

Assessment of Elderly Caregivers' Knowledge toward Pressure Ulcers at Sohag Governorate Hospitals.

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Abstract

Background: Although 95% of pressure ulcers are preventable, elderly patients who suffer from them have a mortality risk that is two to six times higher than that of a patient whose skin is intact. **Aim:** To assess knowledge of elderly caregivers toward pressure ulcer. **Design:** Descriptive research design. **Setting:** Sohag Governorate Hospitals: Sohag General Hospital and Sohag Teaching Hospital are located in the Western direction, while Akhmim Central Hospital and Sohag University Hospital are located in the Eastern direction. **Sample:** Stratified random sample was used to select two hospitals from each direction, then an appropriate purposive sample used to select the elderly patients and their caregivers during six months. **Tools:** **Tool (1):** Structured interview questionnaire: it includes two parts: **Part I:** Demographic data and medical history of elderly. **Part II:** Demographic data of elderly caregivers. **Tool (2):** Elderly caregivers' knowledge about pressure ulcer structured questionnaire: it includes two parts: **Part I:** Caregivers' knowledge toward pressure ulcer questionnaire. **Part II:** Caregivers' knowledge of pressure ulcer care and prevention structured questionnaire. **Results:** In our study, one third of the elderly caregivers had satisfactory knowledge about pressure ulcers, compared to more than two-third who had unsatisfactory knowledge. **Conclusion:** The knowledge that elderly caregivers possessed about pressure ulcers was inadequate. The level of knowledge about pressure ulcers among the elderly caregivers under study differs significantly from demographic information in a highly statistically significant way. **Recommendation:** Establishing training and educational program about pressure ulcer for elderly people and their caregivers.

Keywords: Elderly caregivers, Knowledge, Pressure ulcers.

Introduction

In the early 20th century, the population pyramids of many nations were triangular in shape. In Egypt, the percentage of the population that is over 60 years old was 10.0% in 2017 and is expected to increase to 20.8% by 2050. By then, roughly 20 million Egyptians will fall into the category of older adults. The need for social and health service plans is critical as the world's aging population is increasing more quickly than in the past. (Awad, et al., 2020).

Aging is defined as a person's progressive physiological changes that result in senescence, or a reduction in biological functions and metabolic stress tolerance. Aging is a personnel gradual or progressive change that raises their risk of illness, death, and debility. This is how the aging process manifests itself in senescence. Age-related changes in the motor function of different body systems are linked to normal aging, and some of these significant motility changes may occur (Cai et al., 2022).

A pressure ulcer (PU) is an injury brought on by prolonged pressure or shearing that affects the skin's surface or the underlying tissue. Long-term pressure applied to a bone prominence can cause tissue ischemia and necrosis. Shear and friction combined with bed rest can damage capillaries and cause local

hypoxia. Prolonged moisture exposure can cause maceration and tissue distraction. Because these injuries typically happen to patients who stay in bed, pressure ulcers (PUs) are also referred to as bedsores, decubitus ulcers, and pressure sores in the international literature (Roussou, et al., 2023).

The elevated incidence of pressure ulcers (PU) could be related to the training and experience that nurses have in risk assessment and prevention techniques. The knowledge, attitudes, and practices of nurses improved the recognition of pressure ulcers; these factors also provided a framework for making informed decisions and for gaining and maintaining the competency required to deliver high-quality nursing care (Ingwu et al., 2019).

The International Guideline advises that as soon as a patient is admitted to the hospital, their PU risk be evaluated straight away using a trustworthy tool. Whenever the patient's condition changes, the risk assessment should be conducted again. However, it should be noted that in addition to the risk assessment, risk factors need to be recognized to initiate interventions in order to mitigate the modifiable risk. If neither assessment was performed, the probability of having PUs increased (Tervo-Heikkinen, et al., 2023).

In order to assist elderly patients, gerontological nurses move and modify beds, check for wrinkles, make sure no bony prominences are compressed, use cushions, pillows, or pressure-relieving assistive devices, move elderly patients using lifting equipment, shift sheets, prevent friction or shear during ambulation, and keep the skin dry after incontinence (Sultana et al., 2022).

Additionally, observe the area by noting any changes in the wound dressing's color, skin redness, foul-smelling wounds, and the presence or absence of pain. Medical personnel may be able to identify fresh wounds as well as ones that are worsening or healing by keeping an eye on them. Older people and those who care for them can benefit greatly from coaching by being advised to switch positions at least every two hours and to maintain a healthy diet and hydration regimen (Sultana et al., 2022).

Adopting a nutrient-dense diet, positioning, using special mattresses, and providing skin care for bedridden clients prior to the onset of bedsores are the main preventive measures. The risk of bed sores must be determined by the medical professionals. It also entails determining the risk prior to the development of bedsores. Primary measures can lessen the incidence (Hartin, 2022).

Significance of the study

Patients admitted to hospitals across various nations have PU rates ranging from 3% to 53%. Compared to developed nations, less developed and underdeveloped nations have higher PU levels. For instance, PU prevalence in German hospitals was reported to be between 2% and 5%, whereas in African nations, the number was as high as 44%. In Iranian hospitals' critical care units, the average prevalence of pressure ulcers was reported to be 19.57% (Amini et al., 2022).

There is a significant difference in the prevalence of pressure ulcers between developed and developing nations, with developed countries having an estimated incidence rate of 25.1% and developing countries having a rate of 31.3% (Fletcher and Hall., 2018). PUs are now a well-known, avoidable patient safety issue on a global scale. It is also among the top five most frequent causes of harm to patients. The cost of treating pressure ulcers is 2.5 times greater than the cost of preventing them (Boyko, et al., 2018).

Elderly patients who are hospitalized frequently worry about pressure ulcers (PUs) in both acute and long-term medical settings. Elderly patients, their families, and caregivers are all greatly impacted. Worldwide, the elderly population over 65 accounts for 70% of pressure ulcer cases. Of these patients, 5-

32% are hospitalized, and 9-22% reside in nursing homes (Awad & Hewi., 2020).

Aim of the study

To assess knowledge of elderly caregivers toward pressure ulcers.

Research questions

- 1- What is the knowledge levels of elderly caregivers towards pressure ulcer?
- 2- Is there relationship between elderly caregivers' level of knowledge about pressure ulcers with demographic data?

Subjects and method

Subject and methods for this study portrayed under the four main items as the following:-

- I. Technical design
- II. Operational design
- III. Administrative design
- IV. Statistical design

I- Technical design

The technical item includes research design, setting, subject and tools for data collection.

Research design

Descriptive research design was used in this study.

Study settings

The study was carried out at the hospitals of the Sohag Governorate, which were split into two sections based on their locations (the Eastern and Western directions). Two hospitals were chosen in each division using a stratified random method. From the governorate's eastern (Sohag University Hospital and Akhmim Central Hospital) and western (Sohag General Hospital and Sohag Teaching Hospital) directions. The hospital's three departments—the orthopedic, internal medicine, and neurological departments—were chosen.

