four weeks and is caused by venous disease (Scottish Intercollegiate Guidelines Network) (NICE, 2020).

While performing patient evaluation, a thorough patient history and physical examination should be acquired, with an emphasis on risk factors, symptoms, and clinical signs (Giardina et al., 2017). A thorough history may reveal the ulcer's primary cause, and it should raise strong clinical concerns that may be verified by physical examination and appropriate investigations (Gohel, 2018).

Wound care begins with wound evaluation, which entails taking precise measurements of wound area, depth, volume, stage, infection symptoms, and healing capacity (Hopkins, 2020). Additionally, effective wound washing is necessary for wound therapy; cleansing eliminates organic and inorganic waste, loose necrotic tissue, and reduces the number of bacteria before applying the dressing. Cleaning a wound necessitates the use of a nontoxic preparation that can remove exudate, debris, and metabolic wastes while also promoting wound healing (Borgs et al., 2018).

The surgical nurse must know the etiology, healing steps, and wound care product to support the wound healing process and provide optimal care (Özyamaner, 2014). Furthermore, nurses who having sufficient knowledge and practices about the wound could prevent wound complications, shorten the healing process, and facilitate patient compliance(Sürme and Aydın Akbuğa, 2021).

Nurses play a crucial role in a patient's therapeutic success and result by utilizing strict aseptic technique, screening the solution for signs of contamination, constantly monitoring the patient before, during, and after an exchange, and recording his vital signs (Khudhair, 2018). Moreover, before applying the dressing, clean the wound to remove

organic and inorganic waste, loose necrotic tissue, and bacteria. Cleaning a wound demands the use of a nontoxic solution capable of removing exudate, dirt, and metabolic wastes while also aiding wound healing (Borgs, et al., 2018).

SIGNIFICANCE OF THE STUDY

Venous ulcers are chronic sores that cost the global health-care system a lot of money and cause a lot of morbidity in patients who have venous ulcer disease. Leg ulcers are a serious medical and social problem because they repeat. Physical (sleep quality, work capacity, mobility), psychological (appearance, concentration), social (interpersonal), and environmental (housing, financial resources, medical care) aspects all contribute to lower quality of life (Ścisło, 2015). As a result, venous leg ulcer patients require specific wound care to enhance healing and improve their quality of life. Therefore, it found that there is an indication to provide an educational program regarding care of venous leg ulcer for nurses who provided care to patients to improve patients' wound healing.

THE AIM OF STUDY

Was to evaluate the effect of an educational program regarding care of venous leg ulcer on patients' wound healing. This aim was achieved through:

- Assess level of patients' wound healing pre/ post implementing educational program.
- Design, Implement and evaluate an educational program for nurses regarding care of venous leg ulcer

Research hypotheses:

- The patients' wound healing levels will be improved after implementing educational program regarding care of venous leg ulcer.

SUBJECTS AND METHOD

Design:

A quasi-experimental research designed was used in the current study

Setting:

This study was carried out in general surgical units (five surgical departments) and outpatient clinic (vascular surgery clinic) at El-Mansoura university hospital, Egypt.

Subjects:

A purposive sample of 50 patients with venous leg ulcer. All adult venous leg ulcer patients' admitted to general surgical units and surgical outpatient clinics during the time

of data collection (6 months) and have the included criteria of the study participants were invited to participate in the study.

Inclusion criteria for patients:

- Adult patients from both sexes.
- Conscious patients.
- Patient should follow with the same nurses.

Exclusion criteria of patients:

- Diabetic patients.
- Underweight and obese patients.

Tools of data collection:

Two tools were used in the current study

Tool (I): A questionnaire cover Three parts;

Part one: Patients socio demographic characteristic

As age, gender, level of education, marital status, occupation.

Part two: Medical history and surgical history

As Chronic diseases, Cardiovascular disease, Osteoporosis, Rheumatoid arthritis, Previous venous leg ulcers, and Previous surgery in leg.

Part three: Family history of chronic diseases

As cancer, heart diseases, hypertension , and diabetes mellitus.

Tool (II): Bates-Jensen Wound Assessment tool:

This tool was adapted from (Bates-Jensen& Sussman, 2012) to assess wound status and modified by the researcher on anatomic site as (Lateral and Medial ankle) based on related literature (NICE, 2020 and Khanna & Tiwary, 2016). It was used to assess patient's wound status, which consisted of 13 item such as size, depth, edges, undermining, necrotic tissue type, necrotic tissue amount, exudate type, exudate amount, skin color surrounding wound, peripheral tissue edema, peripheral tissue induration, granulation tissue and epithelialization.

