

Knowledge and Practice of Family Caregiver for Clients Using Vacuum Wound Therapy for Infected Limb Surgical Wound

SOHEIR ABO ELFOTOUH, M.Sc.; NAGAT SAID, D.N.Sc. and ENAS HELMY, D.N.Sc.

The Department of Community Health Nursing, Faculty of Nursing, Cairo University, Cairo, Egypt

Abstract

Background: Family caregivers had heavy burden and a lot of great responsibilities toward their clients using vacuum wound therapy.

Aim of Study: To assess knowledge and practice of family caregiver for clients using vacuum wound therapy for infected limb surgical wound.

Material and Methods: Design: A descriptive research design.

Setting: Out patient emergency plastic surgical clinic which affiliated to emergency hospital 185 at Cairo university hospital.

The Study Sample: A convenient sample of 61 family caregivers and their (61) clients used vacuum wound therapy were included in the study from August 2017 to March 2018.

Tool for data collection: One tool "Clients and family caregivers a Structured interview questionnaire" which divided to four parts. Part (I): Demographic characteristics of the family caregivers and clients. Part (II): Medical history of clients and home environment. Part (III): Family caregiver knowledge about vacuum wound therapy part (IV): Family caregiver practice about vacuum wound therapy. The total knowledge and practice scores for questionnaires are 100.

Results: 42.6% of family caregivers age from 20 to less than 30 years and 73.7% of them were male. The result revealed that positive statistically significant relations between total knowledge of family caregivers and their age, $p=0.02$. And education level, $p=0.07$. There was a positive statistical significant total practice and their job, $p=0.08$.

Conclusion: The study concluded that, 51% of them had unsatisfactory total knowledge. Total practice 53% of them had satisfactory score while 47% of them had unsatisfactory score of total practices regarding vacuum wound therapy.

Recommendations: The study recommended before application therapy, knowledge should be developed for family caregiver about definition, uses, benefits and initiation of therapy. Improve practice of family caregiver to manage therapy through demonstration and training on safe handling

of infectious and hazardous waste are critical to prevent cross contamination.

Key Words: Family caregiver client – Injury – Vacuum wound therapy.

Introduction

INJURIES due to trauma result in indirect costs to the individual, family and community. Indirect costs of injury may include family needing to take time off work and pay for accommodation close to the treatment and pay for food. Non-quantifiable costs of injury include emotional trauma, permanent partial or full disability, altered career implications, dramatic changes in future roles in family and society, loss of independent living and the necessity for institutional care [1].

Thousands of people are killed and injured due to accident, every day. Men, women or children walking, biking or riding to school or work, playing in the streets may never return home and would leave behind shattered families and communities [2].

Vacuum wound therapy is also known as sub-atmospheric pressure (SAP), topical negative pressure (TNP), vacuum-assisted closure (V.A.C.), and micro-deformational wound therapy (MDWT), and has greatly impacted the field of wound and surgical care [3]. The devices are classified as either powered or batteries. It was applying continuous or intermittent topical negative pressure to a special dressing positioned in the wound cavity. It is designed to help provide a closed, moist, sterile environment, help remove exudate from the wound, stimulate the growth of healthy granulation tissue and aids wound contraction [4].

Also, it is a method that improves the healing process could greatly decrease the risk of infection,

Correspondence to: Dr. Soheir Abo Elfotouh,
The Department of Community Health Nursing,
Faculty of Nursing, Cairo University, Cairo, Egypt

amputation, and length of hospital stay. is a technology that is currently widely used in wound care and is promoted for use on complex wounds. NPWT involves the application of a wound dressing through application of negative pressure often with any wound and tissue fluid drawn away from the area being collected into a jar. The amount of pressure applied using the therapy can vary and there is no single protocol for use however, pressure being delivered ranges from 75mmHg to 150mmHg with 125mmHg being commonly used [5].

Family caregivers are critical partners in the plan of care for clients with limb injury they are responsible for the physical, emotional and often financial support of another person who is unable to care for him/herself due to illness or injury [6].

Family Caregivers who are employed report missed days, interruptions at work, leaves of absence, and reduced productivity because of their caregiving obligations Low personal and household incomes and limited financial resources can result in increased family caregiver risk for negative outcomes financial concerns cause particular distress for family caregivers during long treatment periods [7].