Setting description

Sohag General Hospital is a government public hospital located in the governorate's eastern direction. It's in front of the bus parking area in Sohag's Al-Aref neighborhood. The Sohag Teaching Hospital is situated next to the oncology institute in the western district of Sohag, West Nile Banks. As for Sohag University Hospital, it provides services to both the Western Governorate and the other governorates of Upper Egypt. It is situated in the Sohag governorate's Nasser City. Akhmim Central Hospital is situated next to the Coptic Orthodox Archbishopric on Sohag -

Akhmim - Nasser Agricultural Road. It benefits the residents of Sohag City and Akhmim City.

Every medical specialty is covered by all of these hospitals, along with all medical services. Among them is a very high flow rate for elderly patients. They offer pharmacy services, consultant-driven outpatient clinics, general outpatient services, and inpatient care services. Additionally, they offered medical students instructional services.

Subjects

Inclusion criteria: The elderly patients and their caregivers have the following inclusion criteria:

Inclusion criteria of the elderly:

- 1) The elderly are 60 years and above (male and female relative).
- 2) The elderly are bedridden.
- 3) Elderly willing to participate in the study and able to communicate.

Inclusion criteria of caregivers:

- 1) Caregivers' of elderly patient (male and female relative).
- 2) The participant able to verbally communicate with the interviewer.
- 3) The participant has the time and willingness to participate in the study.

Sample size

The sample size was actually collected from elderly patients and their carers over a period of approximately six months in the previously mentioned setting. There were 200 participants—one caregiver for every elderly patient—who were elderly patients and their caregivers. After receiving approval for research study permission for data collection at the end of December 2022 from the Undersecretary of the Ministry of Health and the President of Sohag University, the study began on January 1st, 2023, and ended at the end of June 2023.

Sample

- 200 elderly patients and their caregivers were selected as a purposive sample. The sample size was calculated using 200 old people and their caregivers and EP Info version 4.5 with a 94% confidence interval.
- According to Steven K. Thompson (2012: 132 patients), the sample was chosen using the following equation:

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times \left(d^2 \div z^2 \right) \right] + p(1-p) \right]}$$

- N= is the total number of patients (200).
- Z = confidence levels equals 0.95 and 1.96
- D = error ratio equals 0.05

- P = property availability ratio, and N = neutral is equal to 0.50

Type of the sample

A stratified random sample used to select two hospitals from each division. Then an appropriate purposive Sample was used to collect the studied sample in selected departments.

Tools for data collection

Tool (1): Structured Interview Questionnaire

Form: It is developed by the researcher and consists of two parts:

Part I: Demographic data and medical history of elderly:

It includes items such as:

- 1- **Demographic data of elderly patients:** such as (age, gender, residence, marital status, occupation, level of education, income).
- 2- **Medical history:** It includes presence of diseases, type of chronic disease, number of chronic disease, complications with diseases, previous hospitalization.

Part II: Demographic data of elderly caregivers:

This section consists of eight items: (Age, gender, marital status, educational status, occupational status, caregiver residence status, elderly living area, relationship between caregiver and elderly patients).

Tool (2): Caregivers' Knowledge toward Pressure Ulcer:

It includes two parts:

Part I: Caregivers' Knowledge toward Pressure Ulcer Questionnaire:

It was developed by the researcher. It was designed to assess caregivers' knowledge of pressure ulcer. It consists of nine items of closed ended question. It included (Definition of pressure ulcers- causes of pressure ulcers - the location of the skin ulcer - stages of pressure ulcer - symptoms- complications- people most vulnerable- treatment- when to seek medical attention).

Scoring system.

Answers in the following categories: "completely correct," "partially correct," and "don't know." If the caregiver makes the right choice, they will receive three degrees; if they make a partially correct choice, they will receive two degrees; and if they make the wrong choice, they will receive one degree.

Part II: Caregivers' Knowledge of Pressure Ulcer Care and Prevention Structured Questionnaire:

It was designed to assess caregiver's knowledge about pressure ulcer. It was developed by (Fathia, Mersal, 2014). The questionnaire included positive and negative items and scores of negative items were reversed. The questionnaire consisted of 18-items such as: Use pillow or cushions to keep bony prominences such as knees and ankles, from direct contact with each other and the overweight patients

should not be given proper balanced diet as it will increase their weight, etc.

Scoring system

Types of responses, from "incorrect" to "correct" to "partially correct." If the caregiver makes the right choice, they receive three degrees; if they make the partially correct choice, they receive two degrees; and if they make the incorrect choice, they receive one degree. The criterion was categorized into two groups: unsatisfactory knowledge level (< 60%) and satisfactory knowledge level (>60%). The total score of the questionnaire was full degrees which represent 100%.

II. Operational design

The operational design included preparatory phase, content validity of the modified tool and reliability, pilot study and fieldwork.

Preparatory phase

In order to create instruments for data collection, it involved analyzing relevant literature and theoretical understanding of several facets of the most current study through the use of books, articles, the internet, periodicals, and magazines. The tools were created in their preliminary form based on this review, and they were examined for face and content validation by a panel of professors who specialize in nursing.

Pilot study

Prior to beginning data collection on ten percent of the elderly caregivers (20 participants) in the chosen setting, a pilot study was conducted to assess the tools' applicability, feasibility, and clarity as well as to estimate the required amount of time. Analysis was done on the pilot study's data. Participants in the pilot study were included in the final analysis since no changes were made.

Validity of tools

These tools were translated into Arabic, and after that, they were developed and given to five Assuit University experts in gerontological nursing for evaluation of their content validity. Any necessary adjustments were made. Each member was contacted and asked to check the completeness and clarity of the items questioned by reviewing the tool's content and structural design. Every critique and recommendation was taken into account, revised, and the order of some statements was followed appropriately.

Reliability of tools

Cronbach's Alpha was used to measure of the internal consistency of a test or scale; it was

expressed as a number between 0 and 1. Internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test. The researcher measures the internal consistency for tools used and it was (Cronbach's Alpha = 0.789 for knowledge).

Field of work

The period of data collection was six months, starting in January 2023 and ending at the end of June 2023. The researcher gathered information for three hours, two days a week, between 10 a.m. and 1 p.m. Depending on the patient's cooperation and time, it took 15 to 20 minutes to complete the questionnaire. In order to gather the necessary data, the researcher visited with elderly patients in the designated departments' waiting areas. The researcher coordinated with each elderly to determine the best time to collect data. The researcher evaluates the medical history of elderly patients with pressure ulcers and the level of knowledge possessed by elderly caregivers. Every day, the researcher saw roughly four patients.

Ethical considerations

The ethical committee of Sohag University's faculty of nursing approved the research proposal. The study subjects' continued use of the research was not at risk. The study adhered to standard ethical guidelines for clinical research. After describing the nature and goal of the study, elderly patients with pressure ulcers and the caregivers who are willing to participate gave their informal consent. Study participants were given the assurance that no research data would be used again without additional consent. Anonymity and confidentiality were guaranteed. Participants in the study were free to decline to participate or to leave at any time without giving a reason.

III- Administrative phase

After explanation of the study aim, an official permission was obtained from the Dean of Faculty of Nursing at Sohag University and the general managers of Sohag governorate hospitals asking for cooperation and permission to conduct the study.