Scoring system and degree of severity:

Thirteen assessment parameters are measured on a scale ranged from 1 to 5; the greater the total score, the more severe the wound condition. After recording the data and completing the scale, a total was calculated using all thirteen criteria and plotted on a linear chart. The overall score ranged from one (Tissue Health) to thirteen (Wound Regeneration) to sixty-five (Wound Regeneration) (Wound Degeneration). It was translated from English to Arabic, with a content validity agreement rate of 0.82 and a Cronbach internal consistency of 0.85. (Serag, 2016)

Educational program of venous leg ulcer care:

Developing educational program regarding venous leg ulcer care after reviewing relevant literature: (Norman et al., 2017& Wound, Ostomy and Continence Nurses Society, 2019 and Taylor et al., 2017). It contained the following parts; introduction

about venous leg ulcer as definition, causes, risk factors, symptoms, prevention ways in people at risk . Moreover, wound healing stages, factors affected wound healing and wound care which emphasized on base of wound care, ideal wound dressing, complete ulcer assessment according to Bates-Jensen Wound Assessment tool, compression therapy and types of wound dressing.

Pilot study:

A pilot study was carried out with the purpose of assessing the feasibility, objectivity and applicability of tools and estimate the proper time required for filled in each tool. It was conducted on 5 patients(10%) from previously mentioned setting and it was conducted over a period of two weeks before embarking on fieldwork of the study. After obtaining the result of the pilot study, the necessary modifications were done as (patients' occupation, work hours), and the final form was developed. The patients included in the pilot study were excluded from the main sample.

Field work:

The data collection was conducted from the beginning of (September 2020) till the end of (February, 2021). The study was carried out in the following sequence:

- 1- Obtaining the administrative permissions for the study from the faculty of nursing, Port Said University, and the directors of the study settings.
- 2- Verbal consents were obtained from each participant (patients and nurses) to be included in the study after explaining clarification of the nature and purpose of the study.
- 3- Implementation of the educational program:

During this phase, the following steps concerned by the researcher

Step1: Assess patients' wound healing pre- implementing educational program at the general surgical units and surgical outpatient clinics in El- Mansoura university hospital. This step took 8 sessions, and each session took 4 hours, from 9AM to 1 PM. The researcher was available 2 days/ week (Monday and Thursday). Every session, the researcher assess wound status during dressing ; after the nurse remove old dressing, the researcher put the patient in comfortable position as semi fowler position or sitting position then assess venous leg ulcer according to items of Bates-Jensen Wound Assessment tool.

Step 2: Implementing the Venous Leg Ulcer care educational program. The program took around two months (two sessions per week; each taking 4 hours). Every session was divided to theoretical session and practical session as the following: The researcher gathered the studied nurses who work at the general surgical units and surgical outpatient clinics in Hospital lecture hall in accordance with their schedule and duties then gave them theoretical lecture using PowerPoint presentations and handouts, which covered all objectives of educational program as definition, causes, symptoms.....,etc. It took around 2 hours every session

Also, the researcher teach the studied nurses wound assessment and ideal dressing technique regarding venous leg ulcer by explaining steps of wound assessment tool and wound care practice checklist using educational videos as wound dressing procedures and photos. Then, the studied nurse re- demonstrate dressing procedure on real venous

leg ulcer patient under researcher observation. This practical session took around 2 hours. The researcher was available 3 days/week (Sunday, Tuesday, and Thursday) from 9 AM to 1 PM.

Step 3- Program evaluation:

this phase was carried out after three months post- program implementation, and it was accomplished in 8 sessions, each session took 4 hours, from 9 AM to 1 PM. The researcher was available 2 days/ week (Monday and Thursday). Every session, the researcher assess wound status during dressing ; after the nurse remove old dressing, the researcher put the patient in comfortable position as semi fowler position or sitting position then assess venous leg ulcer according to items of Bates-Jensen Wound Assessment tool. The studied patients pre- program implementation were the same post program implementation.

Ethical Consideration:

An approval was taken from Research ethic committee of faculty of nursing, port said university. Moreover, an approval was taken from hospital director to participate in the study after explanation the study aim. In addition, an approval was taken from each patient after explanation of the study aim and detail data collection process to be familiar with the importance of his /her participation. In addition, a brief and comprehensive explanation of the study was given to assured nurses that the information obtained will be confidential and used only the purpose of the study.

