

Effect of Designed Pressure Ulcer Prevention Program on Caregivers' Knowledge of Immobilized Patientskhalid Fahd Alhosis ¹, Shereen A A Qalawa ², Dalia Salah E. Abd El-Moneem ³¹ Dean of Nursing College, Qassim University, KSA^{2&3} assistant professor, nursing College, Qassim University, KSADalia_elsedawy@hotmail.com

Abstract: Background: Pressure ulcer is one of the common problems in health care. As many as 60% or more of them develop in hospitalized patients. The National Pressure Ulcer Advisory Panel (NPUAP) estimated that prevalence of pressure ulcer in acute cases is 15%. Prevention is generally considered as the most effective way to confront this issue. **Objectives:** The aim of the current study is to evaluate the effect of designed pressure ulcer prevention program on caregivers' knowledge of immobilized patients. **Subject and methods:** Quasi-experimental design was utilized with 64 adult male & female caregivers of immobilized patients from medical, surgical and orthopedic units of King Fahd & medical and surgical units of King Saud hospitals were recruited. Two modified tools were used to collect data about sociodemographic characteristics & knowledge regarding pressure ulcer prevention which mainly cover four areas: skin care; proper positions; nutrition & Exercises. **Results:** results of the present study revealed that a highly statistical significant improvement of mean knowledge score in post test compared with pre test related to prevention of pressure ulcer through skin care, positions, nutrition and exercises as well as total mean scores of knowledge. In addition, there was no statistical significant difference in mean knowledge score between age groups, gender, and significance relation to patients among caregivers in pre test and post test. While there was a statistical significant difference in mean knowledge score regarding educational level of caregivers in pre test and post test. **Conclusion:** the implementation of the educational program for caregivers showed a remarkable increase and improvement of the caregiver's knowledge regarding preventive measures of pressure ulcer **Recommendations:** further researches can be done in the area of health education for prevention aspects concerning caregivers as a target such as prevention of deep venous thrombosis, chest infection.....etc.

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1. Introduction:

Bed sores more accurately called pressure sores or pressure ulcers. It defined as areas of damaged skin and tissue (Nalinidevin, 2008). Pressure ulcer has been a significant problem because it is occurred in every healthcare setting such as hospitals, nursing homes, and hospice and even at homes (Shahin et al., 2008). More than one million individuals develop pressure ulcers each year (Lalan, 2011). Moreover Thomas (2006) added that about 57 – 60 % of all pressure ulcers occur within hospitals, and pressure ulcers recognized worldwide as one of the five most common causes of harm to patients, as well as a largely preventable patient safety problem and increasingly described as an indicator of the quality of care provided by health care organizations.

According to Shahin et al., 2008 pressure ulcers have been described as one of the most costly and physically debilitating complications since the 20th century. On the other hand, pressure ulcers cause pain and discomfort, prolongs illness, delay rehabilitation and discharge, and may contribute to disability and death. Health care costs raise dramatically, the need for supplies, nursing hours, and

community resources increase, it is estimated that a pressure ulcer can increase the cost by 50 % (Catania, 2003).

Although the etiology of pressure ulcers is not fully understood (Jonsson, 2006), but it is very important to identify the groups at high-risk for pressure ulcers (Kim et al., 2009 & Samuel, 2010). The risk factors for it include age, moisture, nutritional deficit (Elizabeth, 2009). Moreover, pressure ulcer occurs exclusively in people with limited mobility, so it is a challenge to prevent the occurrence of pressure ulcer (Joyce, 2005).

However, there are two theories describe the development of pressure ulcer. One of the theories is that the initial pathologic changes occur in the deep muscle and progress upwards, so called bottom-to-top sore formation. The other theory is that the sore formation first begins in the epidermis and upper dermis and then progresses down if the pressure is not relieved, known as top-to-bottom sore formation (Jonsson, 2006).

