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Research Article

**PRESSURE ULCER ASSESSMENT SCALES: UTILITY
EFFECTIVENESS ADVANTAGES AND DISADVANTAGES**¹ Nasreen Rebecca Wilson, ² Dr. Janet Hild¹ MSc. N, BSc. N, RN, RM, DTA, Assistant Professor, Principal at School of Nursing,
Isra University, Hyderabad Sind Pakistan² Chairperson of Project Committee**Abstract:**

Objectives: The purpose of this study was to explore the percentage of nurses utilizing pressure ulcer assessments scales and examine the effectiveness, advantages and disadvantages of those scales as perceived by nurses.

Material and Methods: The present study was a survey conducted in acute-care hospitals that included nurses from all levels in order to assess the percentage of professionals using pressure ulcer assessment tools. The effectiveness of Norton, Braden, Gosnell, and Knoll was examined. Using Innovation model the state of the diffusion of the scales as innovation within the health-care system was explored, and input from users was obtained for the purpose of refining the scales for the future. A contact person at each institution was asked to randomly distribute the questionnaire to five volunteers at medical and/or orthopedic units. However, at one of the facilities that used an actual pressure ulcer assessment tool the questionnaires were given to selected nurses. All the data was recorded in the proforma.

RESULTS: A total of 45 questionnaires were delivered to nine institutions. The majority of respondents (42.2%) were from medical units. Only 8.9% were from orthopedic, which is considered a high-risk surgical area for the development of pressure ulcers. The highest number of participants was RNs (60%) and the majority of subjects (77.8%) had patient care experience of between 6 and 30 years. Nursing school was identified as the primary source of information about pressure ulcers by 23 and continuing education by 21 respondents. 28.9% experienced using pressure ulcer assessment scale(s) for the first time within the past 1 to 5 years, 26.7% within the Past 6 to 10 Years, and only 2.2% within 21 to 30 years. For the purpose of scale refinement, 20% said formal feedback on pressure ulcer scales was obtained by the CNS, wound management committee, doctor, nursing manager, Enterostomal therapy nurse, or in the staff meetings.

Conclusion: It is concluded that the use of Pressure Ulcer Assessment Scales needed to be brought in as the integrated part of nursing practice for assessing patients at risk before patients develop pressure ulcers by adapting measures to alleviate patients' suffering, shorten hospitalization and control the cost of long term treatment of this condition. The ConvaTec and Braden Scales were found more users friendly whereas the Norton scale was time consuming as experienced by the study subjects.

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INTRODUCTION:

Pressure ulcers are significant health problems typically occurring in the context of severe illness and high care dependency [1]. It may be caused by inadequate blood supply, resulting reperfusion injury when blood re-enters affected tissue. A simple example of a mild pressure sore may be experienced by healthy individuals while sitting in the same position for extended period of time. In this state a dull ache experienced by the patient on the pressure area is indicative of impeded blood flow to the affected area. Within several hours, the shortage of blood supply leads to ischemia, tissue damage and cell death [2]. Annually, 2.5 million pressure ulcers are treated in the United States in acute care facilities alone [3]. In such settings in the United States, the incidences of bedsores is 0.4% to 38%. In long-term care facilities it is 2.2% to 23.9% and in home care, it is 0% to 17%. Similarly, there is wide variation in prevalence: 10% to 18% in acute care, 2.3% to 28% in long-term care, and 0% to 29% in home care. There is a much higher rate of bedsores in intensive care units due to the patients being in immunocompromised state i.e. 8% to 40% of those in the ICU develop bedsores.⁴ Pressure ulcers are caused by prolonged mechanical loading of the soft tissues, while the detailed mechanisms remain largely unknown [5,6]. Several theories have been developed pertaining to the link between mechanical loading and tissue necrosis, including localized ischemia [7,8], sustained deformation of cells, impaired interstitial fluid flow and lymphatic drainage, and reperfusion injury [9-11]. Among these theories, local ischemia is widely accepted as the primary etiology of pressure ulcers [5,6]. The ischemia theory proposes that tissue ischemia induced by the occlusion of blood vessels by externally applied pressure causes ischemic damage of weight bearing tissues. Aligned with the ischemia theory, skin blood flow function that determines the ability of the skin in response to ischemic stress has been proposed to be a good indicator for identifying people at risk of pressure ulcers [6,8]. Common pressure sore sites include the skin over the ischial tuberosity, the sacrum, heels of feet, heads of the long bones, buttocks, shoulders, and the back of the head [12]. Pressure ulcers are a significant healthcare problem affecting the quality of life in wheelchair bounded or bed-ridden patients and are a major cost to the healthcare system [13,14]. Various assessment tools such as the Braden, Norton, Gosnell and Knoll have been developed to assess the risk of pressure ulcers in patients. These tools have provided an initial guidelines for assessing risks as a first step in the prevention of pressure ulcers. [14]. On the other hand literature identified three most commonly used

