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Article

ISSUES AND CHALLENGES IN IMPLEMENTING BRADEN SCALE TO ASSESS PRESSURE INJURY RISK: A PARTICIPATORY ACTION RESEARCH IN SOUTH-EASTERN INDONESIA

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ABSTRACT

Background. Pressure injury (PI) is chronic wound over bony prominence that should be managed to avoid morbidity and increased costs. Braden scale (BS) has been used worldwide for almost forty years as PI's standard risk assessment tool. This study aimed to identify issues among nurses regarding the implementation of the PI risk assessment tool in a referral hospital in rural Indonesia.
Methods. We performed two cycles of participatory action research (PAR) to initiate the BS implementation and to establish follow-ups accordingly in inpatient units. The PAR ensured the active roles of the 12 nurses and midwives who initially implemented the tool. The transcribed focused-group discussion (FGD) recordings were analysed following six steps of thematic analysis.
Results. There were three main themes emerged. The themes were the nurses' understanding of the need for PI risk assessment, the increasing workload when implementing PI risk assessment, and the importance of the primary nurse role. The themes reflects the need for nurse practitioners to further implement the tool by seeking confirmation from the primary nurse's group. The ease and trialability of the BS enhanced the nurses' compliance with the new tool. The nurse manager and leader needed to concentrate on perceived innovation attributes to implement the PI risk assessment tool further.
Conclusion. The PAR cycles have recruited early adopters and suggested implementing BS to assess PI risk. The role of hospital managers and leaders in ensuring continuity of implementation is crucial.

Keywords: *Pressure injury; Healthcare research; Nursing assessment*

Latar Belakang: Pressure injury (PI) atau jejas tekan merupakan luka kronis yang terjadi pada area prominens tulang dan harus dikelola dengan baik untuk mencegah morbiditas serta meningkatkan efisiensi biaya perawatan. Braden Scale (BS) telah digunakan secara luas selama hampir empat dekade sebagai alat standar untuk menilai risiko PI. Penelitian ini bertujuan untuk mengidentifikasi permasalahan yang dihadapi perawat dalam implementasi alat penilaian risiko PI di sebuah rumah sakit rujukan di daerah selain di kota besar.
Metode: Penelitian ini menggunakan dua siklus Participatory Action Research (PAR) untuk menginisiasi implementasi BS serta melakukan tindak lanjut di unit rawat inap. Pendekatan PAR memastikan peran aktif 12 perawat dan bidan yang pertama kali menerapkan alat ini. Rekaman hasil Focus Group Discussion (FGD) ditranskripsi dan dianalisis menggunakan enam langkah analisis tematik.
Hasil: Tiga tema utama muncul dalam penelitian ini, yaitu: pemahaman perawat tentang pentingnya penilaian risiko PI, peningkatan beban kerja dalam pelaksanaan penilaian risiko PI, serta pentingnya peran perawat primer. Tema-tema ini mencerminkan perlunya perawat klinis untuk mengimplementasikan alat penilaian lebih lanjut dengan meminta konfirmasi dari kelompok perawat primer. Kemudahan penggunaan dan kemungkinan uji coba BS meningkatkan kepatuhan perawat dalam menerapkan alat baru ini. Manajer dan pemimpin perawat perlu berfokus pada persepsi inovasi untuk mendukung implementasi alat penilaian risiko PI secara berkelanjutan.
Kesimpulan: Siklus PAR telah berhasil merekrut perawat sebagai early adopters dan menunjukkan bahwa implementasi BS dalam penilaian risiko PI dapat diterapkan dengan baik. Peran manajer dan pemimpin rumah sakit sangat penting dalam memastikan kesinambungan implementasi alat ini.

Kata Kunci: *Jejas Tekan; Penelitian Kesehatan; Asesmen Keperawatan*

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INTRODUCTION

Pressure injury (PI) was formerly known as pressure sores, ulcers, and decubitus ulcers. The term "pressure injury" is defined best as the injury from bony pressure, excess moisture, and shear that results in a wound and other forms of injury, such as permanent redness (1–3). External pressure above the capillary pressure (12-32 mmHg) impairs perfusion and induces tissue ischemia. Inflammation, edema, and infection aggravate the development of wounds in the ischemic tissue. The process starts from the muscle and reaches the skin through all the soft tissue in between.