Pressure ulcers classification typically involves 4 stages of ulceration which designed to describe the depth of a pressure ulcer at the specific

time of examination. Stage I represents intact skin with sign of impending ulceration that can be resolved within 24 hours of the removal of pressure. Stage II represents a partial-thickness loss of skin involving epidermis and possibly dermis. Stage III represents the loss of a full-thickness of skin with extension into subcutaneous tissue but not through the underlying fascia. Stage IV represents fullthickness loss of skin and subcutaneous tissue and extension into muscle, bone, tendon, or joint capsule (**Lowthian, 2005**). Moreover, The most common places for pressure ulcers are over bony prominences (bones close to the skin) like the elbow, heels, hips, ankles, shoulders, back, and back of the head (**Bathell, 2003 & Kuffler, 2010**).

Untreated pressure ulcers can lead to serious complications (**Joseph, 2010 & Jau, 2010**). Fortunately, Pressure ulcers are preventable (**Jayce, 2005**). The adage "Prevention is better than cure" holds good if proper care is given to the patients; who are at risk of developing pressure ulcers (**RAJ, 2009**).

Involvement of family caregivers is essential for optimal treatment of patients in ensuring treatment compliance, continuity of care, and social support (**Glajchen, 2004**). more than 6 million adults in the United States provide long-term, unpaid care to disabled persons. This service saves the health care system billions of dollars annually (**Schulz et al., 2003**). In addition, providing care through caregivers for patients support the patients as well as health care system where hospital stays are short, physicians are dissatisfied, and nurses are in short supply (**Donelan et al, 2002**). **Bookman & Harrington (2007)**, explain the contribution of the caregivers in patient's care as geriatric case managers, medical record keepers, paramedics, and patient advocates to fill dangerous gaps in a system that is uncoordinated, fragmented, and bureaucratic. Moreover, **Coleman et al, (2006)** concluded that intervention designed to encourage patients and their caregivers to assert a more active role in their care can reduce subsequent use of hospital and emergency services as well as reduce rate of re-hospitalization.

In conclusion, it is an innovative idea to share caregivers as a part of health care system to play a major role in patients' care such as preventing pressure ulcer. Caregivers' readiness for taking on the care giving role is based on an individual's previous experience, and knowledge (**Wu, 2009**). Therefore, it is important to improve care givers' knowledge for immobilized patients regarding pressure ulcer prevention. In response to this need, the present study is carried out to evaluate the effect of designed pressure ulcer prevention program on caregivers' knowledge of immobilized patients

Research Significance

Shahin et al., 2008 reported that pressure ulcers have been described as one of the most costly and physically debilitating complications since the 20th century. In addition, **Burdette-Taylor and Kass (2002)** reported that pressure ulcers are the third most expensive disorder after cancer and cardiovascular diseases.

Prevention is generally considered the most effective way to confront the occurrence of pressure ulcer (**D'Souza, 2007 & Samuel, 2010**). It can improve patient outcomes and reduce health service resource use and costs as well as human suffering (**Richens et al., 2003 & Chopra, 2004 & Burner, 2009**)

Prevention involves a variety of issues, including identification of those deemed to be at risk of developing pressure ulcers, appropriateness of care and increase awareness of the preventive measures of pressure ulcer (**Reddy, Gill, Rochon, 2006**). Involvement of caregivers in pressure ulcer prevention can ensure both quality care and reduce costs. Unfortunately, there were a few researches concerned with caregivers as a target to empower their knowledge regarding pressure ulcer prevention. In this concern, the current study was conducted to evaluate the effect of designed pressure ulcer prevention program on caregivers' knowledge of immobilized patients.

Conceptual Framework

Conceptual model of the current study was based on the educational model. This model seeks to empower people with accurate information so they can make informed decisions about health and is closely linked to the behavioral approach. This model assumes that individuals are able to make free choices once they are in full possession of the facts (**Whitehead, 2002**).

2. Subjects and Methods

Research Hypotheses

To fulfill the aim of the study, the following research hypotheses were tested:

H1: The mean post test total knowledge score among caregivers will be significantly higher than pre test total knowledge score.