IV- Statistical analysis

Data entry and data analysis were done using Excel 2016 program and SPSS version 22 (Statistical Package for Social Science) respectively. The statistical analysis was done using appropriate statistical methods. I.e. percentage, range, arithmetic mean (X), standard deviation (SD), F test to compare mean of study variables, and Chi square test. Data

were analyzed using the Statistical Package for Social Sciences (SPSS) windows version 16. A P value of 0.05 or less was considered as statistically significant. Graphics were done for data visualization and using Microsoft Excel.

Results

Table (1): Shows that of the older patients studied, 49.5% were between the ages of 60 and 70, and 37.0% were between the ages of 70 and 80, with a mean \pm SD (range) of 71.35 ± 6.59 (60-88). In terms of gender, 57.5% of the elderly participants in the study were men and 42.5% were women. In terms of the elderly people under study, 76.5% of them were found to be married, and 20.5% to be widowed. Regarding the educational attainment of the elderly patients under study, it was discovered that 37.5% of them were proficient readers and writers.

Table (2): Explains that 91.5% of the elderly patients studied have chronic diseases, with high blood pressure, diabetes, and kidney disease ranking highest at 62.3%, 35.5%, and 21.3%, respectively. In contrast, only 8.5% of the elderly patients studied have no chronic diseases, and 87.5% had never experienced a pressure ulcer.

Figure (1): According to this figure, 93.5% of the elderly patients who were studied currently have pressure ulcers, whereas only 6.5% do not.

Figure (2): The elderly patients' pressure ulcer symptoms are depicted in this figure. It is found that gangrene is the least common symptom, occurring in 5.5% of cases, while redness, insensitivity, and pain represent the most common symptoms, accounting for 73.5%, 43.0%, and 41.0% of cases, respectively.

Table (3): A highly statistical correlation has been observed between the elderly patients under study who had previously experienced pressure ulcers and demographic factors like age, place of residence, gender, educational attainment, and income source with p. value ($<0.001^{**}$, 0.003^{**} , 0.001^{**} , 0.009^{**} and $<0.001^{**}$) respectively. This table represents that the age of the studied elderly, there is 52.4% of the studied elderly is from 60-70 years have pressure ulcer. Additionally, 50.3% of the studied elderly is live in urban areas have pressure ulcer.

Table (4): A strong statistical correlation has been observed between the medical history of the elderly patients under study, including the presence of chronic diseases, their functional status, and the length of their hospital stay, and their prior exposure

to pressure ulcers with p. value ($<0.001^{**}$, $<0.001^{**}$ and $<0.001^{**}$) respectively. Furthermore, a statistically significant relationship was found between the elderly patients under study and their medical history, including any history of pressure ulcer complications and their mobility (p. value of 0.020^{*} and 0.010^{*} , respectively).

Table (5): This table shows that, with a mean \pm SD (range) of 30.50 ± 2.26 , 63.0% of the elderly caregivers studied were between the ages of 25 and 35. When it comes to the employment status of elderly caregivers, 35.5% of participants are housewives, and 11.0% are farmers. Furthermore, 77.0% of the senior caregivers in the study are married.

Table (6): This table illustrates the distribution of elderly caregivers' level of knowledge regarding pressure ulcers. It shows that, when it comes to the definition of pressure ulcers and when to seek medical attention, 76.5% and 83.5% of the studied elderly caregivers' answers are partially correct, respectively, while, when it comes to the stages of a pressure ulcer and its complications, 39.5% and 35.5% of the studied elderly caregivers' answers don't know.

Table (7): It is observed that 37.5% of the elderly caregivers in the study held the false belief that a bedridden patient should be gently pulled to a different position. Furthermore, 36.5% of them thought it was false to advise massage for reddened body parts in bedridden patients. However, 71.5% and 69.0%, respectively, believe that it is partially incorrect to turn or reposition patients in bed at least every two hours and that repositioning is not necessary when a special mattress is applied to a bed-ridden patient.

Figure (3): It shows that 29.0% of the elderly caregivers in the study had a satisfactory level of knowledge about pressure ulcers, while 71.0% had inadequate knowledge.

Table (8): This table reveals that there are highly statistical significant differences between the studied elderly caregivers' level of knowledge about pressure ulcers with demographic data such as employment status, the educational level, the state of caregiver living with elderly and relationship of caregiver and the elderly with p. value ($<0.001^{**}$, $<0.001^{**}$, 0.002^{**} and 0.037^{*}) respectively.

Results

Table (1): Distribution of the studied elderly demographic characteristics, (N=200)

Elderly demographic characteristics	No	%
Age groups		
60-70 years	99	49.5
71-80 years	74	37.0
More than 80 years	27	13.5
Mean \pm SD(range)	71.35\pm6.59(60-88)	
Residence		
Urban	106	53.0
Rural	94	47.0
Gender		
Male	115	57.5
Female	85	42.5
Marital status		
Single	1	0.5
Married	153	76.5
Divorced	5	2.5
Widower	41	20.5
Educational level		
Illiterate	58	29.0
Reads and writes	75	37.5
Basic education	35	17.5
Secondary education	3	1.5
University education or more	29	14.5
Relative living with elderly		
Partner (wife or husband)	75	37.5
Sons	123	61.5
Alone	1	0.5
With a relative	1	0.5

Table (2): Distribution of the studied elderly patients according medical history, (N=200).

Medical history	No	%
Presence of chronic diseases		
Yes	183	91.5
No	17	8.5
If yes #		
Diabetes	65	35.5
High blood pressure	114	62.3
Vascular diseases	14	7.7
Respiratory diseases	31	16.9
Digestive systemic diseases	24	13.1
Kidney disease	39	21.3
Orthopedic and neurology	33	18.0
Other *	5	2.7
Presence of complications from the disease		
Yes	56	28.0
No	144	72.0
Patient's ability to move		
Yes	65	32.5
No	135	67.5
The patient's functional condition		
Able to carry out life activities of daily living on his own	27	13.5
Need help to do activities of daily living	129	64.5
Totally unable to do activities of daily living	44	22.0
Duration of stay in the hospital		
(4 – 5) day	18	9.0
(6 – 10) day	83	41.5
(11 – 15) day	75	37.5
More than 15 days	24	12.0
Previous exposure to pressure ulcer		
Yes	25	12.5
No	175	87.5

More than one answer.

* Any chronic disease than mentioned

Figure (1): Distribution of the studied elderly patients according to the presence of pressure ulcer, (N=200).