Patients with impaired mobility are at greater risk of developing pressure injury. A stroke unit in Indonesia reported a pressure injury risk of 28% for all stages compared to all inpatients risk of 12,2-20.3% (2). Pressure injury rate reflects morbidity at the individual patient level and substantially portrays problems in hospital quality (4). Agency for Healthcare Research and Quality has long included pressure injury rate measurement as a quality and patient safety indicator (5), which underlined the importance of managing pressure injury risk from the view of patients, caregivers, and hospital management.

Shifting from a service paradigm to a safety paradigm requires time and investment. However, this change will increase quality and potentially save enormous service costs. An intensive care unit in Newcastle reported a thorough study, and in four years, the pressure injury rate dropped 63%, saving an estimated cost of 2.6 million pound sterling (6).

Implementing a reliable assessment tool is the first step in managing PI risk. The Braden scale (BS) has been used for over four decades worldwide for its comprehensive and easy-to-use features (7,8). This tool employs scores of one to four in six risk factors: sensory perception, moisture, activity, mobility, nutrition, and shear and friction.

Currently, the Ministry of Health prioritises cancer, cardiovascular, stroke, and urology services, which have high PI risk. Consequently, risk assessment and implementation of PI prevention must be carried out because it is important to prevent morbidity in the community served and to avoid increased healthcare costs due to prolonged hospitalisation. Improving the quality of hospital services impacts hospital efficiency and the quality of life of the patients and community being treated in hospitals.

Our provincial general hospital provides referral services from all over the province and directly serves the community in the provincial capital city. The hospital has not yet implemented BS as a PI assessment tool. This study aimed to describe and explain the issues and challenges in implementing BS in a referral hospital with complex services. We hope that identifying the issues emerging from this research will help the hospital improve quality and serve as a learning resource for other hospitals looking to implement BS.

METHOD

This study was a participatory action research (PAR) study. The PAR method is a research approach involving community members in generating new knowledge while fostering social change. In other words, the experience of an event or intervention becomes material for reflection to initiate a new intervention—simply put, learning by doing (9–11). In healthcare services, PAR was widely practised in Latin America, particularly in Brazil, and covers both healthcare services and the community level (12).

This participatory action research addressed the main research question: What issues arise in implementing the BS in inpatient units, and what solutions could be proposed?

Classically, PAR has four key principles and four components in one cycle. The four key principles were expertise in direct experience, knowledge in action, research as a transformative process, and collaboration through dialogue (9). The four components consist of defining the problem, implementing the intervention, observing the intervention, and reflecting on the overall experience to redefine the problem (9). The redefinition of the problem was followed by a new intervention, and so on, for the second cycle. Thus, PAR could be continued cycle after cycle.

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All the authors brought relevant expertise to the study. As the lead researcher, the first author has a master's degree in tropical medicine and is a medical doctor. The second author, a specialist plastic reconstructive & aesthetic surgeon at the study's hospital, facilitated communication with the participants. The third and fifth authors contributed with their extensive backgrounds in medical science, education, and medical doctors. The fourth author, a social and community psychology lecturer at Universitas Nusa Cendana with expertise in qualitative research, primarily facilitated the focus group discussions (FGDs) and supported by the other authors. The research team comprised one female and four male researchers, bringing a diverse perspective to the study.

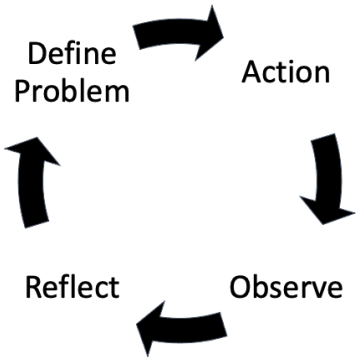

Figure 1. The four components of the PAR cycle (9).

