

Post training pressure injury knowledge and prevention practice among primary home caregivers of patients discharged from a Level 5 Hospital in Kenya

Stanley Kiarie Njau*, Lucy Kawira Gitonga**, Anna Kagure Karani*** Henry M. Nyamu ****

*School of Health Sciences, Kirinyaga University
**School of Nursing and Public Health, Chuka University
***School of Nursing, University of Nairobi (Posthumous)
**** Chuka University

DOI: 10.29322/IJSRP.13.09.2023.p14114
<https://dx.doi.org/10.29322/IJSRP.13.09.2023.p14114>

Paper Received Date: 15th July 2023
Paper Acceptance Date: 24th August 2023
Paper Publication Date: 6th September 2023

Abstract- Pressure injuries are wounds which occur on bony prominences, following prolonged hours of pressure or shear. Their incidence in community settings could be as high as 80%, but application of basic prevention knowledge can avert this trend. The objectives of the study were to determine the level of pressure injury knowledge after a training intervention, to determine the pressure injury prevention practice after the training intervention, and to examine the relationship between post training knowledge, and pressure injury prevention practice. This was a randomized controlled trial, which was conducted at multiple sites, that is, at Embu Level 5 Teaching and Referral Hospital, Kenya, and at patients' homes. It was organized in three phases, that is, baseline survey, intervention, and evaluation phases. Phase one was conducted at the hospital, while phase two and three were conducted at patients' homes. The overall sample size was 34 primary home caregivers, who were selected using simple random sampling technique, and assigned into experimental (n=17) and control groups (n=17) respectively. Data was collected using a researcher administered questionnaire, and an observation checklist. Approval to collect data was obtained from Chuka University Ethics Research Committee (Approval number NACOSTI/NBC/AC-0812), and a research permit was obtained from National Commission on Science, Technology and Innovation (License number: NACOSTI/P/22/21760). Data was analyzed using SPSS version 27, using descriptive and inferential statistics, at 95% confidence level. Majority of the primary home caregivers were female (88.2%, n=15), most (41.2%, n=7) of who were aged 29-38 years, with a mean age of $37.06 \pm 11.5SD$. Post training knowledge mean score was $37.28 \pm 10.39SD$, while the post training practice mean score was $40.4 \pm 10.4SD$. There was a statistically significant association, between post training pressure injury knowledge, and pressure injury prevention practice, at 95% confidence level ($\chi^2 = 6.199$, $df=1$, $p=0.013$). Both post training pressure injury knowledge and post training pressure injury prevention practice were poor. Primary home caregiver training can significantly improve pressure injury prevention practice, and therefore, continuous training and follow up is recommended.

Index Terms- Post-training, pressure injury, knowledge, practice, home caregiver

I. INTRODUCTION

Pressure injuries are wounds that develop due to insufficient tissue perfusion, following continuous pressure on bony protuberances, for example the occiput, scapula, elbow, sacrum or coccyx, as well as the heel (Hinkle & Cheever, 2017). The wounds are associated with reduced quality of life, mortality and morbidity. They can be prevented through application of preventive knowledge and skills, which is available through various guidelines, such as National Pressure Ulcer Prevention Panel (NPUAP) guidelines (NPUAP, 2019).

Treatment of pressure injuries is costly compared to prevention (Loikkanen&Tammi, 2016). In the US for instance, overall costs were well above 28.6 billion US dollars. These costs were incurred mainly because, the human resource was constrained due to the many hours that were spent taking care of these patients, which underscores the need to invest efforts in preventive strategies, to avoid incurring these exorbitantly high pressure injury management costs (Padula & Delarmente, 2019).

The global incidence of home acquired pressure injuries could be as high as 80%. Moreover, the point prevalence of community acquired pressure injuries across the USA was 6.6%, compared to 0.8% for hospital acquired pressure injuries (Kaur et al., 2018). According to Chen et al., (2020), in developing countries, the incidence of community acquired pressure injures among patients with spinal cord injuries was 22%, compared to 27% in developed countries. The authors further reported that, the incidence of community acquired pressure injuries was slightly higher in comparison to hospital acquired pressure injuries, but there were no significant differences in pressure injuries incidences between the developing and the developed nations.

In Kenya, the burden of pressure injuries has been reported at facility level. For instance, a study done at Kenyatta National Hospital, and Spinal Injuries Hospital, reported the prevalence as 5.5% (Nangole, 2010). In Embu County, particularly Embu Level Five Teaching and Referral hospital, 30% of bedridden patients have pressure injuries (Embu Level 5 Hospital Report, 2022-unpublished). These patients are in the hands of an already constrained work force, and some of them end up acquiring additional pressure injuries.