The studied patients were informed that their participation is voluntary &they have the right withdraw from study at any time without rationalization. Additionally, all data collected from the studied subjects was processed in a total confidentiality. Moreover, the process of data collection was not disturbing the harmony of the work of the above-mentioned setting.

IV-Statistical Analysis:

- The collected data were coded and analyzed using Statistical Package for Social Science (SPSS) version 22.
- Tabulated frequencies and percentages were calculated.
- A significant level value was considered when $p\text{-value} \leq 0.05$, while $p\text{-value} > 0.05$ indicates non- significant results.

RESULTS

Table (1a): reveals that, approximately a third of the studied patients 34% were at age group 50 to < 60 years, most of the studied patients 88% were male, more than one third of the studied patients 36% were 75to 80kg, more than three quarters of the studied patients 78% were 170 to 180 cm, more than half of the studied patients 58% were read and write, more than half of patients 54% were worker, most of patients 84% were married, more than half of patients 52% had one to three kids, more than one third of patients 42% work

more than 8 hours, and the majority of the studied patients 98% do not have enough income for treatment.

Table (1b): illustrates that, more than one third of the studied patients 34% had chronic diseases; 18% of them suffered from hypertension, 4 % of them had osteoporosis, cardiovascular diseases, urinary system diseases, and liver diseases. All of the studied patients 100% had recent referral; 98% of them had peripheral vascular disease, 16% of them had orthopedic, whereas 44% of them had previous venous leg ulcers, and 36% of them had previous surgery in leg; 18% of them had microphlebectomy surgery, and 2% of them had Sclerotherapy for varicose vein surgery.

Table (1c): shows that, 16% of the studied patients had family history of chronic disease; 2% of them had cancer, 8% of them had hypertension, none of them had heart disease and 8% of them had diabetes mellitus.

Table (2): represents that, there was statistically significant difference between total wound assessment in pre- program implementation and after three months post- program implementation whereas ($p \leq 0.05$).

Table (3): shows that, there was statistically significant relationship between socio demographic data and total wound assessment pre-program and total wound assessment after 3 months post-program in area of occupation and educational level whereas ($p \leq 0.05$), while there was statistically significant relationship between socio demographic data and total wound assessment pre-program in area of Working hours (worker &employee) whereas ($p \leq 0.05$).

Table (1A): Socio-demographic characteristics of the studied patients (n=50)

Socio-demographic characteristic	No	%
Age in years		
30 to < 40 years	11	22.0
40 to < 50 years	13	26.0
50 to < 60 years	17	34.0
60 to 70 years	9	18.0
Sex		
Male	44	88.0
Female	6	12.0
Weight		
65-70kg	6	12.0
70-75kg	16	32.0
75-80kg	18	36.0
80-85kg	10	20.0
Height		
160-170 cm	11	22.0
170-180 cm	39	78.0
Education level		
Illiterate	14	28.0
Read and write	29	58.0
Basic education	5	10.0
Secondary Education	2	4.0
Occupation		
Not work	14	28.0
Employee	3	6.0
Worker	27	54.0
House wife	5	10.0
Retired	1	2.0
Marital Status		
Married	42	84.0
Single	7	14.0
Divorced	1	2.0

Kids number		
None	8	16.0
One to three kids	26	52.0
Four to six kids	16	32.0
Working hours (worker & employee)		
Less than or equal 8 hours	12	24.0
More than 8 hours	21	42.0
Income / cost of treatment ratio (from patients' point of view)		
Not enough	49	98.0
Enough	1	2.0

Table (1b): medical history of the studied patients (n=50).

Medical history	Yes		No	
	No	%	No	%
Chronic diseases	17	34.0	33	66.0
Hypertension	9	18.0	41	82.0
Cardiovascular disease	2	4.0	48	96.0
Urinary system disease	2	4.0	48	96.0
Osteoporosis	2	4.0	48	96.0
Liver diseases	2	4.0	48	96.0
Rheumatoid arthritis	3	6.0	47	94.0
Respiratory diseases	0	0	50	100
Recent Referral	50	100	0	0
Dermatological disease	0	0	50	100
Peripheral Vascular disease	49	98.0	1	2.0
Orthopedic	8	16.0	42	84.0
Surgery	0	0	50	100
Ophthalmic	0	0	50	100
Peripheral nerves	0	0	50	100
-Previous venous leg ulcers	22	44.0	28	56.0
Previous surgery in leg	18	36.0	32	64.0
Type of this surgery	No		%	
Skin graft	6		12.0	
Arteries clearance	9		18.0	
Microphlebectomy	1		2.0	
Sclerotherapy for varicose vein	2		4.0	

Table (1c): family history of chronic disease of the studied patients (n=50):

Family history	No	%
Family history of chronic disease		
No	42	84.0
Yes	8	16.0
Cancer		
No	49	98.0
Yes	1	2.0
Hypertension		
No	46	92.0
Yes	4	8.0
heart disease		
No	50	100.0
Yes	0	0.0
Diabetes mellitus		
No	46	92.0
Yes	4	8.0

Table (2): Patients' wound healing pre- and after 3 months implementing venous leg ulcer care program (n=50).