At the time of the study, all authors were lecturers at Universitas Nusa Cendana, Indonesia. The second author's dual role as the hospital doctor allowed smoother access and collaboration with participants. The participants: head nurses, primary nurses, midwives, and associate nurses, were informed during the initial group discussion about the study's objectives. The authors emphasised the collaborative nature of the study, fostering an open, safe, and non-judgmental environment to promote cross-professional dialogue to minimise subjective bias. This participatory approach ensured active engagement and contributed to the success of the research process.

In this study, we conducted two cycles of intervention and discussion. The intervention to implement was using BS to assess pressure injury risk among the newly admitted inpatients in six inpatient units (IU). The IUs were two intensive care units, three general medical and surgical wards, and one obstetrics-gynaecology ward. The hospital management appointed two participants purposively from each IU at the researchers' request, and the inclusion and exclusion criteria were applied. Participants were included if they were either head nurses, primary nurses, primary midwives, associate nurses, or associate midwives and excluded if they rejected to be participants. Each participant signed an informed consent to be a research subject.

The head nurse held the highest leadership position within IU and coordinated both managerial and clinical aspects. The primary nurse with specific educational qualifications, ensured that the entire nursing care process—from assessment, diagnosis, intervention planning, implementation, to evaluation—was conducted per established standards. The primary nurse also assumed responsibility for a single patient throughout the continuum of care, from admission to discharge. Meanwhile, the associate nurse or associate midwife provided nursing or midwifery care in alignment with the care plans developed by the primary nurse, adhering to the respective standards of care.

Before, between, and after the two cycles, we gathered with the nurses and midwives in FGDs to discuss issues in implementing the Braden Scale. In the opening of the first FGD, the researchers reintroduced the pressure injury term in relation to service quality, patient safety, and hospital burden. The FGDs were conducted in a hospital meeting room for three hours each.

Thematic analysis (13), which has six steps and is summarised in Table 1, guided qualitative data analysis from the FGD transcripts.

Data saturation was indeed considered during the thematic analysis process. Data saturation refers to the point at which no new themes, insights, or information emerge from the data, meaning further data collection would likely not provide additional meaningful contributions to the analysis. We assessed data saturation through the FGDs. After conducting three FGDs, the research team noted that no new significant issues, themes, or perspectives were introduced in the second cycle, indicating that data saturation had been achieved. Consequently, no further FGDs were conducted after this point, as it was determined that additional discussions would not yield new insights relevant to the research question.

A focus group discussion guide was prepared in advance to ensure consistency and focus during the discussions. The guide was

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specifically designed to explore the process of implementing the BS to assess pressure injury risk in the hospital. The aim was to gather in-depth insights into the challenges, successes, and potential areas for improvement in using the BS across the six inpatient units. However, no formal pilot testing of the FGD guide was conducted before the discussions. Instead, the guide was developed based on the research objectives and prior knowledge of the BS implementation issues. The questions were structured to encourage open dialogue and reflection among the participants, ensuring that all relevant aspects of the implementation process were thoroughly discussed.

Table 1. Six steps of thematic analysis (13).

No.	Step	Description
1.	Familiarising yourself with your data	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas
2.	Generating initial codes	Coding interesting features of the data systematically across the entire data set, collating data relevant to each code.
3.	Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme
4.	Reviewing themes	Checking if the themes work suitable with the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5.	Defining and naming themes	An ongoing analysis was needed to refine the specifics of each theme and the overall story the analysis told, generating clear definitions and names for each theme.
6.	Producing the report	This step is the final opportunity for analysis: selection of vivid, compelling extract examples, final analysis of selected extracts, relating the analysis to the research question and literature, and producing a scholarly report of the analysis.

We were involved in coding and analysing the focus group discussion data. The coding process was conducted collaboratively, with the coders independently reviewing the transcripts and identifying initial codes. After this initial coding phase, the coders met to compare their findings, discuss discrepancies, and reach a consensus on the final coding framework. This iterative process enhanced the reliability of the coding and ensured that multiple perspectives were considered in the analysis.

The themes identified in this study emerged organically from the data during the analysis process. Rather than being predefined based on existing literature or theories, the themes were developed through a careful examination of the focus group discussion transcripts. The iterative coding process allowed the researchers to capture the participants' perspectives and experiences regarding implementing the Braden Scale for assessing pressure injury risk.

