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Assessing Pressure Ulcer Knowledge of General and Orthopedic Surgical Residents Using the Pieper Pressure Ulcer Knowledge Test

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Abstract

Objective: To determine the knowledge of postgraduate and non-postgraduate general and orthopedic surgical residents regarding pressure ulcer (PU) prevention, staging and wound description.

Study Design: Cross sectional, descriptive survey.

Place and Duration of Study: Six major tertiary care hospitals in India, from Sep-2018 to Nov-2018.

Methodology: All consenting postgraduate and non-postgraduate general and orthopedic surgical residents were included in the study using convenience sampling. An adapted version of Pressure Ulcer Knowledge Test (PUKT) comprising of 47-true/false items was used as a research tool. For every correct response, 1 point was awarded. Whereas, an incorrect or NK response was scored as 0. All the data was entered and analyzed using SPSS version 21.

Results: A total of 126 trainees comprising 120 (95.23%) males and 6 (4.76%) females participated in the study. The average PUKT score obtained by the surgical residents was 30.2+3.7 (65.65%), thus indicating a "low" level of knowledge.

Conclusion: The current levels of knowledge regarding PU prevention among the surgical residents in our study was "low". The authors recommend continuous education for PU prevention in a hospital care setting.

Keywords: *pressure ulcers, pressure ulcer knowledge, surgical residents.*

Introduction

Pressure ulcers (PUs) are defined as localized injuries to the skin and/or underlying soft tissue, usually over a bony prominence or related to a medical device as a result of pressure and/or shear.[1] An estimated 1.7 million people develop PUs each year.[2] Worldwide, it has an incidence rate between 0.4% to 38% in hospital setting and 0 to 17% in nursing homes.[3] The development of PUs is associated with a poor quality of life, imposing a substantial psychological and social burden on patients and their families.[4] Moreover, PUs have also been ranked as the third most expensive disorder owing to a prolonged hospitalization and costly treatment.[3]

In order to minimize the occurrence of PUs in vulnerable patients, preventive strategies in compliance with the international guidelines must be implemented at the right time.[4] It has been established that prompt recognition, accurate staging and timely treatment of a PU can reduce the morbidity and mortality associated with this devastating disorder.[5] Despite the availability of evidence-based and internationally accepted guidelines, various studies have highlighted an extreme knowledge deficit among healthcare professionals towards PUs prevention.[2,6,7,8] Vanderwee et al assessed the adequacy

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of PU prevention in a hospital care setting with only 10% of the patients receiving preventive treatment in accordance with the approved guidelines.[9] Thus, to optimize the preventive care being practiced in the hospitals, a frequent evaluation of the knowledge and understanding of the healthcare professionals regarding PU management is recommended.

Various cognitive theories have established knowledge and education as the two most important factors influencing one's behavior and practices. It has been postulated that in order to achieve adherence to the proposed guidelines, it is necessary to improve the knowledge and skills of the entire concerned disciplines.[4] Till now, most of the studies have focused and assessed knowledge, attitude and skills about PU prevention among nurses and nursing students.[2,10,11] Very little literature is available regarding this topic in general and orthopedic surgical residents, despite of the fact that they are predominantly involved in the management of the complications of PUs.[7] We found only a few studies demonstrating limited PU knowledge among geriatric fellows, internal medicine residents and general physicians, however, surgical residents' understanding of PU prevention and care still needs to be explored.[6,7,8]

In light of the above facts, we conducted this study with an objective to determine the knowledge of postgraduate and non-postgraduate general and orthopedic surgical residents regarding PU prevention, staging and wound description. To our knowledge, this is probably the first study being carried out in India targeting surgical trainees to see whether or not they are well-informed and proficient at the clinical practice guidelines about PUs. The findings of this study would be useful to get an accurate picture of the preventive PU care being provided in the Indian surgical and orthopedic units. Moreover, the conclusions drawn from this study would enable us to identify and fill the knowledge gaps through various educational incentive programs.

Materials and Method

A cross sectional descriptive survey was conducted at six tertiary care hospitals in India between Sep-2018 to Nov-2018. The study population comprised of all the postgraduate and non-postgraduate general and orthopedic surgical residents recruited from each hospital using the convenience sampling method. All eligible participants were approached during their free time in their break rooms and the outline of the study was explained to them verbally by the researchers. An informed oral consent was taken from all the participants after explaining the study objectives. Confidentiality of participant's information was maintained properly where the participant had the choice to refuse and withdraw from the interview. The study was approved by the Ethical review board of the hospital.

To measure the knowledge of surgical residents, an adapted version of Pressure Ulcer Knowledge Test (PUKT) was used. This tool was developed by Pieper and Mott in 1995 to examine the knowledge of healthcare staff on PU prevention.[12] It comprises of 47-true/false items with 3 subscales: risk and prevention (33 items), pressure ulcer staging (7 items), and wound description (7 items). In the present study, one question regarding the assignment of a government committee to investigate PU risk was deleted from the original version as it did not relate with the current study conditions. For each of the remaining questions, participants had to choose one true response from among True (T), False (F), or I don't know (NK) options. For every correct response, 1 point was awarded. Whereas, an incorrect or NK response was scored as 0. The maximum achievable score on the test was 46.

In the original study, participants with a score of 90% or above were considered to have an adequate level of knowledge.[12] In our study, the range of scores was categorized as follows: <60%: very low; 60-69.99%: low; 70-79.99%: moderate; 80-89.99%: high and 90-100%: very high. All the data was entered and analyzed using SPSS version 21. For categorical variables, frequencies and proportions were calculated and for continuous variables, means and standard deviations were calculated. The descriptive analysis of data was presented in the form of tables and graphs. Respondents with missing data were omitted from specific analyses.

Results

A total of 126 trainees of general surgery and orthopedics participated in the study comprising 120 (95.23%) males and 6 (4.76%) females. Their age ranged from 28-32 years with a mean age of 28+2.3 years.

The average PUKT score obtained by the surgical residents was 30.2+3.7 (65.65%) with a range of 16-41, thus indicating a "low" level of knowledge regarding PU prevention (Table I).

When measured on sub-scales, 53% participants demonstrated a "moderate" level of knowledge (72.6%) about pressure ulcer staging. Whereas, the performance of the residents in providing a correct wound description was very poor with only 19.2% participants scoring "high" on this scale. Regarding risk assessment and PU prevention, a mean score of 31.3+4.1 was observed, thus exhibiting a "low" level of knowledge (68.04%) in this area. None of the participant was able to score >90% on any of the sub-scales (Fig 1).

A detailed assessment of resident's knowledge for each item on PUKT revealed that the majority of the participants (58%-73%) considered massaging bony prominences, repositioning a bed-bound person every 3 hours and using heel protectors to relieve pressure as important measures of PU prevention. Although these techniques have now become obsolete. Similarly, only 32.5% surgical residents considered fitting a chair cushion beneficial to avoid the development of PU in a chair bound person. However, most participants (82.53%) correctly identified elevating the heels off the bed as a good measure to reduce pressure. Surgical residents scored high (>80% correct) in identifying immobility, incontinence, impaired nutrition, and altered level of consciousness as risk factors for PU development, maintaining an adequate dietary intake of proteins and calories during illness, keeping the skin dry and clean, and recognizing the role of educational programs in reducing the incidence of PU (Table II and III).