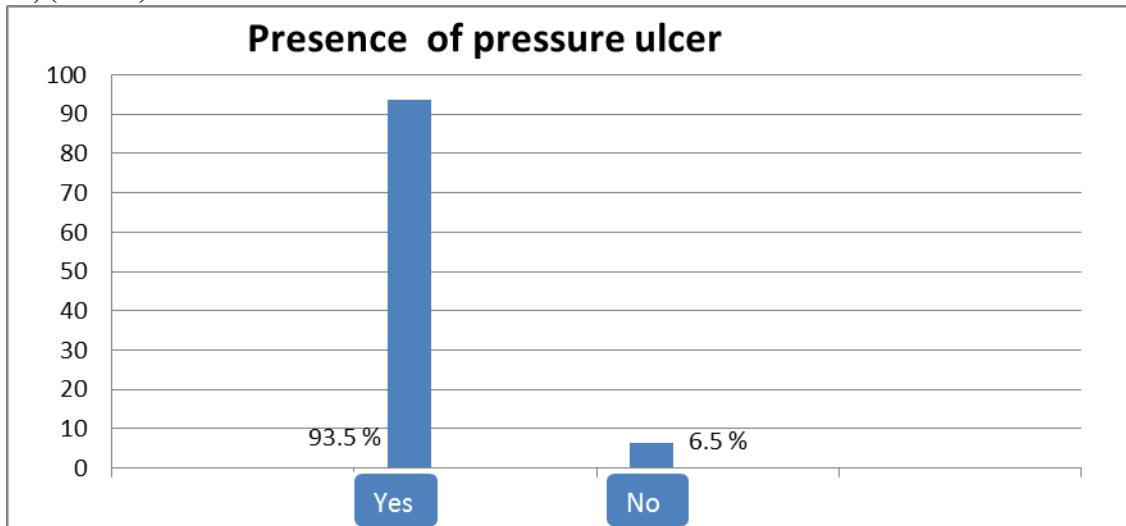


Figure (2): Distribution of the studied elderly patient's symptoms of pressure ulcer, (N=200).

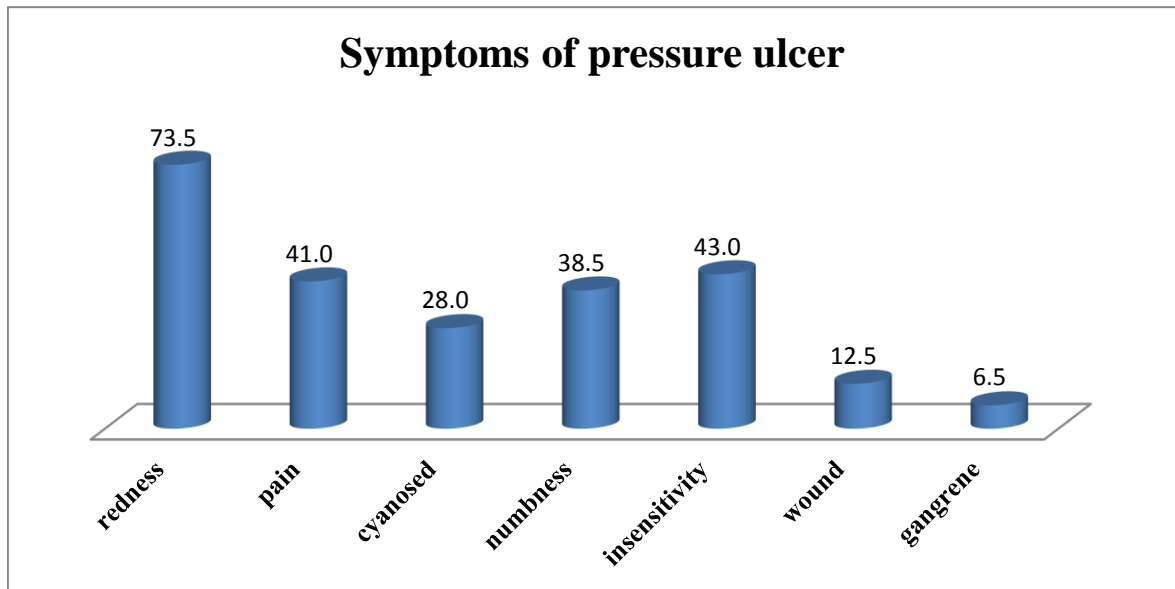


Table (3): Relationship between the studied elderly patients presence of pressure ulcer and demographic characteristics, (N=200).

Demographic characteristics of studied elderly.	Presence of pressure ulcer				X2	P. value
	Yes		No			
	No	%	No	%		
Age group						
From 60-70 years	98	52.4	1	7.7	18.28	<0.001**
From 70-80 years	62	33.2	12	92.3		
More than 80 years	27	14.4	0	0.0		
Residence						
Urban	94	50.3	12	92.3	8.62	0.003**
Rural	93	49.7	1	7.7		
Gender						
Male	102	54.5	13	100.0	10.28	0.001**
Female	85	45.5	0	0.0		
Marital status						
Single	1	0.5	0	0.0	1.98	0.576
Married	141	75.4	12	92.3		
Divorced	5	2.7	0	0.0		
Widow	40	21.4	1	7.7		
Educational level						
Illiterate	57	30.5	1	7.7	13.49	0.009**
Reads and writes	64	34.2	11	84.6		
Basic education	35	18.7	0	0.0		
Secondary education	3	1.6	0	0.0		
University education or more	28	15.0	1	7.7		
Who do you live with						
wife or husband	74	39.6	1	7.7	5.58	0.134
Children	111	59.4	12	92.3		
Alone	1	0.5	0	0.0		
with a relative	1	0.5	0	0.0		
Source of income						
Ministry of Social Solidarity	40	21.4	1	7.7	18.96	<0.001**
Pension after work	61	32.6	12	92.3		
Private property	86	46.0	0	0.0		

*Significant level at P value < 0.05

**Significant level at P value < 0.01

Chi square test for qualitative data between the two variables.

Table (4): Relationship between the studied elderly patients presence of pressure ulcer and medical history, (N=200).

Medical history of the studied elderly.	Presence of pressure ulcer				X2	P. value
	Yes		No			
	No	%	No	%		
Presence of chronic disease						
Yes	181	96.8	2	15.4	103.57	<0.001**
No	6	3.2	11	84.6		
Presence of complications						
Yes	56	29.9	0	0.0	5.41	0.020*
No	131	70.1	13	100.0		
Is the patient able to move or not?						
Yes	122	65.2	13	100.0	6.69	0.010*
No	65	34.8	0	0.0		
The patient's functional condition						
Able to carry out activities of daily living on his own	16	8.6	11	84.6	60.35	<0.001**
Need help to do activities of daily living	127	67.9	2	15.4		
Totally unable to do activities of daily living	44	23.5	0	0.0		
Duration of hospitalization						
(4 – 5) day	7	3.7	11	84.6	97.12	<0.001**
(6 – 10) day	82	43.9	1	7.7		
(11 – 15) day	74	39.6	1	7.7		
more than 15 days	24	12.8	0	0.0		
Ulcer degree:						
First degree	93	49.7	1	100.0	1.01	0.995
Second degree	41	21.9	0	0.0		
Third degree	22	11.8	0	0.0		
Fourth degree	2	1.1	0	0.0		
First & second degree	21	11.2	0	0.0		
First degree & third degree	2	1.1	0	0.0		
Second & third degree	2	1.1	0	0.0		
Third & fourth degree	4	2.1	0	0.0		

*Significant level at P value < 0.05,**Significant level at P value < 0.01

Chi square test for qualitative data between the two variables.

Table (5): Distribution of the studied elderly caregivers' demographic characteristics, (N=200).