The research team discussed the findings with the participating nurses to ensure that the interpretations and themes derived from the data accurately reflected their contributions and experiences. This collaborative approach allowed for clarifications and confirmations of the key findings, enhancing the credibility of the data analysis process. This method of involving the participating nurses in discussing the findings validated the themes identified during the analysis, fostering a sense of ownership and ensuring their insights were accurately represented.

This report is written following the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines (14) to ensure transparency and clarity in qualitative research reporting. COREQ provides a systematic framework for presenting essential information related to the research context, data collection processes, analysis, and interpretation of findings. By adhering to COREQ criteria, this report aims to provide a comprehensive overview of the methodologies employed, participant characteristics, and decision-making processes in the research. This approach enhances the report's credibility and enables readers to clearly understand how the research was conducted and how conclusions can be drawn from the data obtained.

This PAR recruited 12 female nurses and midwives, with a mean age of 40.83 (□5.92) years. Six participants were the head nurse of each IU, while the rest were three primary nurses, two associate nurses, and an associate midwife (Table 2).

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Table 2. Study participants.

Code	Unit	Role	Sex	Age (y.o.)
A01	Male Medical – Surgical Ward	Head nurse	Female	45
A02	Male Medical – Surgical Ward	Primary nurse	Female	35
B01	Medical – Surgical Ward	Head nurse	Female	44
B02	Medical – Surgical Ward	Primary nurse	Female	36
C01	Intensive Care Unit	Head nurse	Female	47
C02	Intensive Care Unit	Associate nurse	Female	38
D01	Oncology – Gynecology Ward	Head nurse	Female	49
D02	Oncology – Gynecology Ward	Associate midwife	Female	36
E01	Intensive Cardiovascular Care Unit	Head nurse	Female	51
E02	Intensive Cardiovascular Care Unit	Associate nurse	Female	37
F01	Female Medical– Surgical Ward	Head nurse	Female	39
F02	Female Medical– Surgical Ward	Primary nurse	Female	36

The group comprised six head nurses, three primary nurses, two associate nurses, and one associate midwife. These participants were drawn from various inpatient units, including two intensive care units, three general medical-surgical wards, and one obstetrics-gynaecology ward. The head nurses represented the leadership roles within their respective units. In contrast, the primary nurses were responsible for the overall nursing care process, and the associate nurses and midwives provided care according to the care plans. This diverse yet experienced group ensured that the study captured insights from different levels of nursing practice and responsibilities across multiple healthcare units.

RESULTS

Through thematic analysis, there were three themes in the PAR. Each of the themes is presented below.

Theme 1: The Nurses Understand the Benefit of the Braden Scale

Throughout the FGDs, nurses consistently expressed their understanding of the benefits of using the BS to assess PIs. They shared insights from their clinical experiences, emphasising that pressure ulcers not only causes patients pain but also lead to longer hospital stays and increased healthcare costs.

In the discussion session of the first FGD and subsequent meetings, nurses expressed their assessment of the benefits of using the BS for PI assessment several times. Nurses could also elaborate on their previous clinical experiences with knowledge about the context of the benefits of PI assessment. An example was the statement of one of the nurses as follows.

> "… if it had already become a pressure ulcer or injury, it caused pain, and sometimes they did not want to mobilise because of that pain, or it could be the other way around. Both of these can increase the length of hospital stay and cost." (Subject A01)

Important risk factors contributing to pressure injuries can be recognised by nurses in the context of daily care. During the discussion, nurses mentioned issues related to pressure injury risks. These risks were also discussed in the context of their experiences in caring for and encountering cases in their respective wards. For instance, they noted the challenges faced by patients on ventilators, who often experience difficulties with mobilisation, contributing to moisture and friction, both heightening the risk of pressure injuries. Some nurses highlighted instances where patients preferred remaining in a single position due to pain, complicating mobilisation efforts.