H2: The mean post test knowledge score among caregivers will be significantly higher than pre test knowledge score regarding skin care.

H3: The mean post test knowledge score among caregivers will be significantly higher than pre test knowledge score regarding positioning.

H4: The mean post test knowledge score among caregivers will be significantly higher than pre test knowledge score regarding nutrition.

H5: The mean post test knowledge score among caregivers will be significantly higher than pre test knowledge score regarding exercise.

Research design

Quasi-experimental design, one group pre test-post test design was selected to evaluate the effect of designed pressure ulcer prevention program on caregivers' knowledge of immobilized patients

Study Setting:

This study was carried out in the medical, surgical and orthopedic units of King Fahd & medical and surgical units of king Saud hospitals in Qassim region (Kingdom of Saudi Arabia)

Target population

A sample of 64 adult male and female caregivers who were caring for immobilized patients admitted to the king Fahd & king Saud Hospital were recruited, (28 & 36 respectively). The inclusion criteria were caregivers for immobilized patients and willing to participate in the study. While the exclusion criteria include patients who had pressure ulcer.

Tools for Data Collection:

Data was collected using modified questionnaire from *Shiny, 2008*. The tool was modified by researchers then translated to Arabic language then retranslated to English again to be suitable for both An Arab and alien person's community value & perceptions. In order to achieve the purpose of this research, two tools were utilized to gather data pertinent to the study variables as follows:

Tool I : Socio – demographic data sheet:

Demographic data consisted of items seeking information about the background of the subjects such as age, gender, marital status & educational level & relation of the care giver to the patient.

Tool II: Structured knowledge questionnaire

The structured knowledge questionnaire in the present study was used to assess the caregivers' knowledge of immobilized patients regarding prevention of pressure ulcer. It consists of 23 items and it gathers data about four areas as follows, 1) Skin care - 9 items, 2) Position - 5 items, 3) Nutrition - 5 items, 4) Exercise - 4 items. Each item is scored as (1) for correct answer and (0) for wrong one, in addition, the caregivers considered as they had good knowledge if they had 60% of the total scores of the item. Content validity was obtained by two panels of experts from medical surgical staff members. Tool reliability was tested by *Shiny (2008)* $r = 0.96$.

Methods of Data collection:

Ethical considerations:

An official permission was taken from the research committee and hospital administrators. Also, each participant was informed about the purpose of the study and its importance. The investigator

emphasized that participation in the study is entirely voluntary; anonymity and confidentiality are assured through coding the data. Informed consent was taken from patients who accept to be included in the study.

Pilot Study:

The pilot study was carried out on 7 caregivers admitted in medical unit of king Fahd hospital, and they were excluded from the final study. The tools were applied in order to assess the clarity of the items in the tool. Almost all items were clearly understood and the respondents were found it appropriate. The findings of the pilot study revealed that all of the subjects had poor knowledge scores. The result of the pilot study confirmed that the study is feasible.

3) Procedure :

Once official permission was granted from the research committee and from the head managers of the selected hospitals to proceed with the study, the researchers initiated data collection. The investigators introduced themselves and explained the purpose and confidentiality of the study to the caregivers. Pre test was done in order to gain base line information related to preventive measures of pressure ulcer among the caregivers. Then, a structured teaching program was performed for them and after that immediate post test was gathered. Each caregiver was interviewed individually during pre post test and teaching program.

The teaching program covered information about skin care; proper positioning; nutrition and exercise as preventive measures of pressure ulcer. Structured teaching program were prepared by flip chart in order to impart knowledge to care givers. Brochures illustrated skin care, positioning, proper diet and exercise was also available for each subject. The time taken for each was approximately 45 minutes. Data collection phase was conducted over a period of three months. The time taken by the caregivers to complete the tool was approximately from 20 to 30 minutes.

Statistical analysis:

Collected data was arranged, tabulated and analyzed according to the type of each data.