Elderly caregivers demographic characteristics		No	%
Age caregivers			
18-25 year		37	18.5
26-35 year		126	63.0
More than 35 year		37	18.5
Mean ± SD(range)		30.50±2.26(18-46)	
Residence			
Urban		95	47.5
Rural		105	52.5
Gender			
Male		102	51.0
Female		98	49.0
Occupation status			
Housewife		71	35.5
Farmer		22	11.0
Worker		41	20.5
Businessman		54	27.0
Student		12	6.0
Marital status			
Single		41	20.5
Married		154	77.0
Divorced/widow		5	2.5
The educational level			
Illiterate		15	7.5
Reads and writes		34	17.0
Basic education		104	52.0
Secondary education		6	3.0
University education and more		41	20.5
The state of caregiver living with elderly			
Lives together with the elderly patient		174	87.0
Lives separately from the elderly patient		26	13.0
The relationship of the caregiver and the elderly			
First degree		125	62.5
Second degree		73	36.5
Other #		2	1.0

Third or fourth degree

Table (6): Distribution of the studied elderly caregivers' level of knowledge about pressure ulcers, (N=200).

Knowledge about pressure ulcer	don't know		Partially Correct		Complete Correct	
	No	%	No	%	No	%
Definition of pressure ulcers	1	0.5	153	76.5	46	23.0
Causes of pressure ulcers	0	0.0	198	99.0	2	1.0
The location of the skin ulcer	0	0.0	195	97.5	5	2.5
Stages of pressure ulcer	79	39.5	101	50.5	20	10.0
Symptoms of pressure ulcer	14	7.0	185	92.5	1	0.5
Complications of pressure ulcer	71	35.5	129	64.5	0	0.0
People most vulnerable	1	0.5	187	93.5	12	6.0
Pressure ulcer treatment	8	4.0	192	96.0	0	0.0
When to seek medical attention?	31	15.5	167	83.5	2	1.0

Table (7): Distribution of the studied elderly caregivers' level of knowledge about care of pressure ulcer, (N=200).

Knowledge about care of PU	Incorrect		Partially correct		Correct	
	No	%	No	%	No	%
The patient on a wheel chair should shift their weight approximately every 15 minutes	58	29.0	136	68.0	6	3.0
Turn or reposition patients in bed at least every 2 hours.	45	22.5	143	71.5	12	6.0
When you are assisting a patient with changing position, move the patient carefully	41	20.5	135	67.5	24	12.0
Use of proper transfer techniques can reduce friction of the skin while transferring.	48	24.0	126	63.0	26	13.0
The patient should ensure maximum mobility according to their capabilities.	37	18.5	129	64.5	34	17.0
Avoid applying any lotion to bony prominences or reddened areas, as this may soften or irritate the skin increasing breakdown	46	23.0	135	67.5	19	9.5
The most risky areas to pressure ulcer development such as upper back, should be checked every day.	41	20.5	130	65.0	29	14.5
Avoid overstretching of skin while the patient is repositioned or transferred	51	25.5	125	62.5	24	12.0
Use pillow or cushions to keep bony prominences such as knees and ankles, from direct contact with each other.	47	23.5	125	62.5	28	14.0
Assess weight changes of the patient over time.	50	25.0	131	65.5	19	9.5
Ensure that the patient is well-nourished.	38	19.0	132	66.0	30	15.0
Usually drinking 8 glasses of water everyday will be sufficient.	36	18.0	124	62.0	40	20.0
Repositioning is not necessary to be performed on a bed ridden patient when a special mattress is applied.	53	26.5	138	69.0	9	4.5
To prevent pressure ulcer, a bedridden patient should be dragged slowly for changing the position	75	37.5	113	56.5	12	6.0
While dressing the wound of the patient, hand washing is not necessary if the gloves are worn.	86	43.0	102	51.0	12	6.0
Massage is recommended for reddened body areas in bed ridden patients	73	36.5	107	53.5	20	10.0
The patient on wheel chair has lesser chance of developing pressure ulcer.	65	32.5	114	57.0	21	10.5
The overweight patients should not be given proper balanced diet	60	30.0	130	65.0	10	5.0

Figure (3): Percentage distribution of the studied elderly caregivers' total score of knowledge.

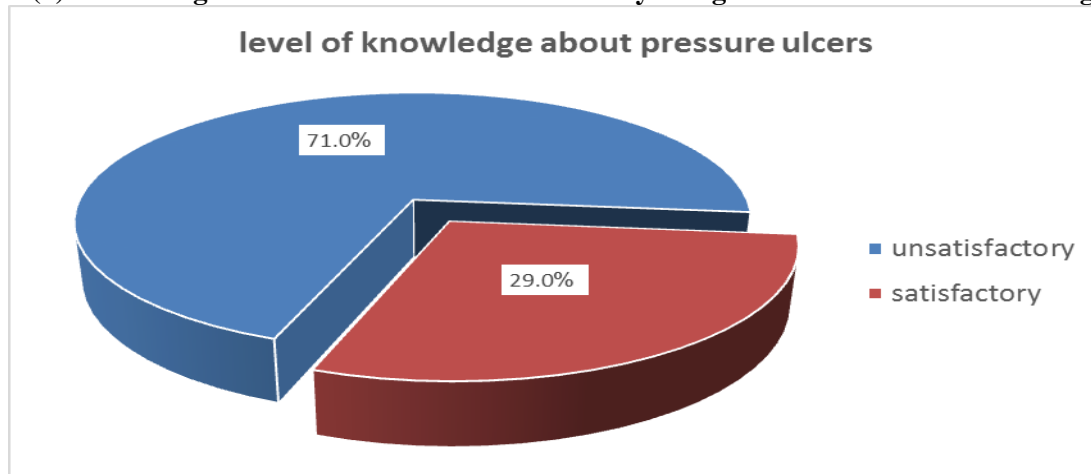


Table (8): Relationship between the studied elderly caregivers' level of knowledge about pressure ulcers with demographic data, (N=200).

Elderly caregivers' demographic data	level of knowledge about pressure ulcers				X2	P. value
	Unsatisfactory (n=142)		Satisfactory (n=58)			
	No	%	No	%		
Age caregivers						
Less than 25 year	28	19.7	9	15.5	3.37	0.186
From 25-35 year	84	59.2	42	72.4		
More than 35 year	30	21.1	7	12.1		
Residence						
Urban	64	45.1	31	53.4	1.16	0.282
Rural	78	54.9	27	46.6		
Gender						
Male	73	51.4	29	50.0	0.03	0.857
Female	69	48.6	29	50.0		
Occupational status						
Housewife	61	43.0	10	17.2	65.78	<0.001**
Farmer	21	14.8	1	1.7		
Worker	9	6.3	32	55.2		
Businessman	44	31.0	10	17.2		
Student	7	4.9	5	8.6		
Marital status						
Single	28	19.7	13	22.4	0.53	0.768
Married	111	78.2	43	74.1		
divorced/widow	3	2.1	2	3.4		
The educational level						
Illiterate	15	10.6	0	0.0	79.08	<0.001**
Reads and writes	33	23.2	1	1.7		
Basic education	84	59.2	20	34.5		
Secondary education	2	1.4	4	6.9		
University education and more	8	5.6	33	56.9		
The state of caregiver living with elderly						
Lives together with the patient	117	82.4	57	98.3	9.18	0.002**
Lives separately from the patient	25	17.6	1	1.7		
The relationship of the caregiver and the elderly						
First degree	81	57.0	44	75.9	6.57	0.037*
Second degree	59	41.5	14	24.1		
Other #	2	1.4	0	0.0		

Third or fourth degree

Discussion

Despite its terrible consequences, 95% of pressure ulcers are avoidable. Patients who have a pressure ulcer have a mortality risk that is two to six times higher than that of patients whose skin is intact. These days, the development of a pressure ulcer in a patient is a sign of subpar medical care and lowers the patient's quality of life. While all medical personnel have a duty to avoid pressure ulcers, nurses are primarily responsible for providing front-line care, and preventing pressure ulcers needs the knowledge and

skills of nurses working in hospitals (Tesfa Mengist, et al., 2022). Since caregivers help with personal care, feeding, repositioning, skin hydration, and other inherent care activities, the adoption of preventative measures related to pressure ulcers highlighted the significance of caregiver behaviors, attitudes, and knowledge (Matos et al., 2023).

The current study's findings regarding the age range of the elderly subjects under investigation indicated that they ranged from 60 to 88 years of age. About half of the elderly were found to be in the 60–70 age

range. The researcher point of view that high prevalence of pressure ulcer was among elderly people as, they were bedridden and had many chronic diseases. These results were in agreement with **Razi-Chafi et al., 2023** who studied prevalence of pressure ulcer and its related factors in elderly patients hospitalized to teaching hospitals in East Guilan. They found that the patients' calculated mean age was 69.54 ± 9.33 years. Also, agreed with **Corbett et al., 2017** who studied pressure injury in a community population in New England, Revealed that roughly less than three-quarters of the study's older individuals with PUs who were living at home.

Additionally, another study in the United States of **Bogaisky et al., 2015** who studied early hospital readmission of nursing home residents and community-dwelling elderly adults discharged from the geriatrics service of an urban teaching hospital. They saw a correlation between PU and a higher proportion of senior citizens residing at home as well as readmissions to hospitals. The current study's results on the gender of the elderly subjects revealed that over half of them were men. These results were in agreement with **Ibrahiem&Abd El-Maksoud., 2021** who studied training program for caregivers to prevent pressure ulcers among elderly residents at geriatric homes Helwan district, They discovered that males made up more than half of the elderly patients under study. Also, **Razi-Chafi et al., 2023** revealed that nearly two-thirds of the cases were males. Conversely, though, the study of **Ramos et al., 2022** who studied burden of informal caregivers of patients with pressure ulcers in a primary care setting. Who discovered that women made up more than two thirds of the elderly.

The current study findings regarding the educational status of the elderly subjects revealed that over one-third could read and write, while less than one-third could not. From the researcher point of view, this was may be due to Egyptian culture of elderly of non educated people. This was confirmed with **Lee et al., 2022** who studied impact of pressure ulcer prevention knowledge and attitude on the care performance of long-term care facility care workers in South Korea and revealed that over two thirds of the elderly people under study had only completed elementary school or less.

Regarding the relatives who lived with the elderly, it was found that over one-third were partners (wife or husband), and over half were the elderly's sons. From the researcher point of view, this was may be due to son was the first person was responsible for caring for his parents. This was in agreement with **Artico et al., 2018** who studied prevalence, incidence and associated factors of pressure ulcers in an Italian home palliative care patient. A single caregiver, primarily the spouse more than half and female more than three-

quarters, provided care for over two-thirds of the patients at home.

This study found that the great majority of the elderly patients under investigation had chronic diseases. With the highest rank of diabetes and hypertension. These results were confirmed by **Nadukkandiyl et al., 2020** who studied implementation of pressure ulcer prevention and management in elderly patients they reported that Anemia, diabetes mellitus, and hypertension were the most prevalent co-morbidities. Besides, **Mobayenet al., 2022** who studied hospital-acquired pressure ulcers in trauma patients in the North of Iran. They reported that a study demonstrated a clear link between PU and hypertension.

Based on the length of hospital stay of the studied elderly patients, this study revealed that more than two-fifths of the patients were hospitalized for six to ten days. According to the researcher, a prolonged stay in bed causes the patient's tissues to remain compressed and immobile, increasing the risk of pressure ulcers. These results were contributed with **Zarei et al., 2019** who studied Incidence of pressure ulcers in intensive care units and direct costs of treatment. They discovered a link between a longer hospital stay 8.9 days and a higher risk of pressure ulcers. Additionally, **Razi-Chafi et al., 2023** who revealed that the vast majority of the patients had less than 10 days of hospitalization.

Regarding the prevalence of pressure ulcers among the studied elderly patients, the findings indicated that these conditions affected the great majority of the elderly patients under study. These results were in agreement with **Nadukkandiyl et al., 2020** who found that approximately two thirds of pressure ulcer cases were reported in older adults 60–80 years of age. Regarding the location of pressure ulcer, these findings, nearly two thirds of the elderly patients had pressure ulcers in their heels, and nearly three quarters had pressure ulcers in their backs. From the perspective of the researcher, this could be because of most elderly patients were sitting and sleeping on back and to improve respiratory problems due to increase risk of chronic diseases in elderly. These results were on the contrary with **Mayrovitz et al., 2023** who studied venous, arterial, and neuropathic leg ulcers with emphasis on the Geriatric population. They reported that about two-thirds of ulcers were of neuropathic origin, with most on the forefoot. Also, **Artico et al., 2018** who found that the most common anatomical site was the sacrum/coccyx. Furthermore, **Razi-Chafi et al., 2023** revealed that the most common sites of pressure ulcers were sacrum, hip, and heel.

Two-thirds of the sample of elderly caregivers in the current study falls between the ages of 25 and 35. The findings were in the same line with a study done by **Lee et al., 2022** who assessed caregivers' knowledge,

attitude, and practice towards pressure injuries in Bangladesh, It was determined that more than three-quarters of the participants fell into the 18–27 and 28–37 age ranges. Also, the findings of the current study were consistent with **Alhammadi, &Ogale, 2020** who studied effectiveness of home caregivers teaching program on prevention of pressure ulcer in bed ridden elderly patients Ras Al Khaimah and Julphar Primary health Centers. They found that the more than half of elderly caregivers in the age of 21 to 41. On the other hand, **Farzan et al., 2023** who studied a systematic review of caregivers' knowledge and related factors towards pressure ulcer prevention they found that the average age of elderly caregivers was 40.5.

Regarding to gender, the current study showed that slightly more than half of elderly caregivers were male. The findings of the current study were in contrast with **Sari et al., 2022** who studied development and psychometric evaluation of an instrument to assess knowledge, attitude and practice of family caregivers at preventing pressure injuries in Indonesian community-dwelling older adults. They found that majority of studied elderly caregivers was female.

In addition to **BaniHani et al., 2023** who studied knowledge and practice of informal caregivers on pressure injury prevention and treatment among patients need palliative care in Jordan. Who found that slightly less than three-quarter of elderly caregivers were females. Also, these findings of the current study were consistent with **Alhammadi&Ogale., 2020** who found that the majority of elderly caregivers were females. Furthermore, **Tharu et al., 2022** who studied caregivers' knowledge, attitude, and practice towards pressure injuries in spinal cord injury at rehabilitation center in Bangladesh. It was discovered that over three-quarters of caregivers for the elderly were women.

