

Expertise and impediments in pressure ulcer nursing care – A cross sectional study

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Received: 03rd September 2020; **Accepted:** 16th March 2021; **Published:** 01st April 2021

Abstract: *Introduction:* Pressure ulcer (PU) continues to remain a challenge even though it is a preventable condition and sufficient progress being accomplished in medical field for its prevention and management. The role of nursing staff in PU care is of paramount importance with far reaching consequences. *Objective:* In the present study we aim to evaluate knowledge on pressure ulcer prevention & care amidst nursing professionals working in direct care with adult and geriatric patients. *Methods:* It was a cross-sectional study. Pieper's Pressure Ulcer Knowledge Test (PUKT) was used to assess the knowledge by observing the responses on ulcer assessment, wound assessment and PU prevention. *Results:* A total of 239 research participants completed the study. The mean of total correct response was 28.46 ± 6.5 with the individual mean for correct response to questions related with ulcer, wound and prevention being 4.02 ± 1.5 , 3.81 ± 1.4 and 20.71 ± 4.6 respectively. Maximum correct responses were observed for questions related with prevention of PU. Nursing professionals involved in routine care of patients performed better in all the aspects of knowledge test. The most common barrier identified were lack of sufficient time and inadequate staff followed closely by lack of training/ resources/ equipment/ guidelines. *Conclusion:* The identification of deficient areas can guide strategic planning for dissemination and adoption of preventive measures which could be adopted by entire interdisciplinary wound care team.

Keywords: Knowledge, Nursing Professionals, PUKT, Ulcer Assessment, Wound Assessment.

Introduction

Pressure ulcer (PU) could be defined as an area of localized destruction of integument with/ without involvement of the underlying soft tissue. It is usually noticed over a bony prominence or could be related to the use of medical or other devices [1]. Depending upon the grade of Pressure ulcer it may manifest as either intact skin or an open ulcer and may or may not be painful. It occurs as a result of extreme and/or continuous pressure in association with shear.

The resilience of soft tissue for pressure and shear may also be influenced by various factors like microclimate, nourishment, perfusion, co-morbidities and condition of the soft tissue [1]. Despite advances in health care, pressure ulcers still remain one of the most common and serious obstacle as they interfere with mobility and community reintegration, leads to a loss of

independence and more serious medical complications, and result in profound psychosocial consequences that may impact quality of life [2-3]. Owing to the high prevalence, increased financial and emotional implications of pressure ulcer in hospitalized patients, they are said to represent an important but largely preventable medical complication [4]. Research conducted in various developed nations provides an estimate of pressure ulcer prevalence in hospitals ranging from 8.3% to 25.1% [5-8]. Further, the costs of prevention and treatment of pressure ulcers is substantial [9-10]].

In order to reach care with quality, numerous researchers have been recommending that nursing professionals acquire scientific knowledge related to PU, as practice very often is not based on evidence but on myths, traditions and one's own or co-worker's

observations [11-14]. In literature, research on nurses and nursing students' knowledge on PU prevention and treatment demonstrate that their familiarity levels are associated with some individual and educational inclination [15-20]. An in-depth analysis of these studies also shows that, despite technological and scientific improvements in health and guidelines with recommendations for PU prevention, the obstacles still remain, and the knowledge level of nursing professionals' remains unsatisfactory.

With this study we therefore, aim to analyze knowledge on pressure ulcer prevention amidst nursing professionals working in direct care with adult and geriatric patients at a tertiary care hospital in New Delhi, India.

Material and Methods

The primary objective of this study was to assess nurses' knowledge of Pressure Ulcer management and the secondary objective was to identify knowledge gaps and barriers affecting successful implementation of Pressure Ulcers' management.

Data was collected between April and August 2016 using Pieper's Pressure Ulcer Knowledge Test (PUKT), which measures the participants' knowledge level on the recommendations for PU prevention. It is framed on the basis of suggestions recommended in international guidelines and comprises of 47 true-or-false assertions, with 7 components on ulcer assessment, 7 components on wound assessment and 33 components on PU prevention [16]. For every question, the participant selected a response from True (T), False (F) or I Do Not Know (NK). Each correct response corresponded to one point.