Data analysis:

Data was collected and entered into a database file. Statistical analysis was performed by using the SPSS 16 computer software statistical package. Data was described by summary tables and figures. T-test & ANOVA were used. Statistical significance was considered at P -value ≤ 0.05

Limitation of the study

Hardly to find the same caregivers daily; that's why the researcher conducted the post educational test immediately after the educational program.

3. Results:

Table (1): shows that (65.6%) of the studied sample had age ranged between 30 to 50 years, with equal percent of males and females (50%). As regards level of education, (35.9% & 32.8%) of the sample had secondary and higher educational level respectively, while equal percent (15.6%) were illiterate or had primary education.

Figure (1) : illustrates that (76.6%) of the care givers had significant relation to the patients while (23.4%) had no significant relation to their patients.

Table (2): There were (96.9%) of the studied sample had poor total mean score of knowledge regarding pressure sores in the pre test, but in the post test (93.8%) of them had good knowledge scores. In addition, there was a highly statistical significant difference between pre test and post test of total mean knowledge scores (t-test 17.9) with (*p*-value .000).

Table (3): In relation to caregivers knowledge related to skin care, all of caregivers had poor knowledge mean score before the implementation of the program, while (85.9%) of them had good knowledge about skin care after the program. In addition, there was a highly statistical significant difference between pre test and post test of mean knowledge score related to skin care (t-test 16.5), with (*p*-value .000).

Table (4): As regards knowledge of proper patient's preventable positions of pressure ulcer, (92.2%) of the studied sample had poor knowledge in the pre test,

but (79.7%) of them had good knowledge in the post test. There was a highly statistical significant difference between pre test and post test mean knowledge score (t-test 18.4) and (*p*-value .000).

Table (5): shows that (89.1%) of the care givers got poor knowledge regarding nutrition in the pre test, while (87.5%) of them had good knowledge after implementation of the educational program. Also, there was a highly statistical significant difference between pre test and post test mean knowledge score related to proper preventable nutrition (t-test 17.1), with (*p*-value .000).

Table (6): In relation to knowledge regarding exercises, (73.4%) of the care givers got poor knowledge scores prior attending the educational program, while (67.2%) of them got good knowledge scores after attending it . There was a statistical significant difference between pre test and post test of mean knowledge score related to exercise (t-test 6.3) with (*p*-value .000).

Table (7): shows that there was no statistical significant difference in mean knowledge score between age groups, gender and significant relation of caregivers in pre test (*p* -value .569, .653 & .238) respectively and post test (*p*-value: .208, .311 & .479) respectively. While there was a statistical significant difference in mean knowledge score between educational levels among caregivers in pre test (*p*-value .002) and post test (*p*-value .032)

Table (1): Frequency distribution of the socio-demographic variables for the studied sample (N: 64).

Sociodemographic data	No	%
Age		
20 –	17	26.6
30 –	21	32.8
40 –	21	32.8
50	5	7.8
Gender		
Male	32	50
Female	32	50
Educational level		
Illiterate	10	15.6
Primary	10	15.6
Secondary	23	35.9
Higher education	21	32.8

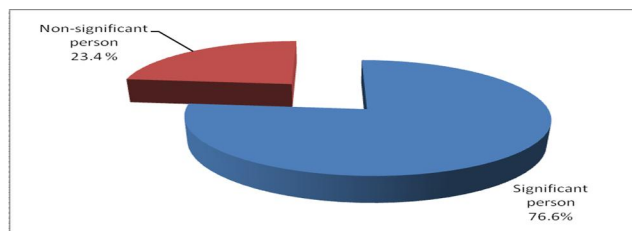


Figure (1): percentage of significances of persons who give care for the patients (caregivers) (N: 64).

Table (2): Frequency distribution and comparison of mean of total knowledge score in pre and post - test among the sample (N: 64).