As regarding to occupational status of elderly caregivers, the current study showed that housewives accounted for more than one-third of the elderly caregivers. This could be partly explained by the fact that they know a little bit about basic care but not much about transfer and positioning. Compared to PU care, they appeared to be more knowledgeable about the various facets of general care. The findings of the current study were consistent with **Lee et al., 2022** who revealed that more than two-thirds of caregivers were housewives. Also, **Tharu et al., 2022** showed that nearly two-thirds of the caregivers were housewives.

Regarding to the studied elderly caregivers' marital status, the current study showed that more than three-quarters of the elderly caregivers were married. From the researcher point of view, this may be due to most of them had age of marriage from 26-35 years old. The findings of the current study were in

agreement with **Lee, et al., 2022** and **Tharu et al., 2022** who showed that the majority of elderly caregivers were married. In contrast, **BaniHani et al., 2023** who revealed that more than three-quarters of elderly caregivers were unmarried.

In relation to education level, more than half of the studied elderly caregivers had only a basic education, according to the current study. This, in my opinion, may be related to Arab customs that emphasize that family caregivers who were unmarried and unemployed should have a greater concern for their patients than do those who work long hours. The findings of the current study were consistent with **Farzan et al., 2023** who showed that less than half of elderly caregivers were under diploma. On the opposite side, **Lee et al., 2022** showed that more than one-third of elderly caregivers had informal education. Moreover, **Sari et al., 2022** who found that more than three-quarter of elderly caregivers had low education. Furthermore, **Tharu et al., 2022** who showed that more than one-third of elderly caregivers had no formal education.

Regarding to the state of residence of caregivers, According to the results of the current study, most elderly caregivers shared a home with their patients. This, in my opinion, might be because family caregivers were the first to provide patients with care when they were living with the elderly. The findings of the current study were consistent with **BaniHani et al., 2023** who revealed that more than three-quarter of elderly caregivers lived with elderly patients. Also, **Tharu et al., 2022** who revealed that more than three-quarter of the elderly caregivers lived in the same house with elderly patients.

Concerning to the studied elderly caregivers total score of knowledge, the findings showed that less than three-quarters of the studied elderly caregivers had unsatisfactory knowledge level. A possible reason for explaining this unsatisfactory level of knowledge of the studied elderly caregivers may be due to certain factors. Firstly, the elderly caregivers had basic education that may not be able to acquire all information toward pressure ulcer prevention. Lack of knowledge and information toward PU prevention. Also, they had lack of support and guidelines about care and prevention of pressure ulcers from formal caregivers in hospitals.

The findings of the current study were contracted with **Farzan et al., 2023** who revealed that the level of caregivers' knowledge of PU prevention is moderate. Also, **Tharu et al., 2022** who showed that the majority of elderly caregivers had a moderate level of knowledge regarding the prevention and care of pressure ulcers PU. In addition, the knowledge and socio demographic traits of elderly caregivers revealed a strong correlation especially for age, extent of education, and the caregiver-patient dynamic.

According to the relation between the studied elderly caregivers knowledge and demographic data, it was observed that there were statistical significance difference between elderly caregivers knowledge level and (employment status, the educational level and the state of residence of caregivers and the relationship between the caregiver and the elderly). This finding was supported by **Farzan et al., 2023** who showed that occupation, level of education, and inpatient wards had a significant relationship with caregivers' knowledge regarding PUs prevention. Also, **Tharu et al., 2022** who demonstrated that the percentage of caregiver's knowledge increased. This clearly demonstrated that the knowledgeable caregivers were uninterested in carrying out their caregiver duties. Additionally to **BaniHani et al., 2023** who demonstrated that knowledge of PU prevention and treatment among informal caregivers had no association with education level, although education for informal caregivers plays a significant role in clinically improving patient status. Furthermore, **Lee et al., 2022** who revealed that if the patient was married, the mother and wife would likely take on the majority of the caregiving role, with the involvement of other family members being infrequent. On the other hand, **Farzan et al., 2023** indicated that one factor influencing the caregivers' degree of PU prevention knowledge was their marital status.

Conclusion

Based on the findings of the current study, it could be concluded that:

The amount of information regarding pressure ulcers that less than three-quarters of the elderly caregivers in the study possessed was inadequate.

Moreover, there was a statistically significant difference in the duration of hospitalization, ability to move, presence of chronic disease, and current PU among elderly patients.

Furthermore, there was a statistically significant difference in the knowledge of elderly caregivers based on their educational background, employment status, and living arrangements with the elderly.

Recommendations

In the light of the study finding, the present study recommended that:

- Creating an educational program to improve elderly caregivers' understanding of pressure ulcer management and prevention.
- Applying training program about pressure ulcers for elderly caregivers to increase competency.
- bigger sample size might be used for future research, which would include experimental and control caregiver groups in addition to routine

assessments to determine the standard of care provided to elderly bedridden patients at home.

References

1. **Alhammadi, H., &Ogale, R., (2020):** Effectiveness of home caregivers teaching program on prevention of decubitus ulcer in bed ridden elderly patients. *International Journal of Nursing*, Vol. (7), No. (2), Pp. 67-69.
2. **Amini, M., Mansouri, F., Vafae, K., Janbakhsh, A., Mahdavi, S., Moradi, Y., &Fallahi, M., (2022):** Factors affecting the incidence and prevalence of pressure ulcers in COVID-19 patients admitted with a Braden scale below 14 in the intensive care unit: Retrospective cohort study. *International Wound Journal*. Vol. (19), No. (8), Pp.2039-2054.
3. **Artico, M., Dante, A.,Angelo, D., Lamarca, L., Mastroianni, C., Petitti, T., & De Marinis, M., (2018):** Prevalence, incidence and associated factors of pressure ulcers in home palliative care patients: A retrospective chart review. *Palliative medicine*, Vol. (32), No. (1), Pp.299-307.
4. **Awad, W., &Hewi, S., (2020):** Effect of pressure ulcer preventive nursing interventions on knowledge, attitudes and practices of nurses among hospitalized geriatric patients in Alexandria, Egypt. *J Nurs Health Sci*, Vol. (9), No. (2), Pp. 1-12.
5. **BaniHani, H., Alnaeem, M., Saleh, M., &Nashwan, A., (2023):** knowledge and practice of Informal Caregivers on Pressure Injury Prevention and Treatment among Patients Need Palliative Care: A Cross-Sectional Study. Unpublished thesis of Institutional Review Board at the School of Nursing at the University of Jordan. Available at Research Square [<https://doi.org/10.21203/rs.3.rs-2481207/v1>].
6. **Bogaisky M, Dezieck L., (2015):** Early Hospital Readmission of Nursing Home Residents and Community-Dwelling Elderly Adults Discharged from the Geriatrics Service of an Urban Teaching Hospital: Patterns and Risk Factors. *J Am Geriatric Soc.*; Vol.(63), No. (3), Pp.548–52.
7. **Boyko T, Longaker M, and Yang G.,(2018):** Review of the Current Management of Pressure sores. *Journal of Advanced Wound Care (New Rochelle)*. Vol. (7), No. (2).Pp. 57–67.
8. **Cai, Y., Song W., Li and Jing, Ying and Liang, Chuqian and Zhang, Liyuan and Zhang, Xia and Zhang, Wenhui and Liu, Beibei and An, Yongpan and Li, Jingyi and Tang, Baixue and Pei., (2022):** the landscape of aging. *Science China Life Sciences*. Vol. (65), No. (12).Pp.2354-2454.
9. **Corbett L, Funk M, Fortunato G, O'Sullivan D., (2017):** Pressure injury in a community