For wrong or NK answers, the score was zero. The total score on the knowledge test was the sum of all correct answers with 90% correct score as the cutoff score for passing [16].

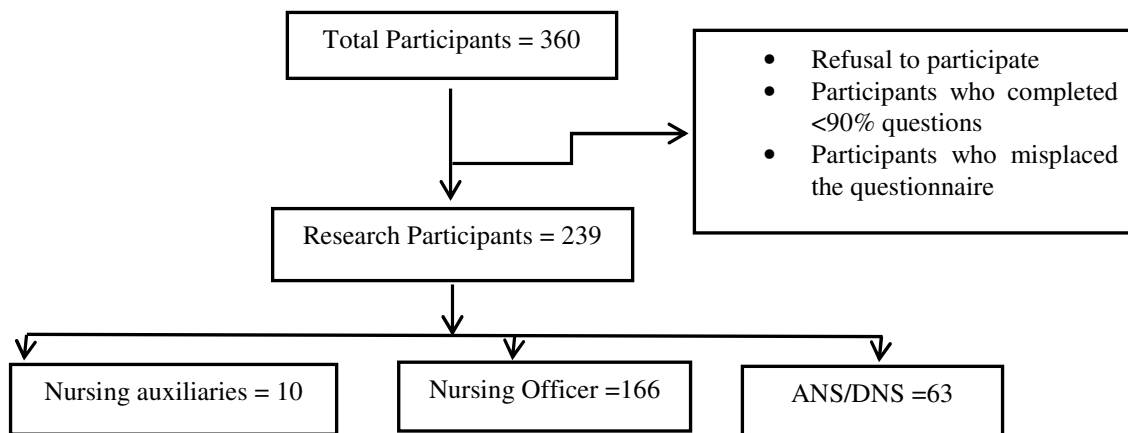
After explaining purpose and objective of the study, consent was obtained from every participant. The questionnaire was thereby distributed to all the nursing professionals who accepted to participate. The questionnaires were completed during work hours, and participants were asked to complete them without consulting with colleagues. Data was kept anonymously in the distributed questionnaire in order to maintain confidentiality.

Statistical Analysis: The data was managed using Microsoft Excel and analyzed using Statistical Package for Social Science, version 21.0 (SPSS). Variables related to educational characteristics were summarized and descriptively presented through frequency distribution, with absolute and relative figures. All continuous data was expressed as mean and standard deviation of mean. Within each group, change in the mean values of continuous variables with time was compared using repeated measure analysis of variance (ANOVA) test. Results were considered significant at 5% level of significance, i.e., $p < 0.05$.

Results

The questionnaires were distributed to a total of 360 participants (Figure 1) however, research participants comprised only of 239 nursing team members.

Fig-1: Losses in data collection



The participants' distribution according to socio-demographic characteristics is shown in Table 1. The study population was a heterogeneous group with participants from various departments, maximum participation being from surgical units (n=86, 36%). The gender predilection was in favor of the female sex with 87.9% (n=210)

participation. More than 50% (n=128, 53.6%) of the participants had work experience of less than 20 years. Approximately 95% of the respondents interviewed had a formal training with 144 participants having a Nursing diploma and 85 having a bachelor's degree in Nursing.

Socio-demographic characteristics	Nursing Auxiliary (N =10)		Nursing Officer (N =166)		ANS/DNS (N =63)		Total participants (N =239)	
	n	%	n	%	n	%	n	%
Age								
<30 years	10	100%	46	27.7%	00	0%	56	23.4%
30-50 years	00	0%	96	57.8%	20	31.8%	116	48.5%
>50 years	00	0%	24	14.5%	43	68.2%	67	28.0%
Gender								
Female	07	70.0%	141	84.9%	62	98.4%	210	87.9%
Male	03	30.0%	25	15.1%	01	1.6%	29	12.1%
Educational Qualification								
Intermediate	10	100%	00	0%	00	0%	10	4.2%
Nursing Diploma	00	0%	88	53.01%	56	88.9%	144	60.2%
Bachelor's Degree	00	0%	78	46.99%	07	11.1%	85	35.6%
Years of Employment								
<10	10	100%	64	38.5%	0	0%	74	31.0%
10-20	00	0%	47	28.3%	07	11.1%	54	22.6%
21-30	00	0%	48	28.9%	31	49.2%	79	33.1%
>30	00	0%	07	4.2%	25	39.7%	32	13.4%