> "For example, patients who used ventilators, especially, . . . they had issues with mobilisation, which also contributed to moisture and the occurrence of pressure injuries, and then friction or shear forces also caused problems…" (Subject C01)

> "… some patients ended up with decubitus ulcers because the patients themselves felt very painful and comfortable only in that

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position. It became a challenge for us because when we needed to mobilise them to the left side, they did not want to. They were comfortable only in that position." (Subject F01)

Nurses were also aware that pressure injuries can impose a burden. During the discussion, statements emerged supporting nurses' understanding that pressure injuries increased healthcare costs and the volume of care required for both nurses and families. This perspective was reflected in the statements below.

"… if there was a pressure injury, the care will be prolonged, which will incur costs and will also place a workload burden on the caregivers." (Subject A02)

The discussion also revealed that, although the risk of pressure injuries had not been analysed objectively, it had become a concern for nurses. Nurses expressed this concern as a confirmation of the need for this subjective assessment to be improved in an objective and structured manner. This concern was also evident in the communication between nurses and families during the patient discharge planning. Nurses recognised that monitoring should primarily involve their efforts, while family engagement is crucial for prevention, particularly during patient discharge. They expressed the need to educate families about patient care, such as repositioning and nutrition, especially for patients with specific conditions such as stroke.

"For monitoring, it had to be done by the nurses themselves, while for prevention, we could involve the family." (Subject B02)

"… we needed to teach the family more; family involvement was the most important when discussing patients being discharged home. Turning the patient to the right or left and the patient's nutrition, especially for stroke patients who were usually discharged with a nasogastric tube, should be taught to the family." (Subject F02)

The objective findings above reinforced the first theme that nurses understood the need for a structured pressure injuries risk assessment. Nurses recognised this assessment as part of the nursing care process, not only for patients but also involving the patients' families.

Theme 2: Implementation of Braden Scale Increased Workload.

Pressure injury risk assessment had not yet been routinely implemented at the hospital. When a new patient was admitted to the inpatient ward, the nurse performed a functional status assessment to evaluate the patient's dependency status using the Katz Index or Barthel Index in the initial nursing assessment. This functional status assessment was used by nurses to determine the level of patient dependency, which helped in workload distribution and deciding how much the family needed to be involved in patient care in the ward.

"… only for patients with high risk, determined by the level of patient dependency, according to the patient's needs, which has been managed based on their needs." (Subject E01)

Despite recognising the importance of pressure injury risk assessment, nurses perceived it as an additional burden to their already demanding schedule. They expressed concerns about balancing this new assessment with their existing responsibilities. After trialling the pressure injury risk assessment, nurses perceived this assessment as an additional workload. Nevertheless, nurses remain convinced of its importance. Hence, the discussion continued to focus on what contributed to this additional burden and what could be done to mitigate the extra workload.

"This added to the workload, but it must be done…" (All subjects)

"Because there were times when we should be performing other tasks or actions, but instead, we ended up adding to our workload by evaluating pressure injuries." (Subject C02)

The workload in this theme consists of two main components: the consequences of monitoring patients following the pressure injury risk assessment and the technical difficulties of completing it. Additionally, there were concerns among the nurses about the consistency of

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perceptions among implementing nurses regarding the completion of the pressure injury risk assessment.

> "… what we need to agree on is how we all wanted to analyse with a unified perception, especially for scores 2, 3, and 4. Otherwise, everyone will have their perception, and nurses are unique in that they can interpret things in various ways." (Subject B02)

Among the six components of the Braden Scale, the greatest difficulties for nurses were assessing the risk of moisture and nutrition. Despite brief explanations for the four risk score levels in each section, nurses still found it challenging to make selections. Nurses perceived difficulties determining the risk levels in these two categories as an additional burden.

> "… we can ask the family for their input so that we could determine the score to assign. For moisture, the scores we might get could be only 1 or 4." (Subject F02)

> "Also, if the patient was fed through an NGT and the NGT was compromised, that indicated potentially poor intake. We needed to standardise our perception on this…" (Subject C02)

The extensive discussion among FGD participants to determine a uniform method for completing the pressure injury risk assessment indicated that the nurses' uneven knowledge and skills in filling out the assessment added a significant burden to the smooth execution of daily nursing care activities. The focus group discussions highlighted that nurses' varying knowledge and skills regarding the Braden Scale significantly impeded the efficient execution of daily nursing care.