According to the findings of Hossein et al., (2021), in a systematic review on guidelines for home caregivers to prevent pressure injuries, the guidelines found agreed on the areas of focus, when it comes to training home caregivers. The areas included knowledge of the risk factors for pressure injuries, pressure injury characteristics, prevention interventions for pressure injuries, clinical features of pressure injuries, nutrition and hydration, complications of pressure injuries such as infections, the use of support surfaces, and use of assistive devices. The authors further argued that, if home caregivers are not given the necessary attention with regard to training on pressure injury prevention, their incidences will continue to increase forever, especially among patients requiring home based care.

II. LITERATURE REVIEW

In a descriptive survey which sought to determine the knowledge, and practice of pressure injury prevention among informal caregivers in Korea, pressure injury prevention knowledge mean score was 7.08 out of 15 points. Majority of the respondents (89%) scored highly on the knowledge concerning regular skin assessment, and two hourly turning of patients. As for home caregivers' pressure injury prevention practice, the average score was 46.8 out of 80 points. Respondents performed poorly especially with regard to nutritional intake of the patients as a preventive measure, and on incontinence care. The respondents scored highly in the area of two hourly changes of patients' position, and recording the turned position on a turning chart. The pressure injury practice was significantly associated with participants' pressure injury prevention knowledge (Lee & Lee, 2022).

Chiaprasert et al., (2019) studied the impact of a pressure injury training program, towards perceived self-efficacy and knowledge of home caregivers, as well as in reduction of pressure injuries risk. This quasi-experimental study revealed that, after participation in an eight week program, home family caregivers in the experimental group possessed significantly higher scores in knowledge, as well as perceived self-efficacy, compared to the control group.

Chong (2017) went ahead to develop a home-based program of education, and did a thorough investigation of its impact in terms of participants' knowledge and compliance. In this study, quasi-experimental design was employed, whereby pre-tests and post-tests were done. Pretests were done first, followed by a training program, and finally post-tests were done after a period of between two to four weeks, following the intervention. Data collection captured two major areas i.e. brief knowledge test on pressure injuries, and an observation checklist to assess the compliance with preventive measures. The results indicated an improvement in knowledge after the program whereby, before the program average knowledge score was 40% while after the program, this rose to 67%. As for compliance with preventive measures, prior to the program the mean score was 46% which increased to 78% after intervention. This improvement in both knowledge and practice was statistically significant at 95% confidence level.

According to the findings of a quasi experiment conducted by Ibrahim & El-Maksoud (2021) among formal caregivers, informal caregivers and geriatric patients on prevention of pressure injuries, the authors concluded that, training of the caregivers improved their knowledge, attitude and practice, at post test and follow-up visits. The authors further suggested that, such training could potentially reduce the incidences of pressure injuries, among the geriatrics.

In Kenya, few studies on pressure injury prevention have been done, with focus on health care providers, especially nurses. For instance, Getanda et al., (2016) assessed the knowledge of nurses on prevention of hospital acquired pressure injuries. The study found a significant association, between nurse's level of education, previous training on pressure injuries prevention, and previous involvement in pressure injuries related research, and their levels of knowledge. Little information was available in Kenya, with regard to assessment of home caregivers' knowledge on prevention of pressure injuries, and the effect of that knowledge on pressure injury prevention practice.

III. RESEARCH METHODOLOGY

Study area

The primary site was Embu Level 5 Teaching and Referral Hospital, Kenya, before the patients and their caregivers were discharged home. At the Hospital, the researcher targeted the medical and surgical wards, where majority of the bedridden patients were found. The secondary sites were the patients' homes, which was mainly within Embu County.

Study design

This was a randomized controlled trial which was organized in three phases i.e. baseline survey, intervention and evaluation.

Study population

The study was conducted among primary home caregivers, whose bedridden patients had been discharged from Embu Level 5 Teaching and Referral Hospital, Kenya.

Sample size determination

The sample size was calculated using Chan (2003) formula, as follows:

$$m \text{ (size per group)} = c \times \frac{\pi_1(1 - \pi_1) + \pi_2(1 - \pi_2)}{(\pi_1 - \pi_2)^2}$$

Where:

$c = 7.9$ for 80% power

π_1 and π_2 are the proportion estimates for statistically significant effect size (improvement of knowledge, practice and pressure injury incidences) after a training intervention.

Statistically significant estimates of effect size, were obtained from a similar study conducted by Karimi et al, (2018)
 m (size per group) = $7.9 \times \frac{[0.26(1 - 0.26) + 0.75(1 - 0.75)]}{(0.26 - 0.75)^2} = 12.49$

After factoring attrition rate of 30%, considering the fact that majority of the bedridden patients were critically ill, the desired sample size per group was:

$12.49 \times 1.3 = 16.24 \approx 17$ primary home caregivers.

Inclusion and exclusion criteria

This study included all the primary home caregivers, who were at least 18 years of age, and could speak the national language (Kiswahili). These care givers were taking care of bedridden patients, with high to severe risk for pressure injuries. The care givers included were willing to participate in the study, including being followed at home. On the other hand, the study excluded primary home care givers, who were not committed to patient care, until the completion of the evaluation phase of the study.