Data was also collected to ascertain the common barriers in PU management and to identify the source of knowledge regarding PU. The most common barrier identified were lack of time (n=57, 23.8%) and shortage of staff (n=56, 23.4%) followed closely by lack of training/

resources/ equipment/ guidelines (n=47, 19.7%) (fig-2). The most common source of knowledge established was the education acquired during In-service training (n=108, 45.2%) followed by university training (n=49, 20.5%) (fig-3).

Fig-2: Barriers identified in the implementation of Pressure Ulcer prevention and management

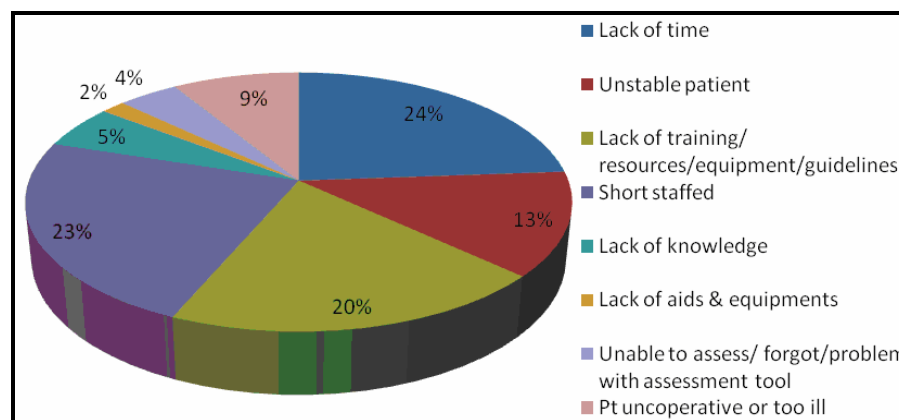
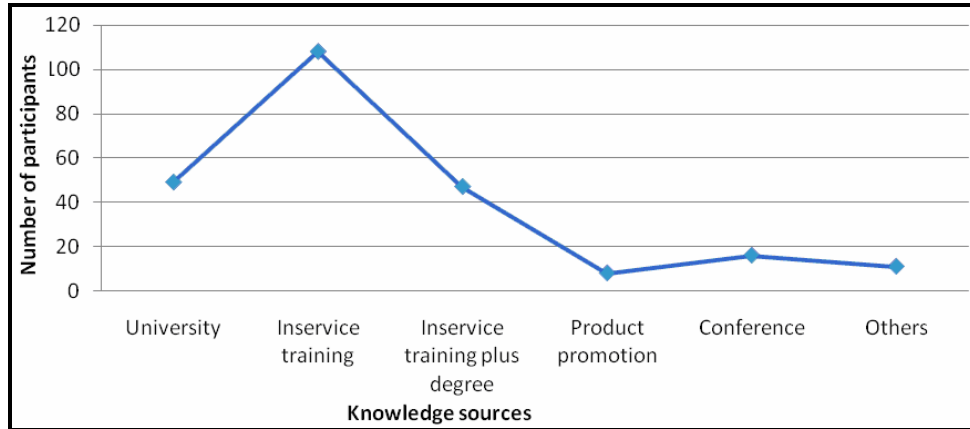


Fig-3: Knowledge source of Pressure Ulcer care



Further, the participants were also interviewed about the last time they either heard a lecture or read an article about pressure ulcers (fig-4). Supplementary input was also gathered regarding

the knowledge of guidelines for prediction and prevention of pressure ulcers and whether any such guidelines were being implemented in their respective departments (fig-5).

