

Original article

Evaluation of the Braden Scale Implementation by nurses: A Case Study in a Specialized Hospital in the Dhaka City.

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Abstract:

Objective: The aim of this routine to research (R to R) developmental study was to implement the Braden Scale (BS) to identify risks of pressure ulcer (PU) development among hospitalized patients with spinal cord injury admitted in National Institute of Traumatology and Orthopedic Rehabilitation (NITOR), Bangladesh. **Methods:** Roger's Diffusion of Innovation Theory and PU related literature were used to guide the development of the implementation. The subjects were 10 nurses and 13 doctors who were working at the NITOR. Different strategies were provided for the implementation of the BS including workshops to provide knowledge, persuasion, and decision making to implement the BS for the nurse participants. The outcomes of this study were to determine: (a) nurses' adoption in terms of the rate of using the BS and the accuracy of using the BS to identify PU risks, (b) nurses' satisfaction to use the BS, and (c) doctors' satisfaction on the implication of the BS to identify the risks of PUs in hospitalized adult patients with paraplegia. Data were analyzed by descriptive statistics and percentage of agreement. **Results:** Weekly proportions of nurses' adoption in terms of the rate of using the BS ranged from 96% to 100%. The accuracy of using the BS yielded percentage of agreement between 70.6% to 100% for each item of the BS. Nurses' and doctors' satisfactions were at very high levels. Mean score of nurses' satisfaction was 98.5% (SD=1.23) and mean score of doctors' satisfaction was 89.79% (SD=4.17). **Conclusion:** Nurses are capable to assess PU risks of paraplegic patients independently by using the BS and may be incorporated to identify PU risks in addition to their work protocol. After identifying the PU risks, effective nursing care should be implemented to the patients in order to prevent the PU formation.

Keywords: pressure ulcer, Braden Scale, risk assessment tool, Roger's Diffusion of Innovation Theory, spinal cord injury

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Introduction:

Pressure Ulcer (PU) is one of the major concerns in assuring health care for prolonged bed ridden patients all over the world including Bangladesh. Pressure Ulcer (PU) causes great suffering and brings frustration to the patients, their family members and caregivers involved¹. Millions of patients are hospitalized worldwide². Patients with spinal cord injury (SCI) are considered as "paraplegic"

among several groups of patients suffer from PU during hospitalization and after being bed-ridden at home³. It has been observed that in acute stage, 21% to 37% of patients with SCI developed PU and 15 % to 30 % in chronic stage of this illness trajectory⁴. Report from Bangladesh demonstrated that among 247 paralyzed patients 94 (38%) developed PU⁵. PU is known to severely affecting recovery and incurring additional costs in treating these patients.

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Identification of risks is found to be an important to prevent PU⁶. The widely use assessment tool for identifying PU risk is the Braden Scale (BS) which was introduced in nursing research since 1987⁷. It has been found to be predictive and valid tool to identify PU risks demonstrating the best balance between sensitivity and specificity⁸. A recent study demonstrated that the knowledge of nurses is severely limited regarding the use of tools to assess PU risk in which only 12% of nurses had the required knowledge of using the PU screen tool⁹. With this regard, the study was aimed to explore situation in training nursing staffs in assessing risk of development of pressure ulcer by using Braden Scale and adopt in nursing practice in Bangladesh to improve healthcare for long term bed ridden patients.

Materials and Methods:

Study design and research protocol

A routine to research (R to R) protocol was designed to implement the BS to identify risks of PU formation among hospitalized spinal cord injury patients. The National Institute of Traumatology and Orthopedic Rehabilitation (NITOR) were selected as the place of study. The study was approved by the Research Ethics Committee of Faculty of Nursing, Prince of Songkla University, Thailand and the Director of National Institute of Traumatology & Orthopedic Rehabilitation (NITOR) in Bangladesh. All the 10 nurses and 13 doctors working in the paraplegic ward participated in the study. Rogers's theory of Diffusion of Innovations¹⁰ and PU related literature were used to guide the development of the implementation of BS to assess PU risk in context of Bangladesh healthcare. Four elements of the Diffusion of Innovation Theory were adopted to guide the implementation of the BS, which are new things in the context of Bangladesh. Those elements are innovation, communication channels, time, and social system. Number of different strategies provided for the implementation of the BS including strategies to provide knowledge, persuasion, and decision making to implement the BS for the adopters.