The bedridden patients were first identified purposively, with the assistance of the nursing officers in charge of medical and surgical wards. After identifying the patients, verbal consent was obtained from them, before assessing their pressure injury risk. Risk assessment was done using Braden scale, whereby, those patients who had pressure injury risk scores of ≤ 12 were included in the study, and their primary caregivers who consented, were interviewed.

Sample size and sampling technique

The overall sample size was 34 primary home caregivers whereby, 17 primary caregivers were randomly assigned into experimental group, and 17 were assigned into the control group, using simple random sampling. The researcher used specifically colored cards, including green (intervention) and blue (control), which were placed in a closed box. The box was thoroughly shaken to ensure that the cards were evenly distributed, before the researcher could pick a card. After the primary home caregiver had consented to participate in the study, the researcher would reach his hand into the box with colored cards, and pick a card at random, to determine which group the identified patients and caregivers would belong to. Single blind technique was employed whereby, the primary care givers were not informed which groups, i.e. intervention or control; they belonged to, in order to prevent Hawthorne effect, on the results of the study. This procedure continued, until the desired sample size was reached.

Data collection tools

Data was collected using a researcher administered questionnaire, developed based on national and international pressure injury prevention guidelines. The study also utilized an observation checklist, which was used to confirm the reported prevention practice. The tools for data collection were pretested on 4 eligible primary home caregivers, at Consolata Hospital Kyeni, which yielded a Cronbach's Alpha reliability coefficient of 0.8, and this was deemed adequate, according to the arguments of Taber (2018). The tool was scrutinized by experts in the field of tissue viability, to ascertain the content validity, and their feedback was incorporated in the final tool, before the actual data collection.

The questionnaire had three sections namely, socio-demographic characteristics of the primary home caregivers and their patients, pressure injury knowledge and pressure injury prevention practice. The knowledge and practice sections were unstructured to prevent guess work among the respondents. The observation checklist captured 8 verifiable items, i.e. ability to perform skin assessment, evidence of diaper change, use of pressure redistribution mattress, evidence of application of barrier creams on pressure areas, evidence of 2 hourly turning chart at the bedside of the patient, adequate nutrition and hydration status of the patient on physical examination, straightened bed sheets, and the head of bed not inclined more than thirty degrees. The observation checklist was used to verify the reported practice, before filling it in the questionnaire.

Data collection procedure

Phase one: Baseline survey

Baseline data was collected in the hospital at the nursing services manager's office, before the patients were discharged home, which involved the primary home care givers in both the experimental and control groups.

Phase two: Intervention

After discharge from the hospital, the patients and caregivers in the experimental group were followed at home, where training was conducted for thirty minutes, on definition of pressure injuries, risk factors, body parts prone to develop pressure injuries and how to prevent pressure injuries. Training guidelines were adopted and modified from the Nursing Council of Kenya, and National Pressure Ulcer Advisory Panel, guidelines.

Phase three: Evaluation

Evaluation was done one week after the pressure injury prevention training program. This was to allow the home caregivers enough time to internalize the concepts, practice preventive interventions, and do any consultations. The same questionnaire which had been

administered during the baseline survey was re-administered during evaluation phase. The reported practice was counterchecked against the observation checklist, to verify its authenticity. The post training knowledge and practice were correlated using Chi square and Pearson correlation, at 95% confidence level.

IV. RESULTS

Demographic characteristics of primary home caregivers

These results are based on the experimental group, which consisted of 17 primary home caregivers. The findings revealed that, majority of the primary home caregivers were female (88.2%, n=15), and most of them (41.2%, n=7) were aged 29-38 years. The mean age of the primary home caregivers was 37.06±11.5SD, which ranged from 20 to 60 years. Majority (52.9%, n=9) had secondary level of education and majority (70.6%, n=12) were married. As for the relationship between caregiver and the patient, all of them had a blood relationship whereby, majority (52.9%, n=9) were granddaughters of the patients. Concerning their occupations, majority (52.9%, n=9) were small scale farmers. The demographic characteristics of the primary home care givers are summarized in table 1.

Table 1: Demographic characteristics of the primary home caregivers

Caregiver characteristic	Frequency	Percentage
Gender		
• Male	2	11.8
• Female	15	88.2
Total	17	100
Age in years		
• 18-28	3	17.6
• 29-38	7	41.2
• 39-48	4	23.5
• 49-58	2	11.8
• 59-68	1	5.9
Total	17	100
Level of education		
• Primary	4	23.5
• Secondary	9	52.9
• Tertiary	4	23.5
Total	17	100
Marital status		
• Single	5	29.4
• Married	12	70.6
Total	17	100
Relationship with patient		
• Son	1	5.9
• Daughter	4	23.5
• Granddaughter	9	52.9
• Grandson	1	5.9
• Cousin	1	5.9
Total	17	100
Occupation		
• Formal employment	1	5.9
• Business	4	23.5
• Farmer	9	52.9
• Unemployed	1	5.9
• Student	2	11.8
Total	17	100

Post training pressure injury knowledge among the primary home care givers

Pressure injury training focused on definition of pressure injuries, risk factors for pressure injuries, body parts prone to pressure injury development and prevention of pressure injuries. After the training intervention, all the respondents could define pressure injuries correctly. Concerning the knowledge of risk factors for pressure injuries, all the primary care givers could correctly identify immobility or poor mobility as a risk factor.