Fig-4: Last time participants listened to a lecture/read an article about Pressure Ulcers

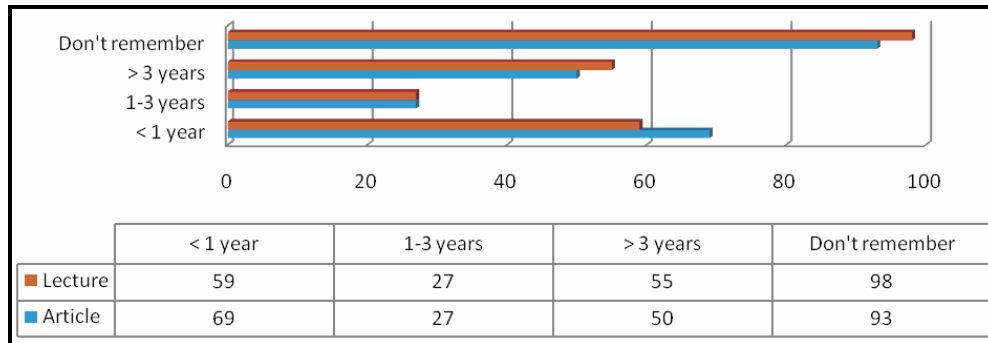
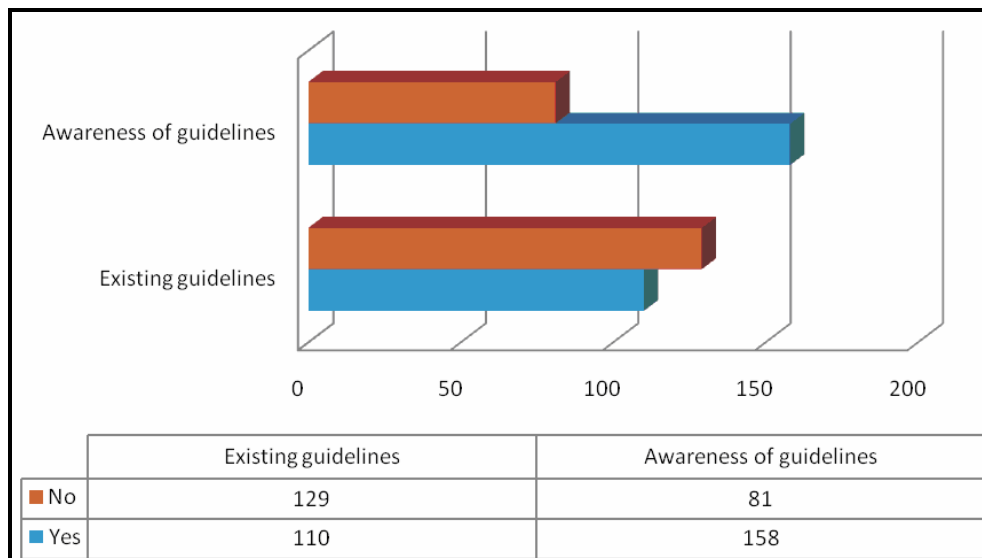


Fig-5: Implementation of Pressure Ulcer guidelines/ awareness of recent Pressure Ulcer guidelines



In the original study done using Pieper Pressure Ulcer Knowledge Test, participants were expected to give 90% or more of correct answers for knowledge to be considered adequate [16].

However, in this study none of the participants scored more than 90%, hence it was decided to present test results in score ranges of 80% or more, between 70% and 79.9%, between 60 and 69.9% and below 60%. Only four participants (1.7%) scored more than 80%, sixty-one participants (25.5%) scored between 70% and 79.9%, seventy-six participants (31.8%) scored between 60 and 69.9% and eighty-eight participants (41%) scored less than 60%. The

mean of total correct response was 28.46 ± 6.5 with the individual mean for correct response to questions related with ulcer, wound and prevention being 4.02 ± 1.5 , 3.81 ± 1.4 and 20.71 ± 4.6 respectively. Maximum correct responses were observed for the questions related with prevention of PU (table 2). Another interesting observation was that nursing professionals involved in active care of patients performed better in all the aspects of knowledge test with least number of correct responses given by nurses in the administrative posts. Similarly, participants with less than 10 years of working experience performed better in all aspects of PU care.