The nurses with orientation regarding the new technologies in wound management. Using VAC therapy with certain types of wound has many positive outcomes such as enhanced healing and granulation tissue formation; management of highly exuding wounds; reduced dressing changes compared with more conventional dressings; reduced nurse time; reduced costs; and improved quality of life [8].

Subjects and Methods

Aim of the study:

The aim of this study was to assess knowledge and practice of family caregivers for clients using vacuum wound therapy for infected limb surgical wound.

Research question:

To fulfill the aim of this study the following research questions are formulated:

- 1- What is the knowledge of family caregivers for client using vacuum wound therapy for infected limb surgical wound?
- 2- What is the practice of family caregivers for client using vacuum wound therapy for infected limb surgical wound?

Research design:

A descriptive exploratory research design was utilized to achieve the aim of this study.

Setting:

The study was conducted at out patient emergency plastic surgical clinic which affiliated to emergency hospital 185 at Cairo University Hospital, it was established since July 2014 and received patients post trauma. Its classified into two main parts, in patient and out patient clinic. Inpatient include specific specialty as surgery, orthopedic, vascular, urology, burn and cardio thoracic also intensive care units, resuscitation room and operating room. The out patient emergency hospital 185 its inside in Surgical out patient clinic which divided into two unit A& B, each unit provides services as follow plastic surgery at Saturday and Tuesday, vascular surgery at Sunday and Wednesday and general surgery at Monday and Thursday. There are weekly rotations for each unit and shifting was occur. The unit A consist of five rooms, two rooms for dressing one of them use for patient use vacuum wound therapy, one room for sterilization and preparing surgical equipment, one room for examination and one room for nursing staff. Routine working time from 8a.m. to 1p.m. The health team at unit consist of four nurses, one resident doctor, one assistant lecturer and one to two internship physicians. Unit B consist of five rooms, two rooms for dressing one of them use for patient use vacuum wound therapy, one room for sterilization and preparing surgical equipment, one room for examination and one room for nursing staff and one room for training and education medical staff. The health team at unit consist of six nurses, one resident doctor, one assistant lecturer and one to two internship physicians. The two room near social workers office, nursing director office and minor operation room.

Sample:

Convenient sample consists of 61 family caregivers and their (61) clients with upper or lower limb injury using vacuum wound therapy at home and family caregivers at emergency plastic surgical clinic at emergency hospital 185 for follow-up 8 consecutive months of the study. All the family caregivers were voluntarily into study after a careful explanation of the objectives of the study. All family caregivers and their clients was attending 2 days every week at Saturday and Tuesday.

Inclusion criteria:

- 1- Clients who live near Cairo University Hospital in Egypt who suffering from infected limb

surgical wound and using vacuum wound therapy.

2- Family care who willing to participate in this study.

Tools of data collection:

The researcher was used one tool divided to four parts to collect the current data of the study after review of recent literature and related researches. Clients and family caregivers a Structured interview questionnaire:

The tool was used to assess of knowledge and practice of family caregiver for clients using vacuum wound therapy for infected limb surgical wound. It classified into four parts:

Part (I): It was include demographic characteristic of family caregivers and clients:

- Demographic characteristic of family caregivers as age, sex, level of education, occupation, address, family relation, and income
- Demographic characteristic of clients as age, sex, level of education, occupation, address, number of family members and health insurance.

Part (II): It was include medical history of the clients and their environment:

Medical history of the clients related to the wound limb injury as well as presence of chronic disease as hypertension, diabetes mellitus and, kidney disease, also smoking, site of injury, time of injury, application of machine, medications and transportation-home environment of the clients as numbers of room and windows, sources of water. Disposal sewage, lights, heaters and types of floors.

Part (III): It was include written questions to assess family caregiver knowledge. Its multiple choose about identifying apparatus parts, benefits of apparatus, uses of apparatus and sources of information about initiation and disconnection of apparatus.

The total knowledge scores for questionnaires are 100%. Those who scored more than 90% satisfactory considered, Scores between 75% and 90% considered accepted knowledge and scores less than 75% are considered unsatisfactory.

Part (IV): Observational check list, to assess family care giver practice through home visit regarding how to care about vacuum wound apparatus at home such as suddenly disconnected the tubes, get rid from wound discharge collected at the apparatus. Availability of equipment, cleaning procedure and disinfected procedure. The total

practice scores of this sheet are 100%. Those who are scored more than 75% are considered satisfactory. The practice scores are less than 75% are considered unsatisfactory.

