

## Assessing knowledge and practice of Caregivers regarding Clients Using Vacuum Wound Therapy

Soheir Abo Elfotouh Ibrahim<sup>(1)</sup> Afaf Salah Abd Elmohse <sup>(2)</sup> Sahar Ahmad Shafik  
<sup>(3)</sup> Mayada Mahmoud Sabea<sup>(4)</sup>

*(M.Sc. in Nursing) Faculty of Nursing Cairo University (1)*

*Professor of Community Health Nursing, Helwan University (2)*

*Professor of Community Health Nursing, El-Fayoum University (3)*

*Assisant. Professor of Community Health Nursing, Helwan University (4)*

**Background:** Vacuum wound therapy is a dressing system that continuously or intermittently applies negative pressure across the surface of wounds that are acute, chronic, complex, or difficult to heal; this type of treatment has become one of the essential elements for the modern and comprehensive treatment of wounds. **Aim:** Assess knowledge and practice of caregivers regarding clients using vacuum wound therapy. **Design:** A descriptive research design was used. **Setting:** The study was conducted at outpatient emergency surgical clinic at Cairo university hospitals Sample: Convenient sample that included all caregivers who have clients with limb traumatic wound using vacuum wound therapy at home (98 client and 98 caregivers). **Tools of data collection:** An interviewing questionnaire sheet consists of five parts: **Part I:** demographic characteristic of caregivers and clients. **Part II:** Past and previous history of the clients Part **III:** Clients home environment reported by caregivers. **Part IV:** caregivers' knowledge vacuum wound therapy and healthy diet. **Part V:** Caregivers reported practice regarding vacuum wound therapy. **Results:** total score Knowledge was 60%, and total reported practice score was 30%., **Conclusion:** there is a highly statistically significant relation between caregivers total knowledge and their demographic characteristics. There is no statistically significant relation between ' total practice and their demographic characteristics. **Recommendation:** there is need for Training Program for Caregivers regarding Clients Using Vacuum Wound Therapy about definition, uses, benefits and initiation of therapy and Improve practice of family caregiver to manage therapy through demonstration and training on safe handling .

**Key word:** assessment, Caregivers knowledge, practice, Vacuum wound therapy.

### Introduction:

Traumatic injuries are the result of a wide variety of blunt, penetrating and burn mechanism. They include motor vehicle collisions, sport injury, falls, natural disasters and a multitude of other physical injuries which can occur at home, on the street, or at work and require immediate care [1].

The prevalence of injuries, 4.4 million injuries related death, unintentional injuries take the lives of 3.14 million people every year. Roughly 1 in 3 of these deaths result from road traffic crashes for adult people age 5- 29 years [2].

High risk traumatic wounds should be treated aggressively to prevent infections and the development of complicated wounds. High risk wounds are those that have an increased incidence of infection due to the type of wound, location, or the patient's underlying medical condition. Those wounds are associated with an increased morbidity, mortality, poorer patient quality of life, and greater costs [3].

Vol. 2, Issue 2, Month: December 2023, Available at: <https://hijnrp.journals.ekb.eg/>

Advanced therapy used for wound management as vacuum wound therapy or Negative pressure wound therapy is commonly called VAC therapy or Vacuum Assisted Closure. The therapy uses negative pressure to promote healing by: maintaining a moist wound healing environment while removing wound fluid that may contain proinflammatory mediators. Optimizing wound perfusion by decreasing periwound edema [4].

The therapy is very fast developing method of the wounds treatment. Using Vacuum wound therapy can be recommended in wide spectrum of clinical indications; this type of treatment has become one of the essential elements for the modern and comprehensive treatment of wounds .The therapy accelerates wound healing in chronic, acute and complex wounds [5].

Caregiving is an important public health issue that affects the daily living for millions of individuals. Family caregivers are required to take on tasks with no warning, no training and no experience. They may feel unprepared and unsure of what to expect or where to turn for help. family caregivers visit outpatient clinic twice / week with client for dressing and carry the machine also he responsible for arrange medical appointment, administering medication, taking care of wounds, , bathing, dressing , transportation from home to outpatient and conferring with doctors and specialists [6].

Nurse educate caregivers to follow stander percussion which important to avoid wound infection and complication. Hand hygiene is one of the most important way of controlling the spread of infection especially when deal with bodily fluid. Nurse advice caregivers to used .Appropriate Personal protective Equipment (PPE), such as household gloves, surgical mask and aprons when handling body fluid. Also regularly clean and disinfection all surfaces of setting and toilet [7].

### Significance of the study

According to statistical of emergency surgical clinic which associated to emergency hospital 185 which affiliated to Cairo University Hospitals that the total numbers of patients with Limb injuries were 4840 patients at 2019 while the number of patients using Vacuum wound therapy were 320 at 2019 (*statistical of Cairo University Hospitals , 2019*)

There is a burden of high cost for renting the vacuum wound therapy from the company(paying 250 Egyptian pound/ day) and caregivers( paying 500 Egyptian pound / home visit) which consider extra financial burden for the clients and their families who are almost suffering from low socioeconomic state and monthly income not enough and save. So training program for caregivers will minimize complications especially infection and minimize financial costs.

Wound care is the nursing duty and nurses are responsible for patients with vacuum wound therapy. Nurses need a particular level of knowledge and skills about how to apply this new modality to ensure optimum wound care Community health nursing play important role for people who require substantial nursing assistance, such as medication administration and wound care. They provide help with activities daily living; for example, bathing and dressing. .Nurses provided care for sick individual and families where they lived, the emphasis of practice.is acute and chronic coordinated and continuous services [7].

### Aim of the study:

The aim of this study was to asses knowledge and practice of family caregivers for clients using vacuum wound therapy

## Subjects and Methods

### 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?
- 2-What is the practice of family caregivers for client using vacuum wound therapy?

### Research design:

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

**Setting:** The study be conducted at outpatient emergency surgical clinic which affiliated to emergency hospital 185 at Cairo university hospitals

### Sampling

A Convenient sample of caregivers 98 who have clients with limb traumatic wound using vacuum wound therapy at home and caregivers at emergency surgical clinic at emergency hospital 185 for follow up six consecutive months

### Tools of data collection:

The following tool used:

**An interviewing questionnaire sheet consists of five parts as the following:**

**Part I:** It was included demographic characteristic of caregivers and clients:

- Demographic characteristic of caregivers such as age, sex, level of education, income, occupation, residence, living with client in home and relation with client.

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

**Part II:** It was included past and previous history of the clients., Medical history of the clients related to the infected limb traumatic wound as well as presence of chronic disease as hypertension, diabetes mellitus and, kidney disease, smoking, site of injury, time of injury, used of vacuum and transportation .

**Part III:** It was included clients home environment, Home environment of the clients as numbers of room and windows, sources of water, sewage disposal, lights, water heater and kind of floor.

**Part IV:** It was included questionnaires to assess caregivers' knowledge: about identifying parts, benefits, uses and sources of information about initiation and disconnection of apparatus. Assess caregivers' knowledge: about nutrition for wound healing: as healthy food, important protein, vitamin A&cand important of zinc.

**Part V:** Practice report , to assess care givers reported practice regarding how to care about vacuum wound therapy at home such as suddenly disconnected the tubes, get rid from wound discharge collected at the jar of machine, cleaning parts of machine and disinfection of machine.



Vol. 2, Issue 2, Month: December 2023, Available at: <https://hijnrp.journals.ekb.eg/>

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

### **Scoring System for Knowledge:**

Knowledge tool consists of 16 questions, the correct and complete answer was given 2 scores; while correct but incomplete scored one; and an incorrect or didn't know was scored zero. Knowledge items' score were summed up and the total divided by the number of the items. These scores were converted into a percent score.

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

### **Reported practice Scoring System :**

The reported practice tools contain 32 questions, the done answer was scored 1, while not done scored 2, the scores of the items were summed up and the total divided by the number of all items giving a mean score. The total scoring of this

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

### **Ethical considerations:**

The informal caregivers were informed about the aim and benefits of this study, and then an oral consent was obtained before starting collection data. Privacy was ensured throughout the study process. The study participants were assured that all data used only for research purposes and there were informed about their rights to refuse or withdraw at any stage with no harmful consequence

### **Validity:**

Content validity of the tools was tested by a jury of five experts in the field of Community Health Nursing to ascertain relevance and completeness; it was done before the pilot study. The content and face validity of the study tools were measured to evaluate the individual items as well as the entire tools used for the study as being relevant and appropriate to test what they wanted to measure. The experts were asked to evaluate individual items on the study tools in relation to their relevance and appropriateness. If the items adequately measure all dimensions of the construct, they give a percent to each. A score of 0.80 or better is generally considered to have good content validity. Face validity of the tools was 96 %

### **Reliability:**

It was conducted to appraise the reliability of the research study tools,

- Informal caregivers' knowledge, Cronbach's Alpha was 0.825.
- Informal caregivers' reported practice, Cronbach's Alpha was 0.835 .

### **Pilot study:**

A pilot study was applied on 10 % (10 caregivers approximately) of the study sample to test clarity, applicability, and comprehensiveness of the study tools, as well as to estimate the time needed for data collection, and those participants were included in the main study sample because no modifications on the tools were required.

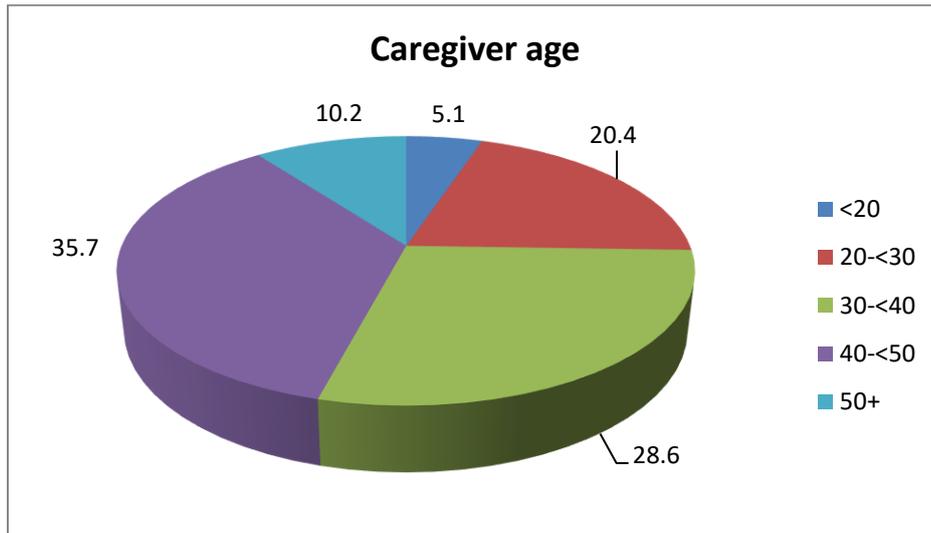
**Results:**

**Part I: Family caregivers and clients demographic characteristics (Tables 1,2)**

**Table (1):** Frequency distribution of family caregivers demographic characteristics (N=98).

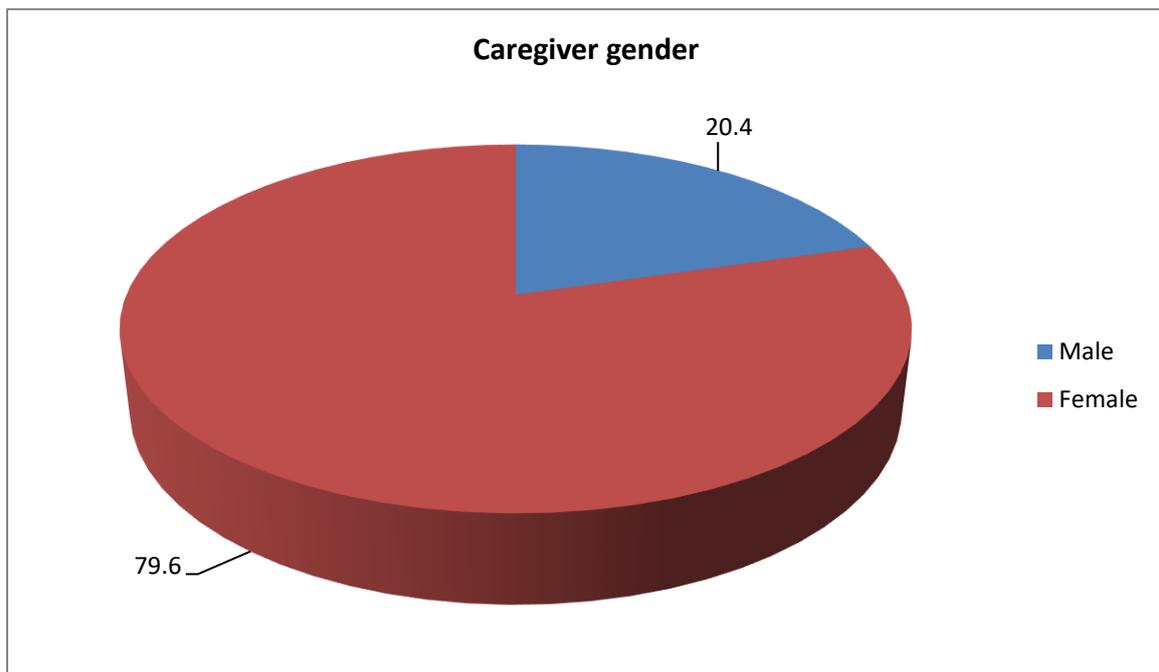
Demographic characteristics	No	%
<b>Marital status</b>		
Single	1	1.0
Married	84	85.7
Widow	5	5.1
Divorced	8	8.2
<b>Occupation</b>		
Employee	40	40.8
Profession	11	11.2
Student	5	5.1
House wife	23	23.5
Hand craft	9	9.1
Not working	10	10.3
<b>Residence</b>		
Rural	50	51.1
Urban	48	48.9
<b>living with client in home</b>		
Yes	95	96.9
No	3	3.1
<b>Relation with client</b>		
Sun	5	5.1
Father	10	10.3
Mothers	20	20.5
Brothers	10	10.3
Other relative	15	15.3

**Table (1)** indicates that 85.7% of caregivers were married while 1.0% were single. Regarding occupation 40.8% of them employee while 5.1% were students. Regarding to place of residence 51.1% of them live in rural area while 48.8 live in urban. 96.9% of caregivers living with client at home while 3.1% didn't live with client. Regarding relation to clients 20.5% the mothers gives care for clients while 5.1% of them their sun.



**Figure (1)** percentage distribution of family caregiver's age (n = 98).

**Figure (1)** indicates that, 35.7 % of them the age between 40<50 years, the mean age  $\pm$  SD were  $37.7 \pm 10.4$  while 5.1% of them were < 20 years.



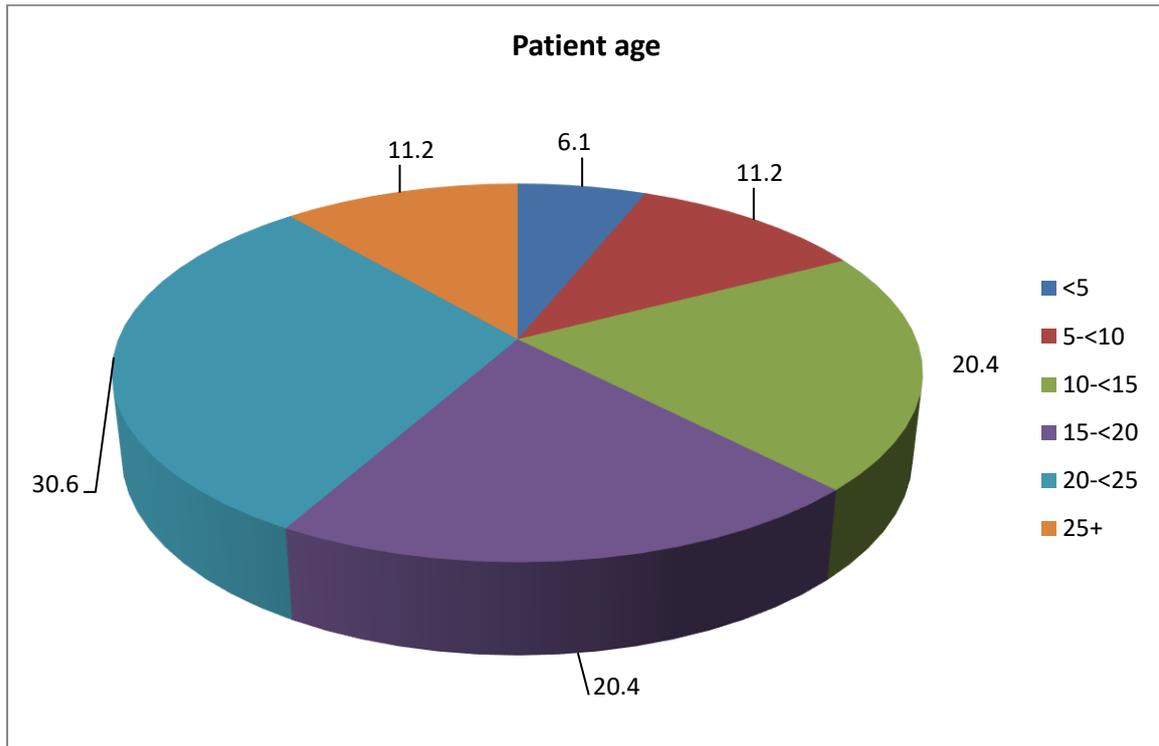
**Figure (2)** percentage distribution of family caregiver's gender (n = 98).

**Figure (2)** Illustrates that 79.5% of them were females.

**Table (2):** Frequency distribution of client demographic characteristics (N=98).

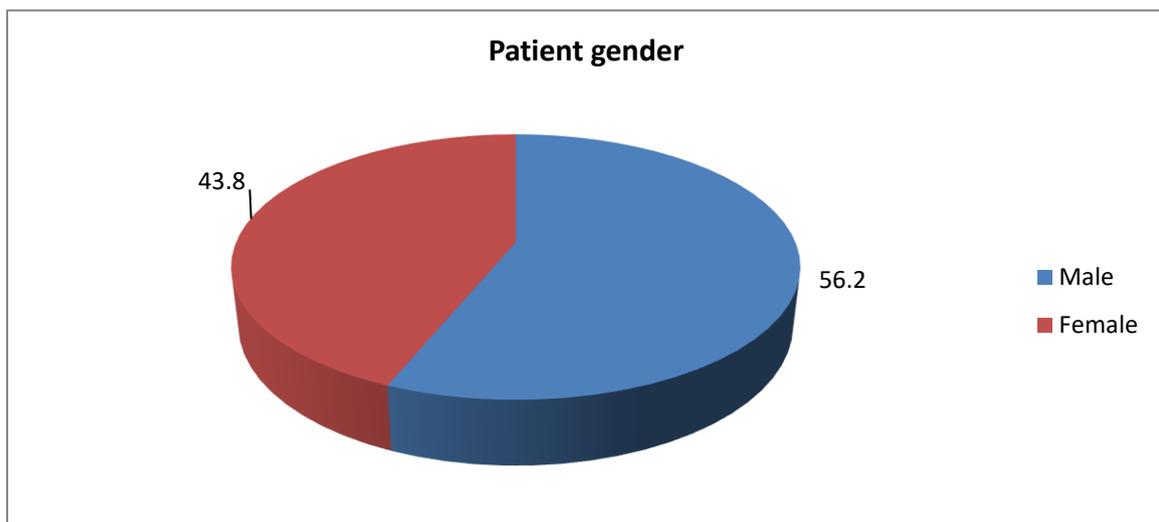
Demographic characteristics	No	%
<b>Level of education</b>		
Not read and write	10	10.2
Read and write	22	22.5
Basic education	30	30.6
Secondary education	18	18.3
Diploma	13	13.2
University or more	5	5.2
<b>Marital status</b>		
Single	2	2.2
Married	83	84.6
Widow	5	5.1
Divorced	8	8.1
<b>Occupation</b>		
Employee	50	51.1
Profession	10	10.2
Student	5	5.1
House wife	10	10.2
Hand craft	20	20.4
Not working	3	3.0
<b>Residence</b>		
Rural	50	51.0
Urban	48	49.0
<b>Monthly income</b>		
Enough	10	10.2
Not enough	83	84.7
Enough and saved	5	5.1
<b>Have health insurance</b>		
Yes	18	18.4
No	80	81.6
<b>Family numbers</b>		
<3	2	2.2
3<6	83	84.6
6<9	5	5.1
>9	8	8.1

**Table (2):** shows that 30.6% of clients were basic education while 5.2% of them were university or more educated. Regarding to marital status 84.6% of them were married while 2.2% of them were single. Regarding occupation, 51.1% of clients were employee while 3.0% of them not worked. Regarding to place of residence 51.0 % of clients live in rural area while 49.0 of them live in urban area. Regarding income, 84.7 % of clients didn't have enough income while 5.1 of them have enough and saved income. Also , 81.6% of them didn't have health insurance while 18.4% of them have health insurance. Regarding the family members, 84.6% of them from 3<6 persons while 2.2% of them <3 persons.



**Figure (3)** percentage distribution of clients age (n = 98).

**Figure (3)** indicates that, 30.6 % of them the age between 20< 25 years, the mean age  $\pm$  SD were  $16.7 \pm 6.8$  while 6.1% of them were< 5 years.