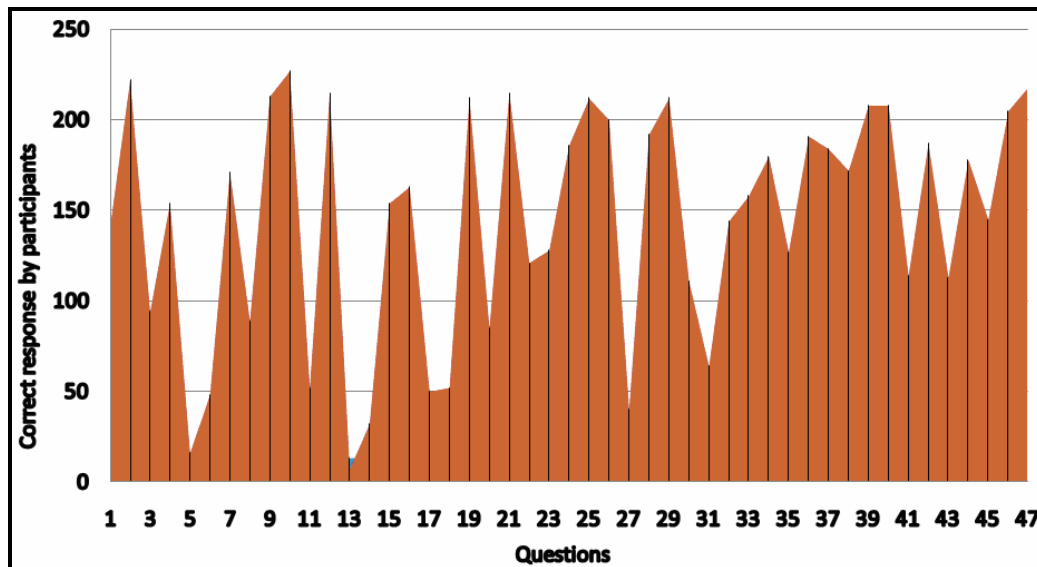
Table-2: Mean of correct responses; statistical test –ANOVA

	Correct responses (Total) Mean±S.D. (95% C.I.)	Correct responses (Ulcer) Mean ± S.D. (95% C.I.)	Correct responses (Wound) Mean ± S.D. (95% C.I.)	Correct responses (Prevention) Mean ± S.D. (95% C.I.)
Education				
Intermediate (n=10)	14.6 ± 5.19 (10.89-18.31)	1.60 ± 0.84 (1.00-2.20)	2.00 ± 1.49 (0.93-3.07)	11.1 ± 4.36 (7.98-14.22)
Nursing Diploma (n=144)	28.04 ± 5.51 (27.13-28.95)	3.94 ± 1.49 (3.69-4.18)	3.63 ± 1.35 (3.41-3.85)	20.64 ± 3.82 (20.01-21.27)
Bachelor’s Degree (n=85)	30.79 ± 6.05 (29.48-32.09)	4.44 ± 1.29 (4.16-4.71)	4.32 ± 1.25 (4.05-4.59)	21.95 ± 4.49 (20.98-22.92)
P value	0.000	0.000	0.000	0.000
Designation				
Nursing auxiliary (n=10)	14.6 ± 5.19 (10.89-18.31)	1.60 ± 0.84 (1.00-2.20)	2.00 ± 1.49 (0.93-3.07)	11.1 ± 4.36 (7.98-14.22)
Nursing Officer (n=166)	29.54 ± 5.71 (28.66-30.41)	4.11 ± 1.42 (3.90-4.33)	4.11 ± 1.38 (3.90-4.33)	21.37 ± 4.03 (20.75-21.99)
ANS/DNS (n=63)	27.81 ± 6.08 (26.28-29.34)	4.14 ± 1.49 (3.77-4.52)	3.29 ± 1.07 (3.02-3.55)	20.49 ± 4.33 (19.40-21.58)
P value	0.000	0.000	0.000	0.000
Years of employment				
<10 (n=74)	29.30 ± 7.41 (27.58-31.01)	4.03 ± 1.62 (3.65-4.40)	4.27 ± 1.58 (3.91-4.63)	20.96 ± 5.33 (19.73-22.19)
10-20 (n=54)	29.69 ± 6.52 (27.91-31.46)	4.11 ± 1.37 (3.74-4.48)	3.94 ± 1.45 (3.55-4.34)	21.57 ± 4.75 (20.28-22.87)
21-30 (n=79)	26.77 ± 5.96 (25.44-28.11)	3.78 ± 1.46 (3.46-4.11)	3.52 ± 1.19 (3.25-3.79)	19.66 ± 4.24 (18.71-20.61)
>30 (n=32)	28.59 ± 4.66 (26.91-30.27)	4.41 ± 1.52 (3.86-4.95)	3.22 ± 1.01 (2.86-3.58)	21.25 ± 2.55 (20.33-22.17)
P value	0.036	0.237	0.000	0.080