Ethical consideration: Primary approval was obtained from the Research and Ethics Committee of Faculty of Nursing, Cairo University. Written informed consent was taken from the participant, after explanatory the nature and purpose of the study. They were informed also that participation in the study was completely voluntary. Additionally, all participants were assured that their anonymity and confidentiality was guaranteed through coding the data. Moreover, participants was informed that the data will not be reused in another research without their permission.

Procedure: Official permission was obtained from hospital/units administrators to conduct the study, names of potential clients who met criteria for possible inclusion was obtained twice weekly from the head nurses of outpatient. Each potential a client and family caregiver are approached individually by the research investigator. At that time, the nature and the purpose of the study as well as the follow-up schedule were explained; in addition to all other ethical considerations mentioned previously. Those who approve to participate in the study was asked to sign the consent form. During initial interview and after the consent has been signed, Socio demographic characteristic, medical history and family care givers knowledge and practice and wound assessment, Check list tool and the investigator were completed during follow-up clinic visit for each a client.

Statistical analysis: Data were statistically described in terms of frequencies (number of cases) and percentages. Comparison between the study groups was done using Chi-square (χ^2) test. Exact test was used instead when the expected frequency is less than 5. *p*-values less than 0.05 was considered statistically significant. All statistical calculations were done using computer program IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA) release 22 for Microsoft Windows.

Results

Table (1) shows that 41.0% of clients aged more than or equal 25 years old while 4.9% aged from 15 to less than 20 years old. 78.7% of the clients was male and 21.3% was female. As regard marital status, 59.0% of clients was single while 1.6% was widow. Regarding education level, 26.2%

of client's had basic education and 1.6% had diploma. As regarding job, 31.1% of them did not worked while 1.6% are employee. Regarding to income, 70.5% of clients had income less than 500 Egyptian pounds while 4.9% their income more than 1500 Egyptian pound. Also 96.7% didn't have enough income while only 3.3% had enough income.

Table (1): Demographic characteristics of clients using vacuum wound therapy for infected limb surgical wound (n=61).

Variables	No.	Percentage
Age:		
Less than 5	4	6.6
5>10	12	19.7
10>15	6	9.8
15>20	3	4.9
20<25	11	18.0
>25	25	41.0
Gender:		
Male	48	78.7
Female	13	21.3
Marital status:		
Single	36	59.0
Married	24	39.4
Widow	1	1.6
Educational level:		
Can't read and write	24	39.3
Read and write	11	18.2
Basic education	16	26.2
Secondary education	6	9.8
University education	3	4.9
Diploma	1	1.6
Job:		
Employee	1	1.6
Profession	1	1.6
Student	14	23.0
House wife	8	13.2
Not working	19	31.1
Hand craft	18	29.5
Income:		
Less than 500	43	70.5
500<1000	5	8.2
1000<1500	10	16.4
1500	3	4.9
Enough income:		
Yes	2	3.3
No	59	96.7

Table (2) indicates that 42.6% family caregivers between aged from 20 to less than 30 years old while 4.9% aged more than or equal 50 years old. In additional 73.7% of the family caregivers was male and 26.3% was female. As regard marital status, the family caregivers were married 70.5% while 29.5% were single. Regarding education level, 45.9% family caregivers can't read and write while 1.6% was university educated. As regard the job of the family caregivers worked as hand craft 60.7% while 3.3% of them did not work. Regarding to income, 36.1% had income less than 500 Egyp-

tian pounds and 6.6% their income from 500 to less than 1000 Egyptian pound. Also 88.5% did not have enough income and only 11.5% had enough income.

Table (2): Demographic characteristics of family caregivers for clients using vacuum wound therapy for infected limb surgical wound (n=61).