Total scores (0-23)	Pre - test Phase		Post - test Phase	
	No.	%	No.	%
Poor knowledge (0-13)	62	96.9	4	6.2
Good knowledge (13-23)	2	3.1	60	93.8
Mean \pm SD	7 \pm 3.8		19.2 \pm 3.1	
t-test	17.9			
p-value	.000***			

*** Highly statistical significant difference

Table (3): Frequency distribution and comparison of mean of knowledge score among the studied sample in pre and post test in relation to skin care (N: 64).

Skin care (0-9)	Pre test phase		Post test phase	
	No.	%	No.	%
Poor knowledge (0-5)	64	100	9	14.1
Good knowledge (6-9)	0	0	55	85.9
Mean \pm SD	2.2 \pm 1.6		7.2 \pm 1.6	
t-test	16.5			
p-value	.000***			

*** Highly statistical significant difference.

Table (4): Frequency distribution and comparison of mean of knowledge score in pre and post test in relation to proper bedridden patient's positioning (N: 64).

Positioning (0-5)	Pre test phase		Post test phase	
	No.	%	No.	%
Poor knowledge (0-3)	59	92.2	13	20.3
Good knowledge (4-5)	5	7.8	51	79.7
Mean \pm SD	1.3 \pm 1.2		4.6 \pm 1.2	
t-test	18.4			
p-value	.000***			

*** Highly statistical significant difference.

Table (5): Frequency distribution and comparison of mean of knowledge score among the studied sample during pre and post test in relation to proper nutrition (N: 64).

Nutrition (0-5)	Pre test phase		Post test phase	
	No.	%	No.	%
Poor knowledge (0-3)	57	89.1	8	12.5
Good knowledge (4-5)	7	10.9	56	87.5
Mean \pm SD	1.9 \pm 1.3		4.6 \pm 1.1	
t-test	17.1			
p-value	.000***			

*** Highly statistical significant difference

Table (6): Frequency distribution and comparison of mean of knowledge score among the studied sample during pre and post test in relation to preventable exercises (N: 64).

Knowledge	Pre test phase		Post test phase	
	No.	%	No.	%
Poor knowledge (0-2)	47	73.4	21	32.8
Good knowledge (3-4)	17	26.6	43	67.2
Mean + SD	1.7 + 1.3		3 + 1.2	
t-test	6.3			
p-value	.000***			

*** Highly statistical significant difference

Table (7): Comparison of means between selected caregivers socio-demographic variables and total mean knowledge score in pre and post- test (N: 64).

Sociodemographic Variables	Pre - test Phase	Post - test Phase
Gender		
Male, Mean \pm SD	7.3 \pm 3.8	19.6 \pm 2.6
Female, Mean \pm SD	6.8 \pm 3.9	18.8 \pm 3.5
t-test	.452	1.021
p-value	.653	.311
Care givers significance		
Significant, Mean \pm SD	7.4 \pm 3.7	19 \pm 3.3
Non-significant, Mean \pm SD	6 \pm 4.2	19.7 \pm 2.2
t-test	1.191	.712
p-value	.238	.479
Age		
F-test	.677	1.560
p-value	.569	.208
Level of education		
F-test	5.692	3.131
p-value	.002*	.032*

*** Highly statistical significant difference

4. Discussion

In response to the increase incidence of pressure ulcers, education of patient's caregivers is essential to deliver ideal care and promote optimum health as well as cost benefit. Therefore, the aim of the current study was to evaluate the effect of designed pressure ulcer prevention program on caregivers' knowledge of immobilized patients.

Regarding sociodemographic characteristics of the studied sample, the current study revealed that near two thirds of the caregivers had age ranged between 30-50 years with equal percent of males and females, also more than two thirds of the studied sample had secondary and higher educational level while below one quarter were illiterate, in addition, about three quarters of the care givers had significant relation to the patients. These findings go into the same line with *El-Daharja, 2009* who studied the effect of family training on prevention of pressure ulcer, reported that 11.3% from the participants completed elementary school , 20.0% have completed

preparatory school , 31.3% completed secondary school, 37.5% completed university education. Also, 41.2% of the participants were males while 58.8% were females. On the other hand, *Raj, 2009 & Campbell et al., 2010* reported that the percentage of bedridden men patients (67.5%) is higher than bedridden women patients (32.5%) among total bedridden patients in his study.