- population: a descriptive study. *J Wound Ostomy Continence Nurs.*; Vol.(44), No. (3), Pp.221–7.
10. **Hartin, T., (2022):** Study.com. Understanding the three levels of Prevention. Retrieved on 08 October 2022. Available at: <https://study.com/learn/lesson/primary-secondary-tertiary-prevention-lev-els.html>.
 11. **Farzan, R., Yarali, M., Mollaei, A., Ghaderi, A., Takasi, P., Sarafi, M., &Karkhah, S., (2023):** A systematic review of caregivers' knowledge and related factors towards pressure ulcer prevention. *International Wound Journal*. Vol.(20), No. (8), Pp.3362–3370.
 12. **FathiaA. Mersal., (2014):** Caregivers' knowledge and practice regarding prevention of immobilization complications in El-demerdash Hospital Cairo Egypt. *American Journal of Research Communication*, Vol. (2), No. (3).P.P: 78-98. www.usa-journals.com, ISSN: 2325-4076.
 13. **Fletcher J, and Hall J., (2018):** New guidance on how to define and measure pressure sores. *Nursing Times*. Vol. (114), No. (10).Pp. 41-44.
 14. **Ibrahiem, D., &Abd El-Maksoud, M., (2021):** Training program for caregivers to prevent pressure ulcers among elderly residents at geriatric homes. *Frontiers of Nursing*, Vol.(8), No. (3), Pp.249-259.
 15. **Ingwu, J., Efekalam, J., Nwaneri, A., Ohaeri, B., Israel, C., Chikeme, P., &Omotola, N., (2019):** Perception towards mandatory continuing professional development programme among nurses working at University of Nigeria Teaching Hospital, Enugu-Nigeria. *International Journal of Africa Nursing Sciences*, Vol. (11), Pp. 100169.
 16. **Lee, S., & Lee, H.,(2022):** Impact of pressure ulcer prevention knowledge and attitude on the care performance of long-term care facility care workers: a cross-sectional multicenter study. *BMC geriatrics*, Vol. (22), No. (1), Pp. 1-12.
 17. **Matos, S., Souza, A., Abreu, M., Gomes, A., Oliveira, J., Silva, M., & Oliveira, S., (2023):** Pressure injury prevention in older people: construction and validation of an instrument for caregivers. *Revista Brasileira de Enfermagem*, Vol. (76), No. (1).
 18. **Mayrovitz, H., Wong, S., & Mancuso, C., (2023):** Venous, Arterial, and Neuropathic Leg Ulcers With Emphasis on the Geriatric Population. *Cureus*, Vol. (15), No. (4).
 19. **Mobayen, M., Karkhah, S., Bagheri, P., Feizkhah, A., Moghadam, M. T., Mohmmadnia, H., & Sadeghi, M. (2022).** Hospital-acquired pressure ulcers in trauma patients: a retrospective study of 410 patients at a referral trauma Center in the North of Iran. *The Open Nursing Journal*, Vol. (16), No.(1).
 20. **Nadukkandiyil, N., Syamala, S., Saleh, H., Sathian, B., Ahmadi Zadeh, K., Acharath Valappil, S.,& Al Hamad, H. (2020).** Implementation of pressure ulcer prevention and management in elderly patients: a retrospective study in tertiary care hospital in Qatar. *The Aging Male*, Vol. (23), No.(5), Pp:1066-1072.
 21. **Ramos, P., Borges, C., Azevedo, I., Almeida, P., Soares, A., Alves, P., &Magalhães, A., (2022):** Burden of informal caregivers of patients with pressure ulcers in a primary care setting. *Journal of Wound Care*, Vol.(31), No. (10), Pp.864-871.
 22. **Razi-Chafi, Z., Esmailpour-Bandboni, M., &Salmalian, Z., (2023):** Prevalence of pressure ulcer and its related factors in elderly patients hospitalized to teaching hospitals in East Guilan. *Journal of Current Oncology and Medical Sciences*, Vol.(3), No. (1), Pp.375-381.
 23. **Roussou, E., Fasoi, G., Stavropoulou, A., Kelesi, M., Vasilopoulos, G., Gerogianni, G., & Alikari, V. (2023).** Quality of life of patients with pressure ulcers: a systematic review. *Medicine and Pharmacy Reports*, Vol. (96), No.(2),Pp 123.
 24. **Sari, S., Everink, I., Lohrmann, C., Amir, Y., Sari, E., Halfens, R., &Schols, J. M., (2022):** Development and psychometric evaluation of an instrument to assess knowledge, Attitude and Practice of Family Caregivers at Preventing Pressure Injuries (KAP-PI) in Indonesian community-dwelling older adults. *BMC nursing*, Vol.(21), No. (1), Pp. 222.
 25. **Sultana, M., Ehsan, N., Zaman, L., Pinto, J., ShahidurRahman, A. K., &Ahsan, M., (2022):** Home-Health-Aides Role in Preventing Pressure Ulcers of the Older Adults: A Scoping Literature Review. *Archives of Clinical and Biomedical Research*, Vol. (6), No. (1), Pp. 74-84.
 26. **Tervo-Heikkinen, T., Heikkilä, A., Koivunen, M., Kortteisto, T., Peltokoski, J., Salmela, S., &Junttila, K. (2023).** Nursing interventions in preventing pressure injuries in acute inpatient care: a cross-sectional national study. *BMC nursing*, Vol. (22), No. (1), Pp.198.
 27. **Tesfa Mengist, S., Abebe Geletie, H., Zewudie, B., Mewahegn, A., Terefe, T., Tsegaye Amlak, B., & Mesfin, Y. (2022).** Pressure ulcer prevention knowledge, practices, and their associated factors among nurses in Gurage Zone Hospitals, South Ethiopia, 2021. *SAGE Open Medicine*, 10, 20503121221105571.
 28. **Tharu, N., Alam, M., Bajracharya, S., Chaudhary, G., Pandey, J., &Kabir, M., (2022):** Caregivers' knowledge, attitude, and practice towards pressure injuries in spinal cord injury at rehabilitation center in Bangladesh. *Advances in Orthopedics*.

Vol. (2022),Pp.(9).Available

at: <https://doi.org/10.1155/2022/8642900>.

29. **Thompson, S. (2012):** *Sampling* (Vol. 755). John Wiley & Sons.
30. **Zarei, E., Madarshahian, E., Nikkhah, A., & Khodakarim, S. (2019).** Incidence of pressure ulcers in intensive care units and direct costs of treatment: Evidence from Iran. *Journal of tissue viability*, Vol.(28), No.(2), Pp:70-74.