As for the knowledge of body parts which are prone to pressure injuries, majority of the respondents (94.1%, n=16) correctly mentioned the elbows, and the mean score for this knowledge item was 94±24.3 SD. The pressure injury prevention knowledge item with the highest correct response mean score was on incontinence care whereby, 58.8% (n=10) knew the importance of diaper change, immediately the patient soiled himself or herself, and the mean score on this item was 59±50.7SD. These four pressure injury knowledge areas, i.e. definition, risk factors, body parts affected and prevention, consisted a total of 33 knowledge items, and the overall post training knowledge mean score was 37.28±10.39SD, as shown in table 2

Table 2: Post-training knowledge on pressure injuries among primary home caregivers

Knowledge item	Correct response n(%)	Mean±SD
Definition of pressure injury	17(100)	100±0
Risk factors		
Poor mobility/immobility	17(100)	100±0
Poor nutrition & hydration status	6(35.3)	35±49.3
Compromised blood flow	2(11.8)	12±33.2
Neuropathy	2(11.8)	12±33.2
Mental confusion	3(17.6)	18±39.3
Loss of stool and urine control	5(29.4)	29±47
Extremes of age	7(41.2)	41±50.7
Pain	1(5.9)	6±24.3
Support surfaces	1(5.9)	6±24.3
Skin color	0(0)	0±0
Body parts affected		
• Occiput	14(82.4)	82±39.3
• Ears	6(35.3)	35±49.3
• Shoulder blades	5(29.4)	29±47.0
• Shoulders	8(47.1)	47±51.4
• Elbows	16(94.1)	94±24.3
• Hip bone	13(76.5)	76±43.7
• Sit bones	9(52.9)	53±51.4
• Tail bone	3(17.6)	18±39.3
• Between the knees	11(64.7)	65±49.3
• Outer knees	8(47.1)	47±51.4
• Outer ankles	5(29.4)	29±47.0
• Between the ankles	6(35.3)	35±49.3
• Heels	14(82.4)	82±39.3
Prevention of pressure injuries		
• Skin assessment	1(5.9)	6±24.3
• Incontinence care	10(58.8)	59±50.7
• Ripple mattress	7(41.2)	41±50.7
• Change of wheelchair position	0(0)	0±0
• Barrier cream	9(52.9)	53±51.4
• 2 hourly turning	0(0)	0±0
• Nutrition and hydration	9(52.9)	53±51.4
• ≤30 degrees inclination of bed	3(17.6)	18±39.3
• Straightening creased bed sheets	0(0)	0±0
	Overall knowledge	37.28±10.39

Pressure injury knowledge was ranked further based on the 33 knowledge items whereby, a score of less than or equal to 8 (≤24%) was considered to be very poor knowledge level, 9-17 (≤52%) was considered to be poor knowledge level, 18-26 (≤79%) was considered to be moderate knowledge level and 27 or more (≥80%), was considered to be good knowledge level. The levels of post training pressure injury knowledge among the primary home care givers are summarized in figure 1.

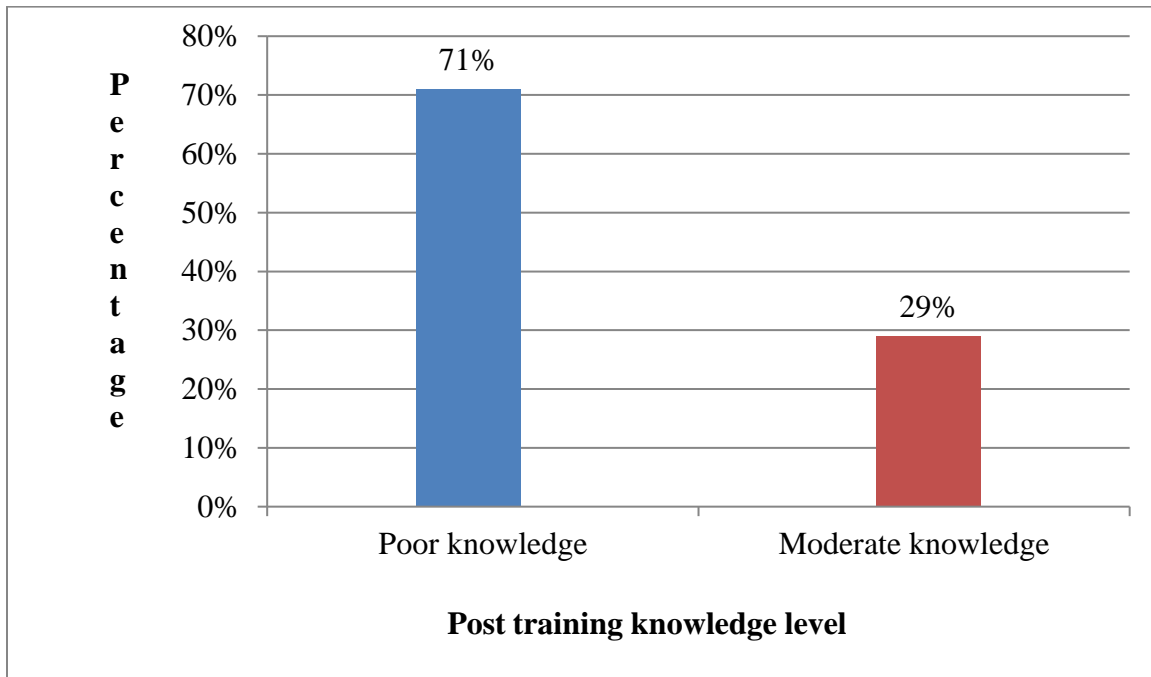


Figure 1: Post training pressure injury knowledge level among primary home caregivers

Post training pressure injury prevention practice among the primary home caregivers

Post training practice was assessed on eight practice items, which were objectively verifiable using an observation checklist. Pressure injury prevention best practice was on two hourly turning of patients whereby, every primary care giver performed the practice. The second best practice was on incontinence care whereby, 76.5 % (n=13) of the primary home caregivers were able change patients diapers, whenever they passed either stool or urine. The worst practices were observed in skin assessment, use of pressure redistribution mattresses, inclination of the head of the beds to less than thirty degrees and straightening of creased bed sheets. For these practices (skin assessment, pressure redistribution mattresses and inclination of the beds) only 5.9% (n=1) of the respondents performed them correctly, and for straightening of creased bed sheets, none of the primary home care givers had the correct practice. Post training pressure injury prevention practice for the various practice items is summarized in table 3.

Table 3: Post training pressure injury prevention practice among primary caregivers

Practice item	Correct practice n(%)	Mean±SD
Skin assessment	1(5.9)	6±24.3
Incontinence care	13(76.5)	76±43.7
Ripple mattress	1(5.9)	6±24.3
Barrier cream	11(64.7)	65±49.3
2 hourly turning	17(100)	100±0
Nutrition and hydration	11(64.7)	65±49.3
≤30 degrees inclination of bed	1(5.9)	6±24.3
Straightening creased bed sheets	0(0)	0±0
Overall practice score		40.4±10.4

Pressure injury prevention practice from the eight practice items was further ranked whereby, a score of ≤24% was considered to be very poor practice level, ≤52% was considered to be poor practice level, ≤79% was considered to be moderate practice level and ≥80% was considered to be good practice level. Majority (65%, n=11) of the primary home caregivers had poor post training pressure injury practice level, while 35% (n=6) had moderate practice level. The levels of post training pressure injury practice among the primary home care givers are summarized in figure 2.