**Figure (4)** percentage distribution of clients gender (n = 98).

**Figure (4)** indicates that 56.2 % of them were males

**Part III: Clients home environment**

**Table (3)** Frequency distribution of clients home environment (N=98).

<b>Home environmental</b>	<b>No</b>	<b>%</b>
<b>Numbers of room</b>		
1 room	30	30.6
2 room	50	51.1
3 rooms or more	18	18.3
<b>Numbers of windows</b>		
1 windows	50	51.1
2 windows or more	48	48.9
<b>Status of windows</b>		
Safe & open	40	40.8
Safe & closed	38	38.8
Broken and not safe	20	20.4
<b>Water source</b>		
Tape	80	81.6
Water pump	10	10.2
Shared tape	5	5.1
Water tank	3	3.1
<b>Good sanitation</b>		
Yes	53	54.1
No	45	45.9
<b>Light in each room</b>		
Yes	55	56.2
No	43	43.8
<b>If yes , what are kind of light (n=55)</b>		
Gasoline bulb	0	0
Light bulb	40	42.2
Window	15	27.2
<b>Water heater</b>		
Available	60	61.2
Not available	38	38.8
<b>Kind of floors</b>		
Tile flooring	60	61.2
Cement floor	20	20.4
Ceramic	15	15.3
Marble	3	3.1

**Table (3):** shows that, the home environmental of the clients, regarding to numbers of room, 51.1% of them were 1 room and 1 window, 40.8% of them were the windows safe & open, Also, 81.6% water source by tape. In relation to good sanitation there were 53% and 55% were light source. Regarding water heater, 61.2% of clients were water heater. Regarding kind of floor, 61.2% of them were tile flooring

**Table (4): Relation between total score of correct knowledge and caregivers demographic characteristic (N=98).**

General characteristic	Total score of correct knowledge			X <sup>2</sup>	P
	Poor %	Average %	Good %		
<b>Age</b>					
<20	70	20	10	*16.538	0.001*
20<30	65	20	15		
30<40	60	30	10		
40<50	70	20	10		
>50	75	15	10		
<b>Gender</b>					
Male	70	20	10	*17.774	0.001*
Female	75	15	10		
<b>Marital status</b>					
Single	60	30	10	*20.882	0.001*
Married	70	20	10		
Divorces	65	20	15		
Widow	50	30	20		
<b>Level of educational</b>					
Not read and write	80	10	10	*21.684	0.001*
Read and write	70	20	10		
Basic education	60	30	10		
Secondary education	50	30	20		
Diploma	70	20	10		
University or more	50	20	30		

**\*\*Highly statistically significant at p < 0.001**

Table (5): Relation between total score of done practice and caregivers general characteristic (No=98)

General characteristic	Total done practice a steps of cleaning disinfection vacuum w therapy		X <sup>2</sup>	P
	no	%		
<b>Age</b>				
<20	20	20.4	*29.354	0.001*
20<30	30	30.6		
30<40	25	25.5		
40<50	30	30.6		
>50	20	20.4		
<b>Gender</b>				
Male	30	30.6	*28.946	0.001*
Female	40	40.8		
<b>Marital status</b>				
Single	30	30.6	*33.347	0.001*
Married	35	35.8		
Divorces	20	20.4		
Widow	25	25.5		
<b>Level of educational</b>				
Not read and write	20	20.4	*24.448	0.001*
Read and write	30	30.6		
Basic education	25	25.5		
Secondary education	30	30.6		
Diploma	20	20.4		
University or more	40	40.8		

\*\*Highly statistically significant at p < 0.001

## Discussion

Vacuum wound therapy is a therapeutic technique, which facilitates the healing of acute and chronic wounds, while preventing the occurrence of infection. It is often used when other treatments have been unsuccessful in chronic wound healing. It is a non-invasive, non-pharmacological wound closure system, which aids healing through the use of localized sub-atmospheric pressure, which is placed on the area. A sealed dressing is placed over the wound and attached to a

Vol. 2, Issue 2, Month: December 2023, Available at: <https://hijnrp.journals.ekb.eg/>

suction pump and drainage tube, which works in removing interstitial fluid and mechanical deformation of the tissue Mohamed et al.( 2020) [9].

**Regarding marital status of caregivers:** The current study revealed that the majority (85.7%) of caregivers were married. This result was supported with Tang et al., (2021)[10] who conducted study entitled "understanding family caregiving for individuals with injury after a road traffic crash" in Taiwan, who mentioned that 75.5% of studied sample were married **As regarding to caregivers gender**, the current study illustrates that more than three quarters(79.5%) of them were females. This study agreement with study done by Kong et al. (2019)[11] in Malaysia about " factors effect on health, work and social activities". who mention that 50.1% of studied sample were females. The researcher point of view, the females provide care and emotional support to their families.