Theme 3: The Role of the Primary Nurse in the Feasibility of the Braden Scale

The discussions highlighted the critical role of nurses in monitoring patients' pressure injury risk after conducting the BS assessment. There was a lengthy and interesting discussion on how nurses handled the follow-up of patient monitoring concerning the level of pressure injury risk obtained from the risk assessment. For patients with high and very high risk, three observations were required during the night shift and two observations each during the morning and afternoon shifts.

Despite some challenges, nurses recognised the potential for implementing the pressure injury risk assessment into the initial nursing evaluation for inpatient care, moving from subjective to more objective measures. Nevertheless, nurses were confident that the pressure injury risk assessment could be integrated into the initial nursing assessment for inpatient care. The assessment, previously subjective and supported by functional status measurements, has become more objective, as reflected in the following statement."

> "With this form, we were finally organised in consistently monitoring the patient's skin condition; there was regularity and increased awareness." (Subject E02)

In subsequent discussions, despite some complaints about the technical aspects of completing the pressure injury risk assessment and how to follow up on it, the nurses intended for the primary nurse to use their authority within the service hierarchy to intervene in the technical aspects of completing the pressure injury risk assessment and its follow-up. Nurses highlighted the importance of the primary nurse using their authority within the nursing hierarchy to facilitate the effective implementation and follow-up of the risk assessment. Since associate nurses operated without direct supervision during the shifts, the leadership of the primary nurse was crucial for managing the increased workload.

First, the nurses discussed who would be responsible for follow-up monitoring of pressure injury risk during the afternoon and night shifts. During these shifts, all nursing care activities were carried out by associate nurses without supervision. Primary and head nurse managing roles were only available in the morning shift. So, they expressed the need to regulate staff based on their physical fitness and competence to distribute the perceived additional workload. Associate nurses do not have the authority to manage staffing, so this discussion indicated a desire for intervention from decision-makers in the IU setting.

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> "and also regarding the workload, we should consider the age of the workers; perhaps it could be assigned to colleagues who were in their productive years." (Subject A02)

Second, the nurses had a lengthy and serious discussion about when and how follow-up should be conducted. Many nurses felt the primary nurse should write the monitoring schedule and its follow-up on the assessment form.

> "If possible, the schedule should include specific times so that we adhere strictly to them and nothing is overlooked." (Subject A02)

On the other hand, a large group of others disagreed and preferred more flexible monitoring intervals. In other words, the nurses preferred to fill in the assessment and follow-up time on the form by themselves based on the intervals mandated by the BS.

> "So maybe the time isn't set during handover, but we write down the times ourselves. The point is that there is an evaluation, but the standards specify how often we need to evaluate. We are given intervals for evaluation, so we write down the times ourselves, rather than having them predetermined." (Subject D01)

The debate about how follow-up should be conducted ended when the head nurse, who happened to be one of the nurses participating in the discussion, shared her experience.

> "For high and very high-risk patients, I usually set the times… then I just need to monitor, and the primary nurse will review it the next day." (Subject F01)

After the discussion reached the above statement, the discussion leader recognised the need for an alternative resolution by asking whether the timeliness of follow-up monitoring should be determined separately by the primary nurse based on the general guidelines in the original pressure injury risk assessment form. The discussion concluded that regardless of the initial assessment time, the primary nurse will determine the specific follow-up time based on the BS intervals.

This engaging discussion emphasised that the successful implementation of the pressure injury risk assessment was heavily dependent on the primary nurse's role. The dynamics of the discussion on this matter outlined the theme that the feasibility of implementing the pressure injury risk assessment was closely tied to the role of the nurse in charge of care. This role was crucial for clinical decisions, such as determining when risk monitoring should occur outside the morning shift and who should perform the assessment. It was clear that leadership within the nursing hierarchy was essential in this regard. Their leadership and decision-making were critical, highlighting the significance of hierarