Effect of Tele-nursing Intervention on Knowledge and Quality of Life for Patient with Chronic Venous Leg Ulcer

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Abstract

Tele-nursing can provide patients with leg ulcers access to educational resources and self-management tools. Also empower patients with knowledge and skills to manage their condition. **Purpose:** to determine the effect of Tele nursing intervention on Knowledge and Quality of Life for Patient with Chronic Venous Leg Ulcer. **Design:** Quasi experimental research. **Setting:** The study was conducted at the surgical department and outpatient clinics at Menoufia University Hospital- Egypt. **Subjects:** Eighty patients with venous leg ulcers were randomly assigned into two groups; study group (receiving educational telephone follow-up interventions) and control group (Receiving hospital management instruction). **Instruments: I)** Structured interviewing questionnaire; it includes**:** Socio-demographic and Medical data. **II)** Knowledge assessment questionnaire. **III)** Short Form – 12 Health Survey quality of life questionnaires. **Results:** There was statistically improvement in the mean total knowledge score in study group compared to control group post conducting tele-nursing intervention (from 21.42& 19.87 to 48.22&29.52) respectively. The mean QoL scores were changing from (30.42±1.81&30.30±1.22 to 31.95±1.75 & 30.70±1.34) in study and control group pre and post tele-nursing intervention (after 12 month) respectively, with statistically significant difference. **Conclusion:** Tele-nursing intervention has a great effect on enhancing quality of life of patient with chronic venous leg ulcer. **Recommendation:** Tele nursing approach should be utilized to facilitate nursing tasks and safely and effectively improve patients' quality of life is a part of systematic nursing practice.

Keywords: Quality of life, Tele-nursing intervention & Venous leg ulcer.

Introduction

Venous Leg Ulcers (VLUs) are the most common type of leg ulcer with a significant socioeconomic burden due to slow healing. VLUs are a common and costly problem worldwide; prevalence is estimated to be between 1.65% to 1.74% in the western world. The prevalence of VLUs differs between 1.5% and 3% in the general population. VLUs are recurrent wounds on the lower extremity that is chronic in nature **(Onida et al., 2021)**.

A venous ulcer is known as a major and snowballing threat to public health due to legs brought on by venous hypertension as well as chronic venous insufficiencies. Due to Chronic Venous Insufficiencies (CVI), which comprises calf muscle pumping failure, ineffective valves, and venous refluxes, ulceration is usually associated with persistent venous hypertension **(Liu et al., 2019 & Mościcka et al.,2019).**

Furthermore, once healed, they are associated with a high recurrence rate estimated at 39% at 6 months and 57% at one year. A complete clinical history and physical examination must be obtained when completing a patient evaluation, with a focus on risk variables, complaints, and clinical signs **(Onida et al., 2021).** A detailed history can raise serious medical issues that can be confirmed by a physical examination and the relevant diagnostics in order to determine the main cause of the ulcers **(Haynes & Holloway 2019).**

Ulcer assessment, which comprises collecting exact measurements of the wound's location, depth, size, phase, infectious indications, and recovery potential, is the first step in wounds treatment **(Raffetto et al., 2020).** Furthermore, efficient wounds cleaning are required for wounds care; prior to putting the dressing, cleansing gets rid of organic and inorganic debris, droopy necrotic tissues, and fewer microorganisms **(Weller et al., 2021).** A nontoxic solution that could also eliminate exudates, debris, and metabolic wastes whilst simultaneously accelerating wounds healing is required for cleaning wounds **(Davies et al., 2019).** Nurses play a critical part in a patient's therapeutic success by using strict aseptic techniques, checking the solutions for contaminants, closely observing the patients before, during, and after each exchanging, and documenting his vital signs **(Barnsbee et al., 2019).** This complex situation has a big impact on quality of life without longitudinal investigations, it is impossible to

determine what factors raise or lower health-related quality of life (HRQOL). Nursing care has traditionally concentrated on wounds management instead of the individuals as a whole **(Cifuentes, & Guerrero 2020).** This is corroborated by the lack of evidences that any results about HRQOL in individuals with chronic leg ulcers have changed how these patients are treated on a day-to-day basis but today with technology nurse can care of patient from all dimension of life **(Shanley et al., 2020)**.