Regarding relationships between caregivers' sociodemographic characteristics and their total mean knowledge score, the study results revealed that there was a statistical significant difference regarding level of education of caregivers and their total mean knowledge score in pre-test and post-test, whereas, the caregivers who had higher school education had higher mean score of knowledge than the other levels of education. These findings supported by the finding of *El-Daharja , 2009*, who reported that participants completed the university education facilitated the efficiency of educational program administration and application as they are qualified to deal and prevent

pressure sore and has the ability to learn other members in family how to deal with such problem. While, the other groups with different educational levels need modifications in the educational program to met their needs in training.

In relation to gender, the study results found that there was no statistical significant difference in mean knowledge score between males & females. In contrast, *El-Daharja, 2009* reported that there was a relation between a caregiver's gender and acquisition of program knowledge as the female caregivers were positively affected and fostered the education program and the result of the program than men.

Concerning total knowledge score of the research sample regarding pressure ulcer, the results revealed that the majority of the studied sample had poor total knowledge score prior attending the educational program, while most of them had good knowledge scores after implementation of the program. Additionally, there was a statistical significant improvement in the total mean knowledge score in post test comparing to pre test. The study results congruent with the study of *Paquay et al., 2010* who investigated the effect of the implementation of a patient and family education program for pressure ulcer prevention for home care, concluded that quality of pressure ulcer prevention practices improved after implementation of the guideline educational program. In addition, *Gryphonck & Defloor, 2010* necessitated that if pressure ulcer prevention protocols have been learned, practitioners will use them correctly in practice, and this will result a reduction in pressure ulcers.

In this concern, *Silva et al., 2009* highlighted the role of caregivers for bedridden patient that requires caring regarding pressure ulcer prevention, nursing fits there to evaluate and to manage the patients' needs and the caretakers, which will contribute to the promotion of qualified attendance, and will make possible for the caretaker to be autonomous in the completion of the cares. Another study conducted by *Kurian, 2003* concluded that educational knowledge of immobilized orthopedic patients and their caregivers regarding prevention of complications related to immobilization, including pressure ulcer, were effective to prevent complications of immobilization.

In relation to knowledge of preventive aspects of skin care, the current study results revealed that all of caregivers had poor knowledge before attending the program, while the majority had good knowledge about skin care after implementation of the program. In addition, a highly statistical significant improvement of caregiver's knowledge was achieved in post test mean score compared to pre

test mean score. This finding congruent with *Shiny, 2008* who conducted a study to evaluate the effectiveness of structured teaching program on prevention of pressure ulcer for immobilized patients among care givers, his results concluded that majority of the family care givers had knowledge on skin care after implementation of the preventive educational program. Also, *Lalan, 2011* emphasized on maintaining skin integrity because client populations are thought to be at greater risk of developing pressure sores because of immobility like orthopedics clients with fractures impaired skin integrity.

Also, *Nesbitt (2004)* conducted a study to evaluate the outcomes of prevention education and skin integrity interventions on the incidence of pressure ulcer. These results suggested that education and implementation of appropriate skin care products and procedures and pressure ulcer prevention protocols may reduce the incidence of hospital acquired pressure ulcer

According to the Pressure Ulcer Prediction and Prevention Guidelines list several other recommendations related to maintaining tissue tolerance to pressure. Among these recommendations are providing knowledge regarding the use of mild cleansing agents to minimize dryness and treating dry skin with moisturizers. Healthcare agencies that implement educational programs focused on skin care protocols to prevent pressure ulcers and intervene as early as possible have been able to demonstrate reductions in the prevalence and incidence of pressure ulcers. (*Langemo et al., 2002*). Impaired skin integrity is a serious and potentially devastating problem in ill or debilitated patients. Therefore providing information about skin care to maintain skin integrity has great benefit (*Burner, 2009*).