Aspects on which all the participants had the lowest percentage of correct answers were related to the use of heel protectors (n=7, 2.9%), massage of bony prominences (n=16, 6.7%), use of donut device/ ring cushions (n=32, 13.4%), significance of eschar in wound healing (n=40, 16.7%), characteristics of stage III PU (n= 48, 20.1%), etc. Maximum correct responses were observed on various aspects like inclusion of adequate

amount of protein and calories during illness (n=227, 95%), identification of risk factors for development of PU (n=222, 92.9%), inclusion of regular educational programs to reduce incidence of PU (n=218, 91.2%), keeping a written turning schedule for the patient at their bedside (n=215, 90%), characteristics of a stage IV PU (n=213, 81.9%), etc. (fig-6).

Fig-6: Number of correct responses per question



Discussion

Prevention of pressure ulcers is an indicator of quality of care [21]. Adequate knowledge about PU prevention is important as it would help in framing the decision of whether or not the patient is at risk of developing PU and which preventive measure needs to be implemented for the same. Moreover, nursing care has a considerable effect on pressure ulcer development and prevention with an inverse relationship between the two [22].

The results of the present study demonstrate inadequacies in knowledge among nursing professionals about pressure ulcers and their prevention. A criterion of $\geq 60\%$ correct response was used to identify participants having sufficient knowledge and most of them satisfied the set criteria (n=141, 61.57%). A greater cut-off would have led to more participants being considered not having adequate knowledge. Analogous results have been observed by Abou El Eneinet al [23] who concluded that nurses’ knowledge about

PU prevention was below the cutoff point they established (70%), also Beeckman et al [24] used a lower cutoff point (60%) and reported similar results. Similarly, a study conducted in Bangladesh indicated that the overall nurses’ knowledge on PUs prevention was found to be 57.79 % [25]. In a similar observation by Kaddourah et al [26] the knowledge about PU prevention and management was found to be moderate with a lower cutoff point (70%) where 73.3% participants met the criterion with a mean percentage score of 71.5 % for all participants. Correspondingly, a study undertaken by Pieper et al, using the same knowledge scale showed that the mean percentage of correct answers was 71.3 % [17].

In the United States, another study involving nurses from Montana used the preliminary version of the Pieper’s PUKT and concluded that the percentage of correct answers was 78% [13]. To summate though some studies

have showed a good level of knowledge (70–80%) among nurses [27-31], various others have shown limited knowledge with only less than 50% of nurses being aware of the recommendations [21, 32-33].