Significance of the Study

Leg ulcers are a serious medical and social problem since they regularly recur. Only 60% of patients are typically healed by 12 weeks on average, and once recovered, 75% experience a recurrence within 3 weeks **(Probst, et al., 2021).** Untreated or poorly management leg ulcers can lead to complications as tissue necrosis, ulcer enlargement and even amputation. These complications can result in long term disability and further diminished the individual quality of life **(Vance & Durbin, 2021)**

Tele-nursing enables regular communication between patients and nurses, fostering a continuous care relationship. Nurses can monitor the patient's condition over time, track changes in wound status, and intervene promptly if complications arise. This ongoing support can enhance patient satisfaction, reduce anxiety, and increase confidence in self-management**.** Nurses can offer guidance on nutrition, exercise, medication adherence, and lifestyle modifications. Empowering patients with knowledge and skills to manage their condition can lead to a sense of control, improved self-esteem, and a higher quality of life **(Gethin et al., 2020)** Owing to the many advantages of telenursing and the potential for this technology to enhance patient education, the researcher carried out this study to encourage patients to take an active role in their own care.

Purpose of the study:

To examine the effect of tele-nursing intervention on knowledge and quality of life for patient with chronic venous leg ulcer.

Research hypotheses:

1. Patients who receive tele-nursing intervention are expected to have good knowledge score about leg ulcer and its management compared to patients who don't receive the intervention.
2. Patients who receive tele-nursing intervention are expected to have an improvement in quality of life compared to patients who don't receive the Tele-nursing intervention.

Methods
Design:

A Quasi-experimental (study/ control group) research design was utilized.

Setting:

The present study was conducted in the surgical department and outpatient clinics at Menoufia University Hospital- Egypt.

Subjects:

A convenient sample of 80 adult patients diagnosed with chronic venous leg ulcer matching the following inclusion criteria a) Adult patients from both sexes b) Conscious patients. c) Able to communicate and follow instructions. The patients were excluded if they had; underweight which affects on the normal process of the wound healing stages and obese patients leads to high pressure in the legs veins.

Sample Size Calculation

The following formula is used to calculate the size of the required sample

$n = (z)^2 p (1 - p) / d2$

Where: n is Sample size,

z = level of confidence according to the standard normal distribution (for a level of confidence of 95%, z = 1.96)

p= estimated proportion of the population that presents the characteristic 3% = (0.03)

d = tolerated margin of error (for example we want to know the real proportion within 5%)

$n = (1.96)^2 \times (0.03) \times (1\text{-}0.03) / (0.05)^2$

= 3.8416×0.03×0.97/ 0.0025

=0.11179056 / 0.0025 = 44

N= 44 for each group. 4 patient withdraw

Instruments of data collection:
Tool I: Structured interviewing questionnaire:

It was constructed by the researchers to collect data about socio-demographic charactrics. It covered the following two parts:

Part one: Socio-demographic data: It comprised of eight items related to patients' age, gender, marital status, educational level, occupation, smoking, living status and biophysiological measurements that include weight, height, Body Mass Index (BMI)

Part two : Medical data: which inculde items about presence of venous leg ulcer, history of DVT, history of varicose veins, previous injury to leg, previous surgery, chronic edema, presence of co-morbidities, duration of longest ulcer and (CEAP classification of VLU) which refer to Clinical manifestation of chronic venous disorders (C), understanding of the Etiological (E), Anatomical (A), and Pathophysiological (P). CEAP is used to understand severity of venous disease and the assessment of treatment efficacy.

Tool II: Knowledge assessment questionnaire: it was developed by **(Ovington, 1999)** to assess patient' knowledge about leg ulcer. It comprised of twenty multiple-choice items which categories into Inadequate, Sufficient, Good & Very good.