Concerning caregivers' knowledge of proper patient's positions, the current study revealed that the majority of the studied sample had poor knowledge in the pre test, while more than two thirds of them had good knowledge in the post test with a statistical significant improvement of knowledge regarding patient's position for preventing pressure ulcer in post test versus pre test. This finding matched with the study of *El-Daharja, 2009*, whereas his result stressed on the need for training program about proper patient's positions as the majority of the participants don't change and turn the patient position as soon as he /she became bed ridden and the caregivers are not aware that the pressure ulcer can occur after few hours if position did not change every 2 hours. Another study conducted by *Joseph, 2010*, who examined the effectiveness of application of water gloves on pressure areas in management of pressure ulcer among bed ridden patients, necessitated on the role of knowledge regarding repositioning

bedridden patients as one of the most common pressure ulcer prevention methods, and is considered a standard of care

Moreover, caregivers' knowledge regarding nutrition is required for prevention of pressure ulcer, the current study concluded that the most of caregivers had good knowledge after attending educational program in comparing to pre educational program with a statistical significant improvement in mean knowledge score in the post test when compared with pre test regarding nutrition. This finding was supported by, *El-Daharja, 2009* who reported in his study that knowledge regarding quality of food was improved after the training program for family caregivers of the bed ridden patients, in addition, The result of the study found that The food contains meat, veggies, fruits and corns has a big role in prevention and healing of pressure ulcers by a percent of 85.5%. Additionally, *Anderson et al., 2006* found a relationship between eating difficulties (dysphasia), malnutrition, and inability to eat without assistance. Those items can lead to development of Pressure ulcers among brain stroke patients who were admitted to rehabilitation institutions. Also, *Peterson, 2009* reported that adequate nutrition and hydrations are critical to the prevention and management of pressure ulcers.

In relation to caregivers' knowledge regarding preventable exercises to pressure ulcers for bedridden patients, the present study concluded that near two thirds of the caregivers got poor knowledge scores in the pre test, while the same percent of them got good knowledge score in the post test. Also, there was a highly statistical significant difference between pre test and post test of knowledge indicating that there was a high gain in knowledge score regarding exercise after program implementation. This finding supported by the study done by *Shiny, 2008* who concluded that there was a high gain in knowledge score regarding to exercise at post test knowledge score than pre test score after implementation of structured teaching program about pressure ulcer prevention. Also, *Varghese, 2007*, who examined the practice & knowledge of staff nurses regarding care of immobilized patients, highlighted the importance of movement or exercises in reasons of preventing complications such as pressure ulcer in immobilized patients.

In fact, pressure ulcer prevention policies and guidelines are gaining prominence in the face of rising costs, evidenced base care and litigation. Health care organizations and clinicians have a responsibility and a role to play in developing pressure ulcer risk management strategies in order to reduce the suffering and demand for resources caused by pressure ulcers (*Prentice et al., 2001*). Otherwise, In

order to establish good preventive strategy of pressure sore there are importance for upgrade major caregivers' pressure ulcer care knowledge and self efficacy, clinical nursing staff should provide them the care knowledge and skills such that bedridden patients can get high-quality care after returning home (*Elizabeth , 2009*).

Conclusion

The current study concludes that the designed pressure ulcer prevention program for caregivers of immobilized patients was effective in improving their knowledge. In addition, the study results supported the five hypotheses of the research.

Recommendations

- 1- Educational programs should be planned and offered on instructed basic knowledge to all caregivers with bedridden patients to minimize incidence of pressure ulcers.
- 2- Further research studies should be undertaken on the prevention of pressure ulcers in many geographical areas to investigate the confounding factors that hinder the form of development of pressure ulcers
- 3- Hospital Administrators needed to Support expands both nursing; caregivers' education and research to ensure establish preventive measures for bedridden survivors.
- 4- Further researches can be done in the area of health education for prevention aspects concerning caregivers as a target such as prevention of deep venous thrombosis, chest infection.....etc.

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