The present study also demonstrated significant difference in knowledge scores by levels of nursing education, designation and years of employment. In addition it was also observed that nurses actively involved in patient care performed better in the test than those involved in the administrative work. Moreover, nurses with less than 20 years of work experience performed better as they were actively involved with patients on a daily basis. These results are similar to the findings of Choa et al [34] who found that more knowledge about PU prevention was documented by nurses who were younger and had better educational qualifications. Another study done in Spain on Nurses' knowledge and clinical practice of pressure ulcer care also revealed that greater the nurses' interaction with patient, higher was the knowledge gained [20].

The reasons for such observation could be that nurses with prolonged exposure to patient care have greater chance to learn how to prevent pressure ulcer from their coworker's experience as well as from their own mistakes. The present study is though inconsistent with the findings of Pieper and Mott [16] who found that nurses' knowledge had no relation with their education, age or years of work experience. Likewise, work of Hulsboom et al [35] documented that demographic variables, including the age and experience of nurses, had no significant influence on PU prevention interventions.

The questions answered poorly by most of the participants were related to efficacy of massaging of bony prominences, use of heel protectors & ring cushions, role of eschar in wound healing. Similar findings have been documented in the studies by Zulkowski and Ayello [36] and Ayello et al [37]. A lot of conundrum was also observed on matters like turning, repositioning, offloading of heels, appropriate turning of bed bound patients, etc. These specific areas need reinforcement and education for staff working in clinical practice settings as lack of knowledge could lead to less than optimal care, especially if

nurses use and practice outdated methods and/or inconsistent therapies.

Moreover it was found that though 68.9% participants (n=158) were aware of the presence of guidelines for PU yet, only 48.03% (n=110) acknowledged the implementation of such guidelines in their respective departments. This observation is in line with the study conducted in Ethiopia where Nuru et al [21] found that 89.9 % of the nurses were not using any existing guidelines on risk assessment and prevention of pressure ulcer. Similarly, Moore and Price [3] also documented a gap between theory and practice despite nurses' positive attitudes toward PU prevention due to barriers such as a lack of staff and time.

In this study the dissipation of knowledge about PU prevention among nurses was found to be influenced by barriers related to the use of guidelines, lack of staff and time. Multiple factors could have contributed to the lack of nurses' knowledge revealed in this study with the most important being paucity of continuous educational opportunities, including the availability, timing, and cost of such programs, as well as the associated staffing issues. Similar findings have been reported by Jordan O'Brien and Cowman [39] who observed that paucity of time and staff was the main barrier to the completion of nursing documentation of PU care plans. Comparable results have also been reported by Moore and Price [38] who mentioned that the dissemination of knowledge among nurses is affected by the known barriers to the use of guidelines, like lack of staff and time, and probably by the quality of the guidelines.

The current study summates that despite the increased attention and new developments in the area of PU care, knowledge and more importantly, implementation of knowledge relevant for PU prevention is still low and has not increased significantly.

Limitations: This study was limited because of the small sample size. In addition, the study was conducted in a tertiary care hospital in an urban area. It would be interesting to see this study being applied to different hospitals in

both rural and urban areas. Further no information was collected about the nursing schools, but it would be intriguing to ascertain whether our nursing education system is adequately equipped to train the nursing professionals or otherwise. Finally, the authors would like to repeat this study before and after an educational intervention.

Conclusion

This study used a cross-sectional design to examine current knowledge among nursing

professionals regarding the measures to prevent pressure ulcers and demonstrated deficits in knowledge. The identification of deficient areas can guide strategic planning with a view to the dissemination and adoption of preventive measures and revision of the nursing educational curriculum in accordance with an evolving standard of care. It is important to remember that a nurse does not act alone hence, prevention of PU strategies must be an effort of the entire transdisciplinary wound care team.

Financial Support and sponsorship: Nil

Conflicts of interest: There are no conflicts of interest.

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Cite this article as: Chaudhary S and Singh N. Expertise and impediments in pressure ulcer nursing care– A cross sectional study. *Al Ameen J Med Sci* 2021; 14(2):128-136.

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