All 10 nurses participated in a one-day workshop conducted by the researcher and the expert doctor in this filed. The workshop discussed about Braden Scale and its interpretation, usefulness and the demonstration of application of the BS on a patient with spinal cord injury. In addition to the participants the Hospital Director, doctors, the Nursing Superintendent, and the Ward in-charge also attend-

ed the workshops. The attendance of the authorized persons was aimed to ensure the proposed study plan is known by the hospital management. Following completion of the Workshop the nurses were asked to use the BS tool on the patients admitted in the paraplegic ward for 2-month. The implementation of the BS was started on the first day and the fourth day of admission and continued weekly for the next 7 weeks or until a patient has been discharged. The documentation of skill and accuracy of use of the BS scoring was produced during the 2-month of the implementation phase. The nurses' and doctors' satisfaction were evaluated at the last week of the 2-month of study period.

Data collection

The outcome of this study was the nurses' skill to the use of the BS, nurses' and doctors' satisfaction. Nurses' adoption was indicated by two ways: The first indicator is the rate of using the BS as evaluated by checking on documentation adoption- the percentage of patients been assessed and documented by nurses using the BS. This data were collected by Chart Audits on a weekly basis using the BS Audit Form. A proportion of at least 50% of patients being assessed by the BS during a two month period was considered as successful nurses' adoption. The second indicator was the accuracy of adoption, which was the accuracy of the application of the BS to assess the PU risks. It is measured by comparing the percentage of accurately identified PU risks based on the six dimensions (sensory perception, moisture, activity, mobility, nutrition, friction and shear) with that of the researcher. The successful accuracy of adoption is considered when there was at least 50% of agreement in the six items of the BS compared between the nurses and the researcher.

Nurses' satisfaction was evaluated by Nurses' Satisfaction Questionnaire (NSQ) that was modified from the Satisfaction of Implementation of Pain Guideline Management in Patients admitted in the Intensive Care Unit (developed by Kanitta Chamlai, Personal communication). It was consisted of 12 items with use of a five-point Likert-scale. The scores ranged from 12 to 60 and it was transformed to percentage. The score "1" indicated no satisfaction at all and the score "5" indicated the extreme satisfaction on using the BS tool. The higher scores of the NSQ indicated the higher level of nurses' satisfaction on using the BS. The NSQ scores were categorized into four levels as low, moderate, high, and very high satisfaction.

Doctors' satisfaction was evaluated by the Doctors'

Satisfaction Regarding the BS Questionnaire Implementation (DSQ). The DSQ was designed to get feeling of satisfaction when nurses assessed PU risk on their patients by using the BS. Doctor Satisfaction Questionnaire (DSQ) composed of 11 items with the five-point Likert-scale. The scores ranges from 11 to 55 and it were transformed into percentage. The DSQ was categorized into four levels as low, moderate, high, and very high satisfaction.

The validity of the questionnaire were assessed by three experts, two of them were nursing administers and experienced researchers from the Faculty of Nursing, Prince of Songkla University and , the third expert was a physician who has expertise on PU prevention and treatment in a Bangladeshi Hospital. The reliability of the NSQ was tested with all 10 nurses yielded a Conbach Alpha Coefficient of 0.16. The reliability using Conbach Alpha Coefficient of the DSQ with 13 doctors-subjects was 0.51. The Braden Scale Record Audit Form was tested by the inter-rater reliability with 20 patients in the Prince of Songkla University PSU hospital, Thailand. The inter-rater reliability yielded a Pearson Correlation Coefficient of 0.98.