Scoring system: score of each item ranged from 0 to 3; where zero denoted inadequate, one indicates sufficient, two indicates good & three indicates very good; then all scores were summed. The total score was ranged from twenty to sixty. The researcher obtained the mean score of knowledge.

Reliability

The total inter-class correlation coefficient was 0.88 (95% confidence interval [CI]: 0.79–0.93, P <0.001). Between 0.74 (95% CI = 0.67-0.79, P <0.001) and 0.94 (95% CI = 0.87-0.96, P <0.001) were found for the narratives in terms of test-retest reliability (Beeckman D., et. al., 2010).

Validity

Internal validity was established in the current study using (2-tailed) 0.05 and internal consistency (r =0.89 p-value <0.001), while test re-test reliability using Cronbach's alpha was 0.89.

Tool III: Short Form – 12 Health Survey Quality of Life questionnaires (English version)

A health-related quality-of-life survey called the SF-12v2 was created by the University of California, San Francisco, and consists of twelve items measuring eight different health areas. General Health (GH), Physical Functioning (PF), Role Physical (RP), and Body Pain (BP) are variables associated with physical health), daily activities, problems with work, feeling & emotional problems, Physical health or emotional problems interfered with social activities (**Ware et. al., 1996).**

Scoring system: Scoring ranging from 0 to 100. Higher scores indicate improved mental and physical performance. It has been suggested that a cut-off level **point** of 50 on the PCS-12 used to identify a physical condition, whereas a rating of 42 or less on the MCS-12 could be suggestive.

Reliability: For internal consistency, a Cronbach alpha value of 0.7 or higher is regarded as satisfactory. Cronbach alpha values for PCS and MCS were 0.86 and 0.87 respectively. These show a significant level of internal consistency. Compared to MCS, PCS exhibited a higher intra-class correlation coefficient (0.79) than MCS, which was only 0.59. These findings show that PCS has strong test-retest reliability while MCS has just fair test-retest reliability.

Validity

The SF-12-scale Mental Health is associated most strongly with the validation criteria; Mosier's alpha was 0.70 for the Physical Composite Scale (PCS) and 0.69 for the Mental Health Composite Scale (MCS), indicating good internal consistency. We observed strong correlations between physical functioning, physical role, and body pain scales (r = 0.55–0.56), and between social functioning, emotional role, and mental health (r = 0.53–0.58). We calculated split-half

reliabilities to be 0.74 for physical functioning, 0.75 for the physical role, 0.73 for the emotional role, and 0.65 for mental health respectively.

Methods:

Formal approval: An official permission was obtained from hospitals' director and the head nurse of outpatient clinics after an explanation of the study's aim.

Instruments development: After comprehensive reviewing the literature, the study instrument I was constructed by the researchers while the second and third instruments were adopted from (**Ovington, 1999 & Ware et al., 1996)** respectively.

Pilot study: A pilot study was conducted prior to data collection on 8 patients (10%) to test all instruments for clarity, objectivity, feasibility and applicability and application of the tools and to determine the appropriate amount of time needed to complete each item. It was completed on eight cases (10% of the total) from the earlier indicated settings. The final form was created once the required adjustments were made based on the pilot study's findings. The participants from the pilot research study were not included in the final sample.

Ethical considerations and human rights:

- An official approval was obtained from ethical and research committee of the faculty of nursing Menoufia University. Research No (850)
- Oral or Written consent to participate in the study was obtained from all participants after explaining the study's aim.
- The participants who were being examined were made aware that their involvement was optional and that they had the ability to discontinue the research at any moment without explanation. Furthermore, all information gathered from the participants in the study was handled with complete confidentiality. Additionally, the data collection process did not interfere with the efficiency of the aforementioned setting's functioning.
- Data was collected over a period of 12 months from the beginning of June 2021 to the beginning of June 2022.

Data collection procedure:

First from start of (June, 2021) through the beginning of (June, 2022), data were collected. The below procedures were followed when conducting this research:

1- Following describing the scope and goal of the research to each patient, verbal agreement was sought out of each respondent.
2- Participants of control group were received only routine hospital care.
3- Implementing the educational program:

Educational program of venous leg ulcer care:
Step (1): the researcher met each patient individually in the surgical outpatient clinics in the Menoufia University hospital. Using instrument I, II, III to obtain baseline data & assess patient' wound.

This session took about 30 to 45 minute. Then the researcher met the patient to provide him with the necessary information about disease and how to deal with wound care and reassure patient & provide each patient a colored booklet with illustrated pictures about the disease; causes, signs and symptoms, complications, and the importance of nutrition as a part of wound healing

Step (2): Establishment of Tele-nursing intervention program for venous leg ulcer caring. The sessions lasted two months (two sessions per week; each taking 30 min). The researcher utilized telephone interventions **(phone, E mail and whats App)** based on the patient's responses to each item. Knowledge about disease, methods of pain relive, types and benefits of compression therapy followed. Special attention was paid to the importance of maintaining regular body and foot hygiene as well as promoting exercise. Descriptions of the positions of the body at rest and nutrition advice were given. Pictures of leg exercises were shown, and special attention was given to activities for people with limited mobility. Also, instruction about healthy lifestyle modifications as cessation of smoking and compliance with treatments. Colored booklet with wound care illustrated in pictures was given to the participants.

Whenever the researcher determined that a patient required an in-person re-evaluation or procedures, the hospital's medical personnel was called.

The researcher also was responsible for collecting the data to recognize patient's health-related quality of life factors. Define the events that a patient could engage in on a normal day, the difficulties that his physical health has caused in the past four weeks with his career or other daily routines, and the percentage of time that his physical or emotional issues have impeded with his social events (such as contacting with friends or relatives, etc.)

The researcher met each patient after one month to reevaluate patient 'condition then after three months, post six months until twelve months at the end of program. Based on previous researches.

- The control group's participants underwent standard follow-up. The normal follow-up care utilized at the hospital was calling them to set up medical visits at the outpatient clinics. Participants typically get a standardized discharging plan during these visits.

Five distinct assessments were conducted on participants in both groups:

- **Pre-test** following surgery, between 24 and 48 hours, when the patients remained in the hospital.
- **After one month** during the participant's follow-up appointment with a doctor 4 weeks following surgery.
- **After three months** following surgery, during the participant's follow-up appointment with a doctor, and may be following surgical discharging.
- **After six months** following surgery, during the participant's follow-up appointment with a doctor and maybe following surgical discharging.
- **After 12 months** following surgery, during the participant's follow-up appointment with a doctor and maybe following surgical discharging.

Statistical Analysis:
Statistical Package for Social Science (SPSS) version 26 was used to organize and analyze the acquired data. The qualitative variables were reported as a number (%) and the quantitative variables as mean ± SD. When the p-value was ≤0.05, a significant level score was taken into consideration, whereas a p-value of > 0.05 indicated non-significant outcomes. A long with the following analytical metrics:

- Paired sample t-test (parametric test): is a statistical test of significance used to compare two related groups of quantitative variables that are normally distributed.
- Student t-test (parametric test): is a statistical test of significance used to compare two independent sets of numerical variables that are normally distributed.
- When the ANOVA test is significant, post hoc analyses are employed to identify particular differences between the means of three or more groups.
- ANOVA test (parametric test): is employed to compare more than two independent sets of quantitative variables that have a normal distribution.
- Pearson Chi-square test (χ^2): to investigate the relationship between two qualitative data. (Daniel, 1999).

Results

Table (1): Scoidemographic data of the studied patients with chronic venous leg ulcer (N=80).