In relation of level education, the present study illustrates that one third (35.7%) of caregiver were diploma. This study matched with study done by Huang et al., (2021) [12] in china "investigation of the status and influence factors of caregiver's life on caring for patients with chronic wound", who found that 33.7% of participant were diploma.

The researcher point of view may be lack of awareness about important of learning and low income and poverty lead to this result.

Regarding caregivers income, the current study illustrates that the majority (81.6%) of caregiver didn't have enough money. This study contradictive with study done by Biliunaite et al. (2020) [13] in Lithuania about "Informal caregiver support needs and burden". Who said that 40.7% of them have enough income. The researcher point of view this difference in result because Egypt were developed country and low standard of living for the individual.

**Regarding demographic characteristics of client:** In relation to level education of clients, the current study denoted that nearly one third (30.6%) of client were basic education. This study conversed with study done by David et al. (2020) [14] in India about " exploring the lived experience of socioeconomic and quality of life outcomes in post-discharge trauma patients" . who mentioned that 57% of participants were high school educated. The researcher point of view this difference may be increase awareness of individuals about education level in India.

In relation to clients age, the current study illustrates that one third(30.6 %) of them the age between 20 < 25 years, the mean age  $\pm$  SD were 16.7  $\pm$  6.8. This study conversed with study done by Mrema & Dida (2020) [15] in Tanzania "A Survey of Road Accident Reporting and Driver's Behavior Awareness Systems" who found that 63% of them aged between 31-40 years. According to references nearly 50% percent of injuries occur in young persons aged 15 to 44years old.

Regarding client gender, the study illustrates that more than half(56.2%) of clients were male. This study matched with the study done by Hassan et al. (2022) [16] "Study of Road Traffic Accidents Cases admitted to Ain Shams University Hospitals during Years 2017 and 2018 about " in Egypt the researcher found that the 87.7% of them were male. The researcher point of view in study result may be due to this may be that males are more seeking to earn money for their social welfares and almost of drivers were males and more exposed to roads and road traffic accident (RTAs) than females

### Regarding relation between the study variables

The current study Showed that statistical significant relation was observed between caregivers general characteristic and total correct knowledge regarding vacuum wound therapy , P = 0.001.this study agreement with study done by

Vol. 2, Issue 2, Month: December 2023, Available at: <https://hijnrp.journals.ekb.eg/>  
Foutouh (2019) [17] in Egypt about " Knowledge and Practice of Family Caregiver for Clients Using Vacuum Wound Therapy for Infected Limb Surgical Wound" who mentioned that relation between total knowledge scores demographic characteristics of family caregivers and home environment, there was positive statistically significant relations between total knowledge of family caregivers and their age,  $p=0.02$ .

Also 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 caregiver's and their education level,  $p=0.07$

The current study Showed that statistical significant relation was observed between caregivers general characteristic and total done practice regarding vacuum wound therapy ,  $P = 0.001$ . This study matched with study done by Foutouh (2019) [17] in Egypt about "assessment of knowledge and practice of family caregivers about use vacuum wound therapy" who reported that relation between total practice scores demographic characteristics of family caregivers,

In additional 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 practice of family caregiver's and their education level,  $p=0.07$  .

#### **Regarding family caregivers knowledge regarding vacuum wound therapy.**

The current study revealed that there were improvement in family caregiver knowledge regarding meaning of vacuum wound therapy as only half(51.1%) of family caregiver knew the meaning of vacuum wound therapy As well as less than half (45.9%)the family caregiver knew the uses of vacuum wound therapy In additional family caregiver mentions the benefit of vacuum wound therapy from one third(35.7%) Also, one third (38.7%) of them knew initiation of device Furthermore, more than third (40.8%) of family caregiver know discontinuation of device

#### **Regarding Caregivers reported practice regarding vacuum wound therapy**

Practice regarding get rid of discharge, the current study mention that the minority (15.4%) of family caregivers get rid of discharge by improper method. This study matched with study done from November 2017 to February 2018 Narayan et al. (2021) [18] in India conduct study about" the knowledge, attitudes, and practices regarding hazardous healthcare waste produced at the household" who reported that The practices regarding hazardous healthcare waste produced at the household level were better among urban households compared with rural households. This significant difference could be because of more coverage of garbage disposal facilities in urban areas than in rural areas.