Healing scale	Pre- program	Post-program (after 3 months)	Test t-test
	Mean ± SD	Mean ± SD	
Bates – Jensen wound assessment	34.04 ± 5.13	29.08 ± 3.49	t= 7.087 p= <.001*

Paired t- test

*Sig. the p- value for test ≤ 0.05

Table (3): Relation between wound healing assessment and patients' socio-demographic characteristics(n=50).

Socio-demographic characteristics	total wound assessment (pre-program)		total wound assessment (after 3 months) post-program	
	Mean \pm SD	Test of Sig	Mean \pm SD	Test of Sig.
Age in years				
30 to < 40 years	33.18 \pm 4.07	F= .437 P= .727	29.82 \pm 1.66	F= 1.522 P=.221
40 to < 50 years	34.23 \pm 4.30		30.38 \pm 4.89	
50 to < 60 years	33.59 \pm 7.08		27.94 \pm 3.23	
60 to 70 years	35.67 \pm 2.87		28.44 \pm 2.74	
Sex				
Male	33.59 \pm 4.11	t= -1.707	29.32 \pm 3.48	t= 1.364
Female	37.33 \pm 9.93	P= .094	27.33 \pm 3.33	P= .218
Education level				
Illiterate	34.57 \pm 4.15	F= 4.160 P= .011	29.71 \pm 3.17	F= 3.911 P= .014
Read and write	33.00 \pm 3.45		27.97 \pm 2.86	
Basic education	34.20 \pm 6.53		32.20 \pm 5.31	
Secondary Education	45.00 \pm 16.97		33.00 \pm 1.41	
Occupation				
Not work	35.00 \pm 2.57	F= 2.917 P= .023	30.36 \pm 3.18	F= 7.078 P= .000*
Employee	43.33 \pm 12.34		35.33 \pm 4.16	
Worker	32.80 \pm 4.43		28.07 \pm 2.83	
House wife	33.40 \pm 2.70		26.00 \pm .71	
Retired	35.00 \pm .		30.00 \pm .	
Marital Status				
Married	34.14 \pm 5.39	F= .309 P= .736	29.00 \pm 3.76	F= .078 P= .925
Single	33.00 \pm 3.74		29.43 \pm 1.51	
Divorced	37.00 \pm .		30.00 \pm .	
Working hours (worker &employee)				
Not applicable	34.59 \pm 2.60	F= 4.458 P= .017	29.76 \pm 3.29	F= 2.001 P= .146
Less than or equal 8 hours	37.00 \pm 7.77		30.08 \pm 4.14	
More than 8 hours	31.90 \pm 3.96		27.95 \pm 3.06	

statistically significance ($p \leq 0.05^$)

F means ANOVA test , t means t- test

DISCUSSION

Regarding the socio-demographic characteristics of the studied patients, this study revealed that approximately a third of the studied patients were at age group 50 to < 60 years old, which might explain that the most of venous leg ulcer patients were old adult. This result was agreed with (Zulec et al., 2019) which found that the prevalence of venous leg ulcer increases with age. Moreover, most of patients were married, more than half of patients had one to three kids and the majority of patients had insufficient income

to cover the cost of their treatment that might explain that the most of patients had low socioeconomic status.

Regarding gender, the result of the present study showed that the most of the studied patients were males. This result was disagree with (Hagenstrom et al., 2018) which mentioned that more than half of the patients were females. Furthermore, more than half of the studied patients could read and write. This was consistent with (AbouZaid et al., 2020), who found that the majority of the patients could read and write.

Moreover, concerning patients' occupation, the current study found that more than two thirds of the studied patients were workers, which might explain that their occupation needs to more effort and prolonged time of standing or setting. This is in accordance with (Khanna & Tiwary, 2016) which mentioned that a sedentary style habits such as jobs involving prolonged sitting or standing especially among men can precipitate venous leg ulcer.