Variables	Study group (N =40)		Control group (N =40)		Total (N =80)		χ^2 P
	N	%	N	%	N	%	
Sex:							
Male	25	62.5.0%	22	55.0%	47	58.75%	0.362
Female	15	37.5%	18	45.0%	33	41.25%	0.372
Age years:							
Range	40-57		40-57		40-57		
Mean±SD	46.73±2.86		47.74±3.68		47.37±4.15		
t-test	2.136						
P	0.271						
Marital status:							
Single	34	85.0%	36	90.0%	70	87.5%	0.634
Widowed	6	15.0%	4	10.0%	10	12.5%	0.286
Occupation:							
Worker	13	32.5%	14	35.0%	27	33.75%	1.542
Employee	15	37.5%	14	35.0%	29	36.25%	0.539
Not working	10	25.0%	11	27.5%	21	26.25%	
Retired	2	5.0%	1	2.5%	3	3.75%	
Educational level:							
Illiterate	10	25.0%	11	27.5%	21	26.25%	2.78
Primary	12	30.0%	12	30.0%	24	30.0%	0.395
Secondary	9	22.5.0%	11	27.5%	20	25.0%	
High education	9	22.5%	6	15.0%	15	18.75%	
Smoking:							
Yes	22	55.0%	19	47.5%	41	51.25%	0.357
No	18	45.0%	21	52.5%	39	48.75%	0.425
Living status:							
Living alone	7	17.5%	4	10.0%	11	13.75%	1.528
Body Mass Index (BMI)							
Range	23.18-24.26	23.25- 31.63				86.25%	0.367
Mean±SD	25.07±2.87	24.17±3.11		90.0%	69	23.24-31.49	
t-test		0.356				25.09±1.99	
P		0.668					

Study group=Patients who receiving Tele-nursing intervention
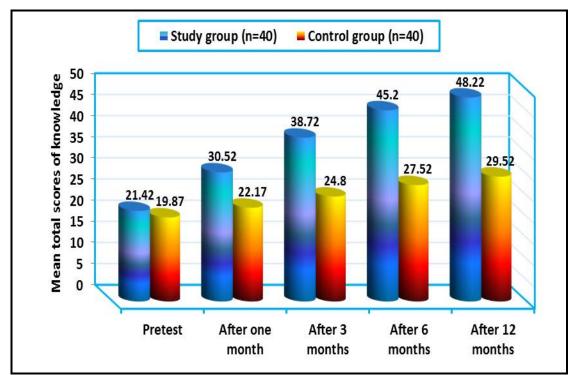*Control group=Patients who didn't receiving Tele-nursing intervention*

Table (2): Medical data of the studied patients with chronic venous leg ulcer (N=80).

Medical data	The studied patients with chronic venous leg ulcer (N=80)						χ^2 P
	Study group (N =40)		Control group (N =40)		Total (N=80)		
	N	%	N	%	N	%	
History of deep vein thrombosis:							
Yes	2	7.5%	2	7.5%	4	5.0%	1.050
No	38	92.5%	38	92.5%	76	95.0%	0.303
History of varicose vein:							
No	40.	100.0%	40.0	100.0%	80	100%	-
Previous injury (fracture):							
Yes	2	5.0%	1	2.5%	3	3.75%	1.011
No	38	95.0%	39.0	97.5%	77	96.25%	0.312
Previous surgery:							
Yes	4	10.0%	5	12.5%	9	11.25%	2.634
No	36	90.0%	35	87.5%	71	88.75%	0.102
Chronic edema:							
Yes	5	12.5%	3	7.5%	8	10.0%	0.556
No	35	92.5%	37	87.5%	72	90.0%	0.456
Presence of comorbidities:							
Diabetes	22	55.0%	19	47.5%	41	51.25%	2.588
Hypertension	18	44.0%	21	52.5%	39	48.25%	0.267
Duration of longest ulcer (months):							
<6	37	92.5%	36	90.0%	73	92.5%	0.157
6-12	3	7.5%	4	10.0%	7	7.5%	0.692
CEAP classification of VLU:							
C1	5	12.5%	9	22.5%	14	17.5%	3.189
C2	18	45.0%	13	32.5%	31	38.75%	0.360
C3	16	40.0%	15	75.0%	31	38.75%	
C4	1	2.5%	3	7.5%	4	5.0%	

Study group *= Patients who receiving Tele-nursing intervention*
Control group *= Patients who didn't receiving Tele-nursing intervention*

Table (3): The mean knowledge scores of the studied patients with chronic venous leg ulcer at different intervals (pre and post intervention one, three, six, 12 months) (N =80).