Variables	No.	Percentage
Age:		
Less than 20	3	4.9
20>30	26	42.6
30>40	20	32.8
40>50	9	14.8
> 50	3	4.9
Gender:		
Male	45	73.7
Female	16	26.3
Marital status:		
Single	18	29.5
Married	43	70.5
Educational level:		
Can't read and write	28	45.9
Read and write	22	36.1
Basic education	4	6.6
Secondary education	6	9.8
University education	1	1.6
Job:		
Employee	3	4.9
Student	4	6.6
House wife	15	24.5
Not working	2	3.3
Hand craft	37	60.7
Income:		
Less than 500	22	36.1
500<1000	4	6.6
1000<1500	22	36.1
1500	13	21.3
Enough income:		
Yes	7	11.5
No	54	88.5
Total	61	100

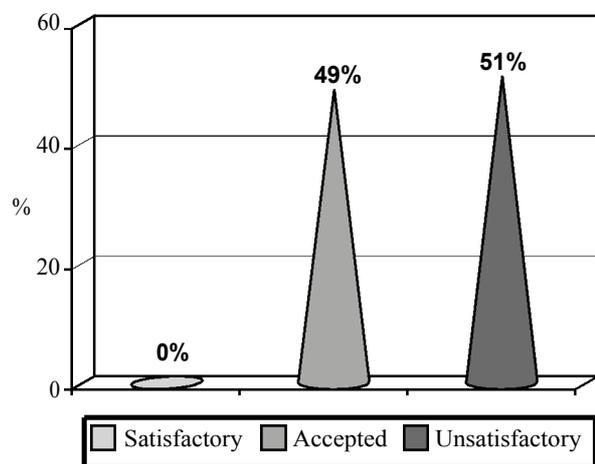


Fig. (1) Total knowledge score of family caregiver.

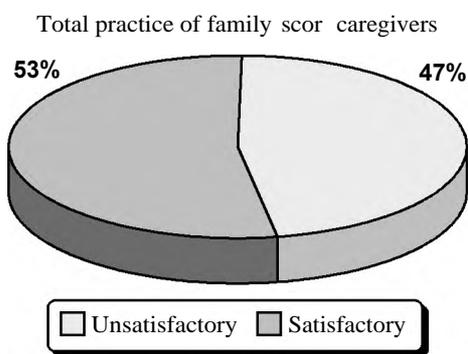


Fig. (2): Total practice of family caregiver

Table (3): Demographic characteristics and home environment of Clients.

Variables	Total knowledge		Total practice	
	χ^2	<i>p</i>	χ^2	<i>p</i>
Age	11.4	0.02*	1.25	0.87
Gender	1.18	0.27	6.5	0.01
Job	5.6	0.33	9.6	0.08*
Income	4.3	0.22	0.91	0.82
Education level	8.4	0.07*	3.8	0.43
Marital status	0.22	0.42	3.8	0.43
Water sources	1.05	0.30	0.92	0.33
Sewage disposal	0.38	0.5	0.25	0.6

Table (3) relation between total knowledge and total practice scores demographic characteristics of family caregivers and home environment, there was positive statistically significant relations between total knowledge of family caregivers and their age, $p=0.02$. There was a positive statistical significant total practice and their job, $p=0.08$. Also there was positive statistically significant relation between total knowledge of family caregivers and their education level, $p=0.07$.

Discussion

Related demographic characteristic of clients, Regarding client's age, the current result showed that less than half of clients aged more than or equal 25 years old. More than three quarters of the clients were male. Also more than third of client's cannot read and write. Regard clients job, the current study indicated that more than third of clients did not work. less than one hundred of clients didn't had insurance. Concerning to family members: The current study show less than one hundred of the clients' family consisted of 3 to less than 6 individuals.

Related demographic characteristic of family caregiver: Related to age, the current result showed that less than half family caregivers between aged from 20 to less than 30 years old and more than

three quarters of family caregivers were male. Concerning family caregiver education level, the study indicated that less than to half family caregivers can't read and write. Also more than half of family caregivers were worked as hand craft.

Medical history of the clients and Home environment: Regarding chronic disease of clients: the current study show that more than three quarter of clients did not had chronic. Regarding injury site: The current study show that almost three quarters of clients had in the leg and more than three quarter of clients applied the machine from 1wk to less than 4wks. Also less than one hundred of clients received medication as antibiotics analgesic and more than half of clients used public transportation.

Knowledge of family caregiver: Its was unsatisfactory, that more than three quarter and more than half related to definition, initiation and discontinuation of vacuum wound therapy. Also less than half of family care giver mentioned benefits.

Practice of family caregivers: Hundred percent of family care were satisfactory in all aspects selected about operating, aid in troubleshooting, remove jar, clears parts of machine practice related to hand washing during cleaned and disinfected the machine: The current study display that less than hundred unsatisfactory practice did not wash their hand and more than three quarter of family caregiver did not wear gloves.