The result of the current study revealed that, all of the studied patients had recent referral. From the researcher point of view, the studied patients had an active venous ulcer and some of them had a previous venous leg ulcer and physician need to know the specific cause of disease. The majority of these referrals were for peripheral vascular disease; this may be because venous hypertension and chronic venous insufficiency were a major risk factor of Venous Leg Ulcer (VLU). This is consistent with (Evans et al., 2019), which mentioned that, venous leg ulcer is associated with sustained venous hypertension due to chronic venous insufficiency.

Additionally, (Nelson et al., 2006) identified previous ulcers as a risk factor for venous leg ulcer healing and recurrence rates. The finding in present study showed that approximately half of the studied patients have a previous venous leg ulcer. This is probably because most of the patients included in this study had an active venous ulcer for decades.

The current study elicited that, the mean score of patients' wound healing was decrease post- implementing venous leg ulcer care program compared with pre-program implementation, which indicated the improvement of patients' wound healing (wound regeneration). this explain the finding result that there was statistically significant relationship between total wound assessment in pre- program phase and total wound assessment in post- program phase.

This study did not provide evidence of associations between wound healing and patient characteristics (as age, male gender and marital status). This result is similar to the study of (Weller et al., 2020) which mentioned that there was no evidence that patient characteristics (like age, male gender) were associated with improved wound healing outcomes. These data suggest that patient characteristics are directly relevant to initially developing an ulcer may have a more indirect relationship with wound healing.

The current study revealed a statistically significant relationship between patients' occupation and total wound assessment pre-program and after three months post-program implementation. This might refer to that, more than half of patients were worker and this is interpreted the relation between patients' occupation and VLU as mentioned before. In addition, compliance with dressing and compression therapy especially after three months post-program implementation could lead to improve wound healing.

The present study found a statistical significant relationship between patients' educational level and wound healing assessment pre-program and after three months post-program implementation. This may be refer to that, more than half of studied patients are read and write. Therefore, these patients could obtain knowledge about wound care and compliance with treatment and dressing from many resources as other patients, health care providers and their sons, in addition to different types of media as advertisements and medical programs in television.

The current study elicited that, there was statistically significant relationship between patients' working hours and wound healing assessment pre-program implementation. This might be due to more than one third of patients work more than eight hours daily and receive poor wound dressing care and compression therapy pre-program implementation by nurses. As a result, this reflects on patients' wound healing, while after three months post- program implementation, these patients received a satisfactory wound care which leads to improve wound healing.

CONCLUSION

Based on the results of the current study, it can be concluded that; the implementation of an educational program for nurses about venous leg ulcer care has positive effects on wound regeneration

RECOMMENDATIONS

Given the most important study findings, the following recommendations are suggested.

- Conducting continues workshops for health care providers about traditional and new trends of dressing and wound care of venous leg ulcer.
- Further research is required study to the factors affecting wound healing.

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تأثير برنامج تعليمي للمرضين تجاه العناية بالقرحة الوريدية بالساق على التئام جرح المرضى

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الخلاصة

تعتبر قرحة الساق الوريدية هي جروح مزمنة تفرض عبئاً اقتصادياً كبيراً على نظام الرعاية الصحية العالمي لذلك يحتاج مرضى قرحة الساق الوريدية إلى رعاية خاصة لجروحهم لتعزيز الشفاء وتحسين نوعية حياتهم. صممت هذه الدراسة شبه تجريبية لتقييم أثر برنامج تعليمي خاص بالعناية بقرحة الساق الوريدية على التئام جرح المرضى في وحدات الجراحة العامة والعيادات الخارجية بمستشفى جامعة المنصورة. وقد اجريت هذه الدراسة على 50 مريض . تم إعطاء طاقم التمريض برنامج تعليمي تمريضي حول العناية بقرحة الساق الوريدية واستغرق حوالي شهرين و تقييم كفاءته على التئام جروح المرضى (قبل البرنامج، و بعده ب 12 أسبوع). أظهرت نتائج الدراسة عن تحسن في حالة جروح المرضى بعد تطبيق البرنامج التعليمي وتدعم نتائج هذه الدراسة فرضيات البحث وأوصت نتائج الدراسة الحالية على اجراء ورش عمل مستمرة لمقدمي الرعاية الصحية حول الاتجاهات التقليدية والجديدة للتضميد والعناية بجرح قرحة الساق الوريدية.

الكلمات المرشدة: قرحة الساق الوريدية ، المرضى، البرنامج التعليمي، التئام الجرح