pressure ulcer risk assessment scales, the Water-low scale, the Braden scale and the Norton scale. However Waterlow scale is the most widely used risk assessment scale in the UK and Ireland [15], even though there is no evidence to suggest it is more effective than the other most commonly used scales [15]. Therefore this study was conducted to find out the utility of by nurses, effectiveness, advantages and disadvantages of these scales as experienced by nurses in the care practice.

MATERIAL AND METHODS:

The present study was a survey conducted in acute-care hospitals that included nurses from all levels in order to assess the percentage of professionals using pressure ulcer assessment tools. The effectiveness of the Norton, Braden, Gosnell, and Knoll was examined. The state of the diffusion of the scales as innovation within the health care system was explored. The input from users was obtained for the purpose of refining the scales for the future. The survey findings were analyzed using principles of the diffusion of innovations theory.

Nine acute care institutions within Fresno County (California) were identified for the survey. Four institutions were located in small towns and outlying rural settings with population ranging from 2780-189000 and other five were in cosmopolitan/urban settings with population ranging from 61500-402100.

A contact person at each institution was asked to randomly distribute the questionnaire to five volunteers at medical and/or orthopedic units. However, at one of the facilities that used an actual pressure ulcer assessment tool the questionnaires were given to selected nurses. This increased the possibility of bias because the instrument was not distributed randomly. These respondents' knowledge and experience may not permit an accurate rendering of the diffusion of scales as innovation. At another facility, the CNS contributed information as participants were completing the questionnaires, thus possibly affecting the participants' responses. Although the latter actually is an example of a means of diffusion it may not give an accurate picture of the state of diffusion within the system because the information was fed to the individuals at the time of the survey. Three institutions in the urban settings completed the survey the same day. The remaining two returned the survey within one week. In the rural areas, two institutions were sent the questionnaire via fax and these were collected in person within a week. Two other institutions had the questionnaire hand delivered and completed the same day, except for

three completed questionnaires that were returned by fax the next day because the nurses were busy and could not complete the survey right away. The survey return rate was 100%. Confidentiality of participating institutions and individuals was maintained by not mentioning names or locations and reporting bed capacity only as a range.

RESULTS:

A total of 45 questionnaires were delivered to nine institutions. Five questionnaires were distributed randomly by contact person at each institution. The return rate was 100 percent. The majority of the respondents (42.2%) were from medical units. Only 8.9% were from orthopedic, which is considered a high-risk surgical area for the development of pressure ulcer. The highest number of participants was RNs (60%) and the majority of subjects (77.8%)

had patient care experience of between 6 and 30 years. (Table 1)

Nursing school was identified as a primary source of this information by 23 of the respondents and continuing education by 21. 28.9% experienced using pressure ulcer assessment scale(s) for the first time within the past 1 to 5 years, 26.7% within the Past 6 to 10 Years, and only 2.2% within 21 to 30 years (Table 2).

Six subjects claimed previous experience in using the Norton and Braden scales, one the Knoll, and none used the Gosnell Scale (Table 3).

For the purpose of scale refinement, 20% said formal feedback on pressure ulcer scales was obtained by the CNS, wound management committee, doctor, nursing manager, Enterostomal therapy nurse, or in staff meetings. (Table 4)

Table 1. Respondent's Areas of practice, Job title, and Experience
n=45

Area of practice	Frequency	Percentage
Medical	19	42.2%
Medical and other (unspecified)	8	17.8%
Orthopedic/ Surgical	4	8.9%
Assorted*	10	22.2%
Undesignated	4	8.9%
Job Title		
RN	27	60.0%
LVN	10	22.2%
CNA*	4	8.9%
DON	2	4.4%
CNS	1	2.2%
Undesignated	1	2.2%
Experience in years		
< 1 year	2	4.4%
1-5 years	8	17.8%
6-10 years	11	24.4%
11-20 years	11	24.4%
21-30 years	13	28.9%

*ICU, Telemetry, OB/Prenatal and skilled Nursing Facility

*CAN also included 1 NA

Table 2. Source of Information and Time Frame of First use of Pressure Ulcer Assessment Scale

Source	# of Respondents
Nursing School	23
Continuing Education	21
Literature	9
Colleagues	7
Other* ¹	13
Total	73* ²
Time of First use of Pressure Ulcer Assessment Scale	
Within < 1 year	4
Within 1-5 years	13
Within 6-10 years	12
Within 11-20 years	6
Within 21-30 years	1
Not responded	9

*¹ Other sources of information were in-service, clinical practice forum, drug sales person, CNS & ET nurse.