#### **Conclusion**

**On the light of results of the current Study and answers of the research questions, it could be concluded that:** 60 % of caregivers had unsatisfactory levels of total knowledge regarding vacuum wound therapy. 20% of female health care providers had inadequate level of reported practice. there is a highly statistically significant relation between caregivers total knowledge and their demographic characteristics. There is no statistically significant relation between ' total practice and their demographic characteristics, which highly statistically significant relation . Also, there is positive correlation between total knowledge and total reported practice toward vacuum wound therapy.

## Recommendations

**“On the light of the current study findings the following recommendations are suggested:**

- Applied the study in other site that include all caregivers for generalization.
- Advice for education program, especially caregivers about vacuum wound therapy with other organizations and institutions to improve knowledge and practice.

## References

- 1- **World Health Organization (WHO),(2020):**Management of Limb Injuries During Disasters and Conflicts. <https://www.who.int>.
- 2- **World Health Organization (WHO),(2021):** injuries and violence <https://www.who.int>.
- 3- **Hyes, P., Calamita, R., Tartaglione, C.,(2020):** Negative pressure wound therapy in diabetic foot wound. A systematic review and meta – analysis of observational studies. 2020; 13(6):1260 – 1281
- 4-**Hopkins, J.,(2021):**vacuum Assisted closure of a wound. <https://www.hopkinsmedicine.org>
- 5-**Slatyer, S., Samar, M., Toye, C., (2019):** caregivers' experiences of a home support program after the hospital discharge of an older family member. A qualitative analysis. BMC health services research 19, No 22o (2019).
- 6-**Stanhope, M., Lancaster, J., (2020);** public health nursing population centered health care in the community. <https://www.exlibrsgroup.com>
- 7 **Boga, S., (2019):** Nursing Practices in the Prevention of Post-Operative Wound Infection in Accordance with Evidence-Based Approach. *International Journal of Caring Sciences* 12 (2) -1228
- 8-**Mohamed, E., Eid, A., Hani, Z., Amany, A., (2019):** Effect of training program on performance of nursing care with negative pressure wound therapy
- 9-**Dawson, B.D., & Trapp, R.G. (2001):** Reading the medical literature, basic & clinical biostatistics. Lange Medical Book/ McGraw – Hill. Medical Publication Division, New York, 3rd ed., Ch. 7-9, PP. 161-218 and Ch. 13, PP. 305-314
- 10-**Mohamed, E., Eid, A., Hani, Z., Amany, A., (2019):** Effect of training program on performance of nursing care with negative pressure wound therapy
- 11-**Tang, S., Chi Huang, C., Hui Hu, T., Chi Chou,C., Chu Chiang, M., (2021):** Course and predictors of posttraumatic stress-related symptoms among family to current therapies; 11(7) ,665,htt:// doi. Org/ 10.33.90/11070665  
Tang *et al. Crit Care* (2021) 25:282 <https://doi.org/10.1186/s13054-021-03719-x>



Vol. 2, Issue 2, Month: December 2023, Available at: <https://hijnrp.journals.ekb.eg/>

**12-Huang, Y., Mao, B., Wen Ni, P., Xie, T., Hou, L., (2020)** : Investigation of the status and influence factors of caregiver's quality of life on caring for patients with chronic wound during COVID-19 epidemic. in China,

**13-Biliunaite L , Kazlauskas, A , Sanderman,R.,Andersson, B., (2021)** :Informal caregiver support needs and burden: a survey in Lithuania

**14-David, N., Williamson, A., Macdonald, S., Donnell, C., (2020):** prevention in the 2020: where is primary care. 70(69):376-377. Doi: 10.3399/bjgp20x71180g

**15-Mrema, J., Dida, M., (2020)** : A Survey of Road Accident Reporting and Driver's Behavior Awareness Systems: The Case of Tanzania. Engineering, Technology & Applied Science Research Vol. 10, No. 4, 2020, 6009-6015

**16-Hassan, A., Ahmad, K., El-Menyar, A., Abutaka, A., Mekkodathil, A.,**  
Healing. Adv. Drug Deliv. Rev. **2019**, 146, 97–125. [[CrossRef](#)]

Health and Morbidity Survey 2019.

**17-FOTOUH, S., (2019)** : Knowledge and Practice of Family Caregiver for Clients Using Vacuum Wound Therapy for Infected Limb Surgical Wound