Total knowledge scores at different times of assessment	Total knowledge scores among the studied patients with chronic venous leg ulcer (N =80)		t-test	P
	Study group (N =40)	Control group (N =40)		
	Range Mean±SD	Range Mean±SD		
Mean knowledge scores at different assessment:				
Pretest	21.42±8.07	19.87±3.10	1.134	0.260
After one month	30.52±5.87	22.17±2.87	8.076	0.0001*
After 3 months	38.72±4.69	24.82±2.92	15.903	0.0001*
After 6 months	45.20±3.27	27.52±2.96	25.350	0.0001*
After 12 months	48.22±2.44	29.52±3.00	30.538	0.0001*
F value **P**	173.693 0.0001*	68.885 0.0001*		

Study group *= Patients who receiving Tele-nursing intervention*
Control group *= Patients who didn't receiving Tele-nursing intervention*
*Statistically significant

Figure (1): Mean total knowledge scores of the studied patients with chronic venous leg ulcer pre and post intervention during follow up (N =80).
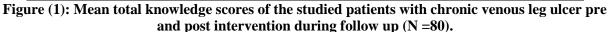
Table (4): Total quality of life (QoL) scores of the studied patients with chronic venous leg ulcer pre and post intervention during follow up and its change after 12 months of follow up than pretest (N =80).

Total QoL scores at different times of assessment	Total QoL scores among the studied patients with chronic venous leg ulcer (N =80)		t-test	P
	Study group (N =40)	**Control group (N =40)**		
	Mean± SD	**Mean± SD**		
Total QoL scores at different assessment:				
Pretest	30.42±1.81	30.30±1.22	0.362	0.718
After one month	31.17±1.66	30.47±1.60	1.918	0.059
After 3 months	31.32±1.65	30.57±1.32	2.242	0.028*
After 6 months	31.85±1.80	30.60±1.32	3.538	0.001*
After 12 months	31.95±1.75	30.70±1.34	3.579	0.001*
F value **P**	195.296 0.0001*	67.006 0.0001*		
Change of total QoL scores after 12 months post than pretest	-1: 5 1.52±1.69	0: 4 0.40±1.06		
Z test **P**	3.300 0.001*			

Study group   = *Patients who receiving Tele-nursing intervention*
Control group = *Patients who didn't receiving Tele-nursing intervention*
*Statistically significant

Table (5): Correlation between total scores of knowledge, quality of life (QoL) of the studied patients with chronic venous leg ulcer pre and post intervention (N =80).

Total scores at different times of assessment	Correlation of total scores among the studied patients with chronic venous leg ulcer (N =80)			
	Study group (N =40)		Control group (N =40)	
	Total knowledge scores		Total knowledge scores	
	R	P	R	P
Pretest Total QoL scores	0.214	0.185	0.155	0.339
After one month Total QoL scores	0.011	0.947	0.269	0.093
After 3 months Total QoL scores	0.379	0.016*	0.449	0.004*
After 6 months Total QoL scores	0.236	0.142	-0.434	0.005*
After 12 months Total QoL scores	0.255	0.113	-0.409	0.009*

Study group= Patients who receiving Tele-nursing intervention
Control group= Patients who didn't receiving Tele-nursing intervention
r=Correlation Coefficient   **Statistically significant*

Table (1): Shows the Sciodemographic characteristics of the studied patients. More than half of studied sample were male (62.5&55%) in study and control group respectively. The mean age of studied sample was (46.73±2.86; 47.74±3.68) in both groups. The majority of participants (85% &90%) were single respectively. About 30.0% of studied sample had primary level of education. There was no significant difference between the two groups in relation to demographic data.