Statistical analysis

Data were analyzed by using descriptive statistics for frequency, percentage, mean, median, and standard deviation.

Results:

Nurses' characteristics

The median age of the nurses was 40.10 years old (IQR=7.25 years old). All nurse participants were female and had a Diploma Degree in Nursing. Only three of them had formal training on pressure ulcer care. The median of the service experience of the nurses was 13.50 years (IQR=11.25 years). The length of nursing experience of the participants in working in this paraplegic ward was a minimum of one year and a maximum of 10 years with a median of 2.5 years (IQR=2.25).

Doctors' characteristics

The median age of the doctors was 38.0 years old (IQR=7 years old). All doctors were male and most of them had a Master of Surgery (Orthopedic) Degree. Only two of them had formal training in pressure ulcer care. The median service experience was 9 years (IQR=7.00). The median length of working experience in a paraplegic ward was 2.60 years (IQR=1.50).

Patients' characteristics

One hundred and nineteen patients were assessed by all nurses during the data collection period. The mean (\pm SD) age of the patients was 36.67 ± 1.22 years old. Most of the patients (n=100) were male. Usually, one nurse assessed PU risks with the BS on an average of 6 to 27 patients over the two months of study period.

The study outcomes

Weekly nurses' adoption in terms of the rate of using the BS ranged from 96% to 100%. The accuracy of using the BS yielded percentage of agreement between 70.6%-100% for each item of the BS. Nurses' and doctors' satisfactions were at very high levels. Nurses' satisfaction range was 96.67% to 100% with the mean (\pm SD) of $98.5 \pm 1.23\%$. Doctor's satisfaction range was 83.64% to 100% with the mean of $89.79 \pm 4.17\%$.

Discussion:

This study showed that nurses' adoption rate of using the BS was at very high rate. In addition the accuracy of using the BS was greater than 70%. Both nurses and doctors' satisfaction were also at very high levels. The findings of this study supported the Rogers's Diffusion of Innovation Theory¹⁰. The high adoption rate of using the BS as the innovation was related to the adoption process of innovation, which includes knowledge, persuasion, and decision process. The workshop, phemphet, demonstration, patient's participation with pressure ulcer suffering, two-way communication between the research and the nurses, and closed supervision of the researcher were crucial methods to increase the high adoption rate of using the BS. In addition, interpersonal communication was maintained with the nurses as interpersonal channels was the greatest and more powerful tools for creating or promoting positive attitudes to adoption of innovation¹⁰⁻¹². Coaching as well as the 2-month time period were crucial factors to promote the rate of the nurses' adoption of using the BS, as time was an important element in developing awareness and promoting adoption^{10,13}. Appropriate training and coaching could persuade nurses to have a positive attitude towards pressure ulcer prevention leading to a change in nursing care practice¹². Moreover, Agreement of the authorized persons in this study hospital including the hospital director, joint director, deputy director, nursing superintendent was also an important element in the diffusion process. Previous study showed that support administrators

as a social system could have a significant consequence on an adoption decision¹⁰. All of these proposed process influenced the high accuracy rate of using the BS by nurses, ultimately, leading to the very high rate of satisfactions both nurses and doctors.

Conclusion:

The study showed that nurses' adoption in terms of rate of using the BS, and accuracy of using the BS to identify PU risk marked excellence. Nurses 'satisfaction level showed high concordance with that of the doctors' satisfaction and are capable of assessing PU risks of paraplegic patients independently by using this scale.

The strength of this study is that it provides the practice knowledge that has a theoretical-based foundation with the R to R design into the Bangladesh context. The study demonstrated that implementation of BS by nurses is feasible and would possibly a cost effective tool to evaluate risk for PU formation of paraplegic patients in Bangladesh.

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