References

- 1- ALFALAH E., ASSABRI A. and KHADER Y.: Pattern of road traffic injuries in Yemen: A hospital-based study. Pan African Medical Journal, 29: 145. doi:10.11604/pamj.2018.29.145.12974. This article is available online at: <http://www.panafrican-med-journal.com/content/article/29/145/full/>, 2018.
- 2- SINGH J., KOUR M.S., BILGUEES S. and KHON S. : Reasons for road traffic accidents victims in India, 2015.
- 3- ALI Z., ANJUM A., MAAJID S. and AHMAD D.: Evaluation of low-cost custom made VAC therapy compared with conventional wound dressings in the treatment of non-healing lower limb ulcers in lower socio-economic group patients of Kashmir valley. Journal of Orthopaedic Surgery and Research, 10: 183 DOI 10.1186/s13018-015-0314-5, 2015.
- 4- FAGERDAHL M.: The Patient's Conceptions of Wound Treatment with Negative Pressure Wound Therapy" health care Healthcare, 2: 272-281, 2014.
- 5- ELTAYEBA H. and KASSEM R.: Negative-pressure wound therapy in pediatric extremity trauma: A single-institution experience <http://www.ejs.eg.net> on Friday, March 15, IP: 154.130.235.236], 2019.

- 6- UPTON D. and ALEXANDER R.: The complexity of caring (Part 1): Detrimental health and well-being outcomes for caregivers of people with chronic wounds, 23 (3), 2015.
- 7- SUSAN M. RHEE M.: Negative Pressure Wound Therapy Technologies for Chronic Wound Care in the Home Setting Technology Assessment Report, in Johns Hopkins University Evidence-based Practice Center, Project ID: WNDT0913, 2015.
- 8- OTHMAN D.: Negative Pressure Wound Therapy Literature Review of Efficacy, Cost Effectiveness, and Impact on Patients' Quality of Life in Chronic Wound Management and Its Implementation in the United Kingdom Plastic Surgery International, doi:10.1155/2012/374398, 2012.

معلومات وممارسات مقدمى الرعاية بالأسرة لمستخدمى جهاز شفط وتفريغ الهواء فى علاج الجروح الملوثة بالأطراف

المقدمة: الإصابات والجروح الناجمة عن الحوادث وخاصة حوادث الطرق تؤدي إلى تكاليف غير مباشرة للفرد والأسرة والمجتمع. وقد تشمل هذه التكاليف الغير مباشرة أن الفرد لا يستطيع الذهاب إلى العمل أو أخذ إجازة من العمل ودفع تكاليف الإقامة على مقربة من العلاج ودفع ثمن العلاج والطعام. وكذلك تؤثر على الناحية النفسية للمريض. كما أن هذه الإصابات تؤدي إلى إعاقة جزئية أو كاملة للفرد وكذلك تؤثر على الفرد والأسرة والمجتمع وكذلك تؤثر على الإنتاج. تتطلب إصابة الأطراف نهجاً متعدد التخصصات مع إشراف الجراح العام وإلتزام من أخصائيين آخرين بما فى ذلك جراحى العظام والأوعية الدموية والتجميلية.

إن إستخدام جهاز شفط وتفريغ الهواء لعلاج الجروح الملوثة بالأطراف يعتبر التقنية المتقدمة والفعالة فى إلتئام الجروح وذلك بإستخدام الضغط السلبي داخل الجرح مما يؤدي إلى سحب السوائل الزائدة وكذلك تقليل حجم التلوث من منطقة الجرح مما يؤدي إلى سرعة نمو الخلايا وشد الأنسجة إلى نقطة مركز الجرح وبالتالي العمل على إغلاق الجرح بشكل سريع وفعال ومن فوائد الجهاز تقليل فترة العلاج للجرح بما فيها فترة الإقامة بالمستشفى وتقليل الحاجة إلى التدخل الجراحى المستمر وكذلك تحقيق أعلى درجات الإلتئام فى وقت قصير من الطرق الاعتيادية.

الهدف من البحث: يهدف هذا البحث إلى تقييم معلومات وممارسات مقدمى الرعاية بالأسرة لمستخدمى جهاز شفط وتفريغ الهواء فى علاج الجروح الملوثة بالأطراف.