Table (2): Shows the medical data of the studied groups. It was noticed that in total, 68.5% of patients had venous leg ulcer. The majority of participants (95%) didn't have DVT history. All patients had no varicose vein history. The majority of participants (96.25%) weren't previously injured. Seventy-two percent of participants did not have chronic edema. Diabetes was presented in 55.0 % in study group in comparison to the control in which diabetes presented in 47.5 % of patients. Hypertension and DVT presented in 42.5 and 2.5 % in study group and in 47.5 and 5% in the control group respectively. There was no statistically significant difference between the two groups related to the medical data.

Table (3): Clarifies the mean knowledge score at different intervals among studied patients with chronic venous leg ulcer. Pre intervention there was no statistically significant difference in both groups. While post intervention and follow up it was noticed that enhancement in scores in the study group

(48.22±2.44) compared to (29.52±3.00) in the control group (p=0.0001).

Figure (1): Illustrates that improvement of knowledge's scores of the study participants after Tele-nursing implementation than before (from 21.42 to 48.22) with highly statistically significant difference at P value > 0.001 compared to control group from 19.87 to 29.52.

Table (4): Clarifies the total quality of life score during different follow up periods between the two groups. It was demonstrated that there was a highly significant difference in the quality of life score according to the different follow up periods within the group (p=0.0001) in each group separately. Among total patients, there was a significant difference between the two groups after 3, 6 and 12 months follow up (p=0.028, 0.001 and 0.001) respectively. Additionally, the mean change of total QoL scores after 12 months post intervention was increased in the study group (1.52±1.69) compared to (0.40±1.06) in the control group with statistically significant difference (P =0.001).

Table (5): Shows the Correlation between total scores of knowledge and quality of life (QoL) of the studied patients with chronic venous leg ulcer. There was statistically positive correlation between knowledge score and quality of life in study group after 3 months from intervention (P=0.016). But in the control group, there was statistically negative correlation between knowledge score and quality of

life post 6 and 12 months of follow-up (P=0.005 and 0.009) respectively.

Discussion
Telephone follow-up is viewed as a low-cost, easily structured intervention that is effective for sharing data, offering healthcare advices and educating, managing symptoms, identifying complications earlier, assuring patients, and improve quality of care **(Hassan, 2017).**

Regarding to demographic data, the present study clarified that men had more leg ulcers than women did. This finding is in line with **Vanherwegen et al., (2023)**, who claimed that men presented with more severe FU than women. The researcher went on to say that smokers are more likely to develop leg ulcers because smoking causes vasoconstriction that interference with blood supply. Also, males are less attentive to symptoms than women are to them.

The majority of the patients in this study varied in age from forty to fifty-seven years old. This finding was similar to the findings of **Mahmoud et al., (2019)**, who discovered that the majority of their sample was men between the ages of forty to sixty. But this finding disagreed with **Zulec et al., (2019)** , who mentioned that the sample in this study had elderly age, the researcher in the current study explained that the participant had diabetic disease which affect patient 'condition and causes deficiency of blood supply that led to foot ulcer

Regarding to co-morbidities disease as DM; about fifty of the studied sample had diabetes mellitus (DM), which caused foot ulcers. This result was similar to **Sorber et al., (2021),** who mentioned that overall, diabetic foot sores are a common but serious consequence of poorly treated diabetes mellitus, and marginalized populations with major access hurdles to healthcare bear an uneven share of the burden. Also, this finding was in agreement with **Padberg, (2017),** who stated that diabetes is a vigorous aspect in delaying leg ulcer healing; because it leads to deprived circulation beside the reduction of sensation among VLU patients result in delaying wound healing and be susceptible to infection especially uncontrolled diabetic patients.

As regard to knowledge there was an improvement of knowledge's scores among study participants after Tele-nursing implementation at different intervals .this result was consistent with **Oyekanmi, et al., (2020),** who reported that nurse-led education increased diabetic patients' awareness on how to prevent leg ulcers. Diabetes patients' understanding of how to prevent leg ulcers was enhanced by nurse-led education through targeted health education sessions like guiding, counseling, and advising.

Moreover **El-Zayat, et al., (2022),** as the same line with this result who showed that highly statistically significant improvements in all items of knowledge at post Tele-nursing instructions. As well, this study showed highly statistically significant improvements among the studied sample concerning total knowledge scores, the results revealed that more than two thirds had poor knowledge score at pre Tele-nursing instructions, while at post Tele-nursing instructions, the majority of them had good knowledge scores about systemic lupus erythematosus. The researcher clarified that by using Tele-nursing the patient can research any advice or managing about health condition at any time without any hinder and ensure, refresh any previous information that missed

Regarding quality of life, the present study mentioned that the patient with leg ulcer had poor quality of life (all dimension as physical, emotional social) pre Tele-nursing, this result at the same line with **Khunkaew et al. (2019)**, who reported that patients with leg wound ulcers are affected not only physically but patient as a whole. Also, **Falanga et al., (2022)**, who stated that, chronic venous ulcers alter patients' lives in a number of ways because of the pain, mobility issues, exudate, odour, and other factors. Activities of daily life and social interactions may be affected by a patient's mood due to these, which can impact family dynamics and social conviviality.

In relation to quality of life and Tele-nursing; the finding of the current study mentioned that post Tele-nursing intervention, there was improvement in it. This result was the same line with **Setiawan et al. (2020),** it demonstrated how Tele-nursing could enhance patients' quality of life and satisfaction among patients with chronic conditions as patient with leg ulcer. The researcher explained that patients need regular monitoring of their ability to live with the sickness and learn how to adapt their lifestyle quickly and effectively. Nurses can communicate with patients over the phone to learn about their requirements and assist in meeting those needs. This technique can extend patient treatment from hospitals to patients' homes while lowering patients' stress, anxiety, and depression and boosting their self-esteem.

As regards of knowledge and quality of life; the current study stated that there was weak relationship and no statistical significant difference between knowledge and QOL this result is consistent with **Korany, et al., (2022),** who reported that there was no statistical significance relation between total knowledge level and patients' quality of life under study. The researcher also explained that regardless of the amount of information about the disease, there are other aspects of the quality of life that affect and

are affected by the patient, such as the physiological aspect that affects the social aspect and the requirements of life.

Additionally patient in control group had a negative correlation between knowledge and QOL, the researcher in this study clarified that as the leg ulcer is a chronic; the patients get increasingly familiar with the disease's nature over time, but their physical, psychological, and social abilities suffer as a result of their chronic exhaustion and repeated hospital stays for therapy and follow-up. Therefore, the patients' quality of life was irritable.

With education and continuous communication between provider and patient, there is the possibility to reduce anxiety among patients, increase their autonomy, and improve their confidence in self-care management, which can help to decrease hospitalization and wound complications. Research has shown that different tele-nursing platforms have a progressive impact on patients venous leg ulcers disorder **(Hassan, 2017).**Using a Tele-nursing as a long-term approach in combination of education, have been shown to reduce or eliminate the complications of venous leg ulcers. Thus, expanding the methodology to help address complications appear to be practical in this specific population.

Limitation

The study conducted on a long time because of follow up period extended for one year.

Conclusions

The study intervention was successful in decreasing the rate of reoccurrence as intended. The comprehensive education program allowed the patient to review a detailed lesson about their disorder, take a test that challenged their comprehension, and voice their concerns about self-management and quality of life. The follow-up calls enabled patients to feel as if they had their provider with them at all the times during one of the most vulnerable stages of their wound healing.

Recommendation

- Tele-nursing approach should be utilized to facilitate nursing tasks and safely and effectively improve patients' quality of life as a part of routine nursing practice.
- Replication of the study using a large probability sample from a broad geographical area to allow greater generalization of the results.

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