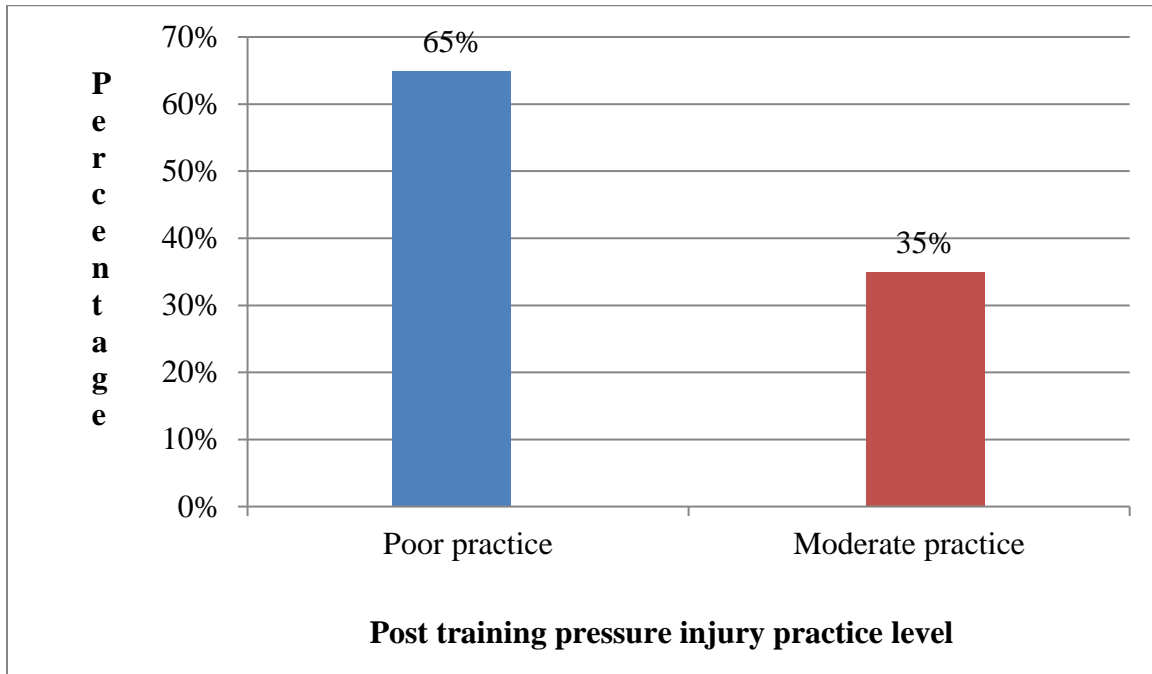


Figure 2: Post training pressure injury practice level among primary home caregivers

Post-training knowledge, and post training pressure injury prevention practice

The post training pressure injury knowledge and practice were measured at ordinal level as shown in figure 2 and figure 3 and also at ratio/scale levels, as shown in table 2 and table 3. The relationship between these two variables was assessed using chi squared test of association and Pearson correlation. Chi square test was used to determine whether the two variables were independent of each other, while Pearson correlation was used to give the direction of the relationship between the two variables.

Chi squared tests revealed that, there was a statistically significant association between post training pressure injury knowledge level and pressure injury prevention practice level after discharge from the hospital, at 95% confidence level ($\chi^2 = 6.199, df=1, p=0.013$). It was further observed that, participants with poor knowledge were 4 times more likely to have poor practice, compared to their counterparts with moderate knowledge (COR=4.167, CI=0.709-24.49). This meant that better knowledge was associated with better practice. This association is summarized in table 4.

Table 4: Association between post training pressure injury knowledge and practice

Characteristics		Practice				Statistics
		Poor		Moderate		
		n	%	n	%	
Knowledge	Poor	10	83.3%	2	16.7%	$\chi^2 = 6.199, df=1,$ $p=0.013$ COR=4.167 (CI=0.709-24.49)
	Moderate	1	20%	4	80%	

On the other hand, Pearson correlation revealed that, there was a very strong positive correlation between post training pressure injury knowledge and pressure injury prevention practice, at 95% confidence level ($p<0.001$). It further revealed that, 81.3% of the pressure injury prevention practice was due to pressure injury prevention knowledge. This correlation is summarized in table 5.

Table 5: Correlation between post training pressure injury knowledge and practice

Correlations

	Post training knowledge score	Post training practice score
Pearson Correlation	1	.813**
Post training knowledge score Sig. (2-tailed)		.000
N	17	17
Pearson Correlation	.813**	1
Post training practice score Sig. (2-tailed)	.000	
N	17	17

** . Correlation is significant at the 0.05 level (2-tailed).

V. DISCUSSION

Demographic characteristics of primary home caregivers

Majority of the primary home caregivers were female which meant that, caring for bedridden patients was mostly done by females. This could be due to the natural instinct of females to nurture and care for those in need. This finding was similar to what was reported by (García-Sánchez et al., 2019) whereby, male home caregivers had the notion that, care of bedridden patients is a preserve of female gender.

Most of the caregivers were aged 29-38 years, with a mean age of 37.06±11.5SD, which meant that they were youthful and could be having the energy required, to perform menial tasks related to patient care, such as two hourly turning, cleaning and incontinence care. This finding was similar to what was reported by Tharu et al., (2018) who found that, the average age for care providers in Bangladesh was thirty eight years. However this finding was different from that of Lee & Lee (2022) whereby, the average age of the caregivers in Korea, was 64 years.

The different ages of the caregivers could be due to different employment levels in different countries. For instance, if there is high rate of unemployment, we would expect relatively young caregivers, and if the rate of unemployment is low, we would expect mostly retirees to take care of the bed ridden patients. Majority of the primary home caregivers had secondary level of education which could be due to Kenya’s Governments’ efforts to subsidize education. This finding was different from that of García-Sánchez et al., (2019) who found that, majority of the primary home caregivers had primary level of education. As for marital status, majority were married, which meant that they had other family responsibilities besides taking care of the bedridden patients, and this finding was in agreement with that of Tharu et al., (2018).

As for the relationship between caregiver and the patient, all of them had a blood relationship, where majority were granddaughters of the patients. This was different from the findings of Tharu et al., 2018, and the findings of Garcia-Sanchez et al., (2019) both of who reported that, majority rather than all; home caregivers had blood relationship with the patient. Concerning occupations, majority of the primary home caregivers were small scale farmers, which could be due to the agricultural nature of Embu County, which was the primary study area.

Level of pressure injury knowledge after a training intervention

Pressure injury training focused on definition of pressure injuries, risk factors for pressure injuries, body parts prone to develop pressure injuries, and prevention of pressure injuries. These areas were also assessed by Anthony & Thelly (2022), when they were assessing pressure injury knowledge among primary home caregivers. After the training intervention, all the respondents could define pressure injuries correctly and the pressure injury prevention knowledge item with the highest correct response mean score was on incontinence care. This finding was different from that of Lee & Lee (2022), who reported best knowledge in regular skin assessment and two hourly turning of patients.

The overall post training knowledge mean score was poor. This was in agreement with the findings of Anthony & Thelly (2022) that, despite lack of extremes of very poor or very good pressure injury prevention knowledge, majority of home caregivers’ knowledge was poor. However the findings were different from those of Motjaba et al., (2021) who reported that, caregivers had moderate knowledge of pressure injuries.

Post training pressure injury prevention practice

The best practice was on two hourly turning of the bedridden patients whereby, all the primary home care givers performed the practice, after training. This was considered to be a good improvement in practice, and could not have happened by chance. This finding was similar to that of Moreira et al., (2018) whereby, the two hourly turning of patients as a preventive practice improved to 100%, which was statistically significant.

The practice of proper nutrition and hydration had a mean score of 65±49.3SD which was considered to be a moderate practice. This finding was congruent with the findings of Moreira et al., (2018) whereby, practice on nutrition and hydration increased from 39% to 73%, and was considered to be a statistically significant improvement.

As for performance of skin assessment, the mean score was $6\pm 24.3SD$, which was considered to be very poor practice, probably due to the technical nature of the procedure, and the fact that thirteen body parts are quite many, for the primary care giver to assess. The practice of incontinence care had a mean score of $76\pm 43.7SD$ which was considered to be moderate practice. This performance was probably due to the odor that is normally present if a patient passes urine or stool, which makes it naturally very uncomfortable to stay around such a patient, and probably the only logical thing to do would be to change the soiled diaper.

The practice of the use of ripple mattress had a mean score of $6\pm 24.3SD$ which was considered to be very poor practice. This was probably due to poor economic status of the patients and their care givers, since majority could not afford health insurance, and purchasing a ripple mattress which was retailing at 15000 to 20000 Kenya shillings at the time, must have been a toll order.

Use of barrier creams as a practice had a mean score of $65\pm 49.3SD$ which was considered as moderate practice, probably due to affordability of the barrier creams. Most of the patients were using milking jelly called Arimis, which was serving the purpose just fine. The jelly was retailing at as low as 50 Kenya shillings. The practice of proper inclination of the head of the head, that is, inclination of not more than 30 degrees, had a mean score of 6% which was considered to be very poor practice. This was probably because; the kind of beds in the community settings did not have the necessary mechanical structures, to support ideal inclinations of the head of bed. Some patients were being managed on flat mattress that were placed on the floor, even without a bed, and their heads were propped with a heap of old clothes, pillows and other paraphernalia.

Practice of straightening creased bed sheets to prevent shearing forces on the skin remained the same during the pre training and post training period, with a mean score of zero for both periods. This was probably because the practice might have appeared very trivial, and the primary home care givers might not have given it the weight it deserved. The other reason could have been that bed sheets get creased quite often, and it is cumbersome to keep straightening them.

Post training knowledge and pressure injury prevention practice

There was a statistically significant association between post training pressure injury knowledge and pressure injury prevention practice after discharge from the hospital. This finding was similar to that of Ibrahim & El-Maksoud, (2021) who concluded that, training of primary caregivers improved their knowledge, attitude and practice at post test and follow-up visits. It was further observed that, participants with poor knowledge were 4 times more likely to have poor practice, compared to their counterparts with moderate knowledge. This meant that better knowledge was associated with better practice, and if training interventions could be done regularly, then pressure injury prevention practice could improve drastically, and probably the pressure injury incidences in the community, could also reduce significantly.

VI. CONCLUSION AND RECOMMENDATIONS

The study concluded that, the post training pressure injury prevention knowledge and practice were poor, but there was a significant association between post training knowledge and practice, at 95% confidence level. It was recommended that, more training interventions should be done frequently, to improve pressure injury prevention knowledge and practice, in community settings.

ACKNOWLEDGEMENT

I acknowledge the assistance and guidance of Professor Lucy Gitonga, the late Professor Anna Karani and Dr. Henry Nyamu, who were very supportive in all dimensions of this research work.

REFERENCES

- [1] Antony, L., & Thelley, A. (2022). Knowledge on Prevention of Pressure Ulcers Among Caregivers of Patients Receiving Home-based Palliative Care. *Indian Journal of Palliative Care*, 28(1), 75–78. https://doi.org/10.25259/IJPC_84_2021
- [2] Chan, Y. (2003). Randomized Controlled Trials (RCTs)-Sample Size: The Magic Number? *Singapore Medical Journal*, 44(4), 172–174.
- [3] Chen, H.-L., Cai, J.-Y., Du, L., Shen, H.-W., Yu, H.-R., Song, Y.-P., & Zha, M.-L. (2020). Incidence of Pressure Injury in Individuals With Spinal Cord Injury: A Systematic Review and Meta-analysis. *Journal of Wound Ostomy Continence Nursing*, 47(3), 215–223.
- [4] Chiaprasert, S., Sakunhongsophon, S., & Terathongkum, S. (2019). Effects of Pressure Sore Prevention Program on Knowledge and Self-Efficacy of Family Caregivers in Decreasing Pressure Sore Risk of Persons with Cerebrovascular Disease. *The Bangkok Medical Journal*, 15(1), 51–56.
- [5] Chong, C. (2017). Pressure ulcer prevention & management: Evaluation of a home-based education program for caregivers of elderly: A pilot study. Presentation F8.1. HA Convention.
- [6] García-Sánchez, F., Martínez-Vizcaíno, V., & Rodríguez-Martín, B. (2019). Patients' and Caregivers' Conceptualisations of Pressure Ulcers and the Process of Decision-Making in the Context of Home Care. *International Journal of Environmental Research and Public Health*, 16(2719), 1–14.
- [7] Getanda, A., Chirchir, V., Omune, F., Tanui, C., Kosgei, A., & Ayumba, R. (2016). Awareness of Risk Assessment and Prevention of Pressure Ulcers amongst Nurses Working in Surgical and Orthopedic Wards of a Kenyan National Hospital. *Kenyan Journal of Nursing and Midwifery*, 1(1), 1–10.
- [8] Hinkle, J., & Cheever, K. (2017). *Textbook of Medical Surgical Nursing* (14th Edition). Lippincott Williams and Wilkins.
- [9] Hossein, R., Zohreh, V., Mohammadi, E., & Hosseinzadeh, K. (2021). The Role of Family Caregivers in Pressure Injury Prevention Guidelines: A Scoping Review. *Home Healthcare Now*, 39(5). <https://doi.org/10.1097/NHH.0000000000001000>
- [10] Ibrahim, D., & El-Maksoud, M. (2021). Training program for caregivers to prevent pressure ulcers among elderly residents at geriatric homes. *Frontiers of Nursing*, 8(3), 249–260. <https://doi.org/10.2478/fon-2021-0026>

- [11] Karimi, F., Yaghoobinia, F., Keykhah, A., & Askari, H. (2018). Investigating the Effect of Home-Based Training for Family Caregivers on the Incidence of Bedsore in Patients with Stroke in Ali Ebne Abitaleb Hospital, Zahedan, Iran: A Clinical Trial Study. *Medical Surgical Nursing Journal*, 7(3).
- [12] Kaur, S., Singh, A., & Kaur, T. (2018). Comparison of Two Intervention Strategies on Prevention of Bedsores among the Bedridden Patients: A Quasi Experimental Community-based Trial. *Indian Journal of Palliative Care*, 24(1), 28–34.
- [13] Lee, S.-B., & Lee, H.-Y. (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*, 22(988), 1–12.
- [14] Loikkanen, R., & Tammi, M. (2016). Pressure ulcer prevention and its implementation in practice—a literature review. *Helsinki Metropolia University of Applied Sciences*.
- [15] Moreira, A., Silva, M., Darder, J., Coutinho, J., Vasconcelos, M., & Marques, M. (2018). Effectiveness of an educational intervention on knowledge-attitude-practice of older adults' caregivers. *Revista Brasileira de Enfermagem*, 71(3), 1055-62.
- [16] Motjaba, J., Asra, N., Hossein, R., & Karimi, T. (2021). Pressure Injury Prevention Knowledge Among Family Caregivers of Patients Needing Home Care. *Home Healthcare Now*, 39(4), 203–210.
- [17] Nangole, F. (2010). Pressure ulcers presentations and management at Kenyatta National Hospital and Spinal Injury Hospital. *East African Medical Journal*, 12.
- [18] NPUAP, EPUAP, & PPPIA. (2019). *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide*.
- [19] Padula, W. V., & Delarmente, B. A. (2019). The national cost of hospital-acquired pressure injuries in the United States. *International Wound Journal*, 16(3), 634–640.
- [20] Taber, K. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education*, 48(1), 1273–1296.
- [21] Tharu, N., Alam, M., Bajracharya, S., & Kabir, M. (2018). Knowledge, Attitude and Practice Among Caregivers Towards Pressure Ulcer in Spinal Cord Injury at Rehabilitation Center in Bangladesh [The Hong Kong Polytechnic University]. <https://orcid.org/0000-0002-6320-3329>

AUTHORS

First Author – Stanley Kiarie Njau, School of Health Sciences, Kirinyaga University

Second Author – Lucy Kawira Gitonga, School of Nursing and Public Health, Chuka University

Third Author – Henry Nyamu, Chuka University