Table I: Summary of knowledge scores

Level of knowledge	**N**	**%**
Very low (<60%)	33	26.19
Low (60-69.99%)	57	45.23
Moderate (70-79.99%)	22	17.46
High (80-89.99%)	12	9.52
Very High (90-100%)	2	1.58

Table II: PUKT items answered correctly by >80% of the residents

Item	N	%
Risk factors for development of pressure ulcers are immobility, incontinence, impaired nutrition, and altered level of consciousness. (T)	101	80.15
All individuals should be assessed on admission to a hospital for risk of pressure ulcer development. (T)	103	81.17
Cornstarch, creams, transparent dressings, and hydrocolloid dressings do not protect against the effects of friction. (F)	106	84.12
An adequate dietary intake of protein and calories should be maintained during illness. (T)	119	94.44
The epidermis should remain clean and dry. (T)	126	100
A low-humidity environment may predispose a person to pressure ulcers. (T)	124	98.41
To minimize the skin's exposure to moisture on incontinence, underpads should be used to absorb moisture. (T)	110	87.30
A good way to decrease pressure on the heels is to elevate them off the bed. (T)	104	82.53
Friction may occur when moving a person up in bed. (T)	102	80.95
Educational programs may reduce the incidence of pressure ulcers. (T)	126	100

Table III: PUKT items answered correctly by <50% of the residents

Item	N	%
It is important to massage bony prominences. (F)	18	14.28
Persons confined to bed should be repositioned every 3 hours. (F)	11	8.73
Heel protectors relieve pressure on the heels. (F)	13	10.31
Donut devices/ring cushions help to prevent pressure ulcers. (F)	20	15.87
In a side lying position, a person should be at a 30 degree angle with the bed unless inconsistent with the patient's condition and other care needs that take priority. (T)	8	6.34
A person who cannot move him or herself should be repositioned every 2 hours while sitting in a chair. (F)	6	4.76
A pressure redistribution surface reduces tissue interface pressure below capillary closing pressure. (T)	39	30.95
A low Braden score is associated with increased pressure ulcer risk. (T)	28	22.22
Eschar is good for wound healing. (F)	45	35.71
Undermining is the destruction that occurs under the skin. (T)	54	42.85
Chair-bound persons should be fitted for a chair cushion. (T)	41	32.53