*² More than one responses were possible

Table 3. Time required completing an Assessment Scale

Scale(s)	# of Respondents
Norton	6
Braden	6
Knoll	1
Gosnell	0
Other* ¹	4
Hospital Protocol* ²	4
Unspecified/Unknown	14
Not Responded	10
Total	45* ³

*¹ Inservice, clinical practice forum, pharmaceutical agent, CNS & ET nurse

*² Stages I-IV of Pressure ulcers.

*³ More than one response was possible

Table 4. Formal feedback on Pressure Ulcer Assessment Scales ever collected

Response	# of Respondents	Percentage
Yes	9	20.0%
No	30	66.7%
No Response	6	13.3%

DISCUSSION:

Pressure Ulcers problem prevails one among seven major clinical problems in United States (Xakellis, 1993). Prevention is not only cost effective but also a highly important ethical activity of nursing profession. Nursing care has a major impact on pressure ulcer development and prevention. Hence, the use of Pressure Ulcer Scales is the major nurse-sensitive outcome¹⁶.

Current study was aimed to explore the percentage of nurses utilizing pressure ulcer assessment scales for the early detection and prevention of pressure ulcers; the type of assessment tools they were using; and the effectiveness of those scales in terms of advantages and disadvantages as experienced by those

practitioners. A total of 45 questionnaires were delivered to nine institutions. Five questionnaires were distributed randomly by contact person at each institution. The return rate was 100 percent. The number of experience in nursing ranged between 1 to 30 years. The majority of subjects (13 out of 45) started using these tools in their nursing practice between 1 to 5 years of the career. The majority of respondents learnt about these scales initially during the 6th to 10 years of being in nursing. In this study the Nursing School was identified as a primary source of the information about the Pressure Ulcer Assessment Scales i.e. 23 out of 45 subjects who learnt about these tools during professional education while in-service Continuing Education was found to be the second highest source (21 out of 45) of this

awareness of practice. Results of this study are found consistent with Agorye I J et al¹⁸ in terms of age and experience of subjects started utilizing these scales in their career. A similar study in **Brazil** by Chianca TC et al¹⁹ also found comparable findings. On the other hand a study by Nur et al²⁰ reported that participants were asked 22 questions to assess their knowledge on pressure ulcer prevention, and they were categorized in to two groups based on their score in relation to the mean. More than half (54.4 %) of the respondents were found to have good knowledge, while a substantial proportion (45.6 %) of the respondents did not.

In this study the Braden and Norton were the commonest pressure ulcer assessment scales. However, the ConvaTec scale provided by the pharmaceutical company along with the Braden scale, were found to be the most user friendly tools. According to a Bangladesh study results showed that the knowledge about the use of risk assessment scale for pressure ulcers was as low as 12.1%²¹. Although our study shows slightly increase rate of the utility and knowledge regarding the use of scales compared to the study of Bangladesh, but there still is a need to enhance the diffusion of this innovative tool into nursing education system as well as in to clinical care activity. In the comparison of this study Agorye IJ et al¹⁸ reported that the assessment scales used by nurses revealed that the respondents with knowledge of assessment scales were able to predict risks of pressure ulcers such as Braden scale 33 (36.3%); Waterlow Scale 22 (24.2%); and Norton scale 18 (19.8) while 11 (12.1%) identified Knoll and 2 (2.2%) Gosnell scales. The findings of this study was correlated to the study by Vanderwee et al.²² which revealed that 18 out of 78 nurses had no official training on pressure ulcer prevention, and that 43 nurses did not know how to use risk assessment scales. In the study of Šateková L et al²³ reported that best predictive validity values, with little differences, were observed for the Braden Scale, followed by the Norton Scale and the Waterlow Scale, in that order.

CONCLUSION:

It was concluded that the least time required for completing an assessment scale was of the ConvaTec and the next was of the Braden scale. The average time required for these two scales was between less than 1 to 5 minutes. Whereas the longest time needed was for the Norton scale averaging from 10 to 30 minutes. Useful information for possible refinement and need to make pressure ulcer assessment scales an integrated part of nursing assessment activity at all levels in clinical areas. The author concludes that

these scales/tools to be reviewed and refined every 3 to 5 years for the effectiveness of nurses' activities in patient care and for time saving and usability. It is suggests a further study on the language of responses of scales that create the perception of the assessor in terms of clarity and completion time with accuracy.

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