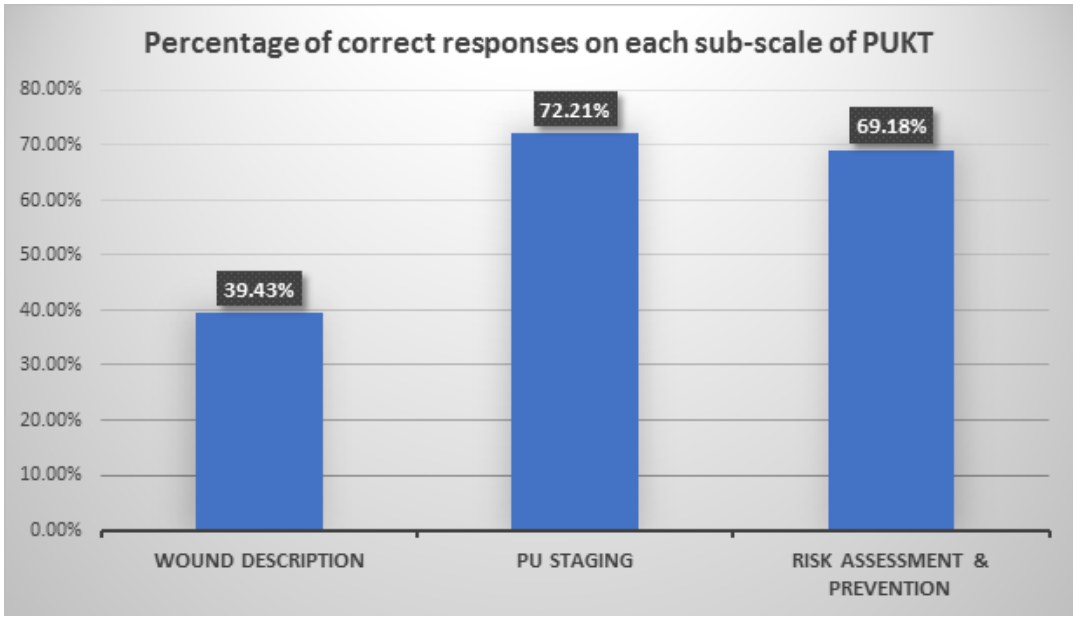

Figure 1

Discussion

The occurrence of PUs has become a universally validated indicator of quality of care in the hospital setting.[2] Despite of the availability of appropriate guidelines and modern preventative technology, a high prevalence rate of PUs in Indian hospitals is an indicator of poor quality of preventive care being provided by the healthcare professionals.[13] According to the literature, physicians and surgeons often neglect crucial matters related to wound recognition and PU care, considering it as a "nursing issue".[6] This anecdotal assertion is common among the surgical residents too, which has resulted in an inadequately prepared team with a below average knowledge to deal with PUs.

In our study, the average PUKT score for general and orthopedic surgical residents was 65.65%, which is lower than the scores of general physicians (69%) and nurses (75.0%) reported in the literature.[2,6] However, our results are consistent with the low scores of geriatric fellows (58+18%) reported from New York state.[7]

In a study by Levine et al, the authors designed a photograph based wound identification test to examine the knowledge of medical residents about PU staging. It was found that the residents faced most difficulty in identifying stage III ulcers and suspected deep tissue injury. Whereas, stage I and stage IV ulcers were correctly identified by majority of the participants. [6] Likewise, Odierna et al also reported somewhat similar results with more than half of the geriatric fellows identifying stage I and stage IV ulcers accurately.[7] In our study as well, the percentage of times that surgical residents correctly identified PU stages was 72.21%.

Kohta et al in his cross sectional survey reported a moderate level of knowledge (78.6%) among social welfare professionals about PU prevention. In his study, the repositioning schedules and pressure reducing techniques were known by 100% of the care managers.[1] On the other hand, only 67% of the geriatric fellows were aware of the role of pressure modifying surfaces in reducing the incidence of PUs.[7] Similarly, in our study, majority were not able to answer questions related to pressure reduction and minimizing shearing force. This highlights a significant knowledge deficit among clinicians as compared to the social welfare workers, thus emphasizing a need for behavior specific educational campaigns targeting residents in various surgical and medical specialties.

It is important to understand that once developed, PUs rapidly progress to an advanced stage requiring an enormous amount of time and energy for their management. Moreover, the treatment of PUs is extremely costly placing a substantial financial burden on hospitals.[14] Previous studies have shown that preventing PUs is 2.5 times cheaper than its treatment.[15] In 2008, the Centers for Medicare and Medicaid Services (CMS) published guidelines related to hospital-acquired conditions (HACs). They reported PUs as the most frequently acquired HAC. Afterwards, they refused to bear any additional charges incurred for hospital acquired ulcers. This new policy led to an intensified effort on developing strategies and action plans aiming at reducing the incidence of PUs in hospitalized patients.[16]

In addition, the incidence of PUs in Indian surgical wards is considerably higher (12-66%) than the other long-term care facilities (2.2-23.9%).[17] Current study reported an extreme lack of awareness prevailing among surgical residents about the recommended PU care. Therefore, educating surgical and orthopedic residents on this topic is of immense significance. According to the latest CMS guidelines about PUs, documentation for wound identification and staging is required by the healthcare providers and physicians.[6] Thus, in order to fulfill this task accurately, an extensive training program on risk assessment, prevention, and PU staging is required for the residents in all hospital care settings.

Few limitations of this study should be considered. Firstly, the study only determined the knowledge of surgical residents regarding PU prevention without assessing their attitude and practices which the authors plan to investigate in future. Secondly, although the sample size was small but it may represent surgical residents' knowledge in other hospitals settings of India as well.

Conclusion

Through the results of this questionnaire survey, we concluded that the current levels of knowledge regarding PU prevention among the surgical residents was "low". The authors recommend continuous education and practical training enabling the residents to intervene positively in the process to prevent and treat PUs. Moreover, specific curricular guidelines are required to improve the overall compliance with the international recommendations of PU prevention and care.

Conflict of Interest: None.

Funding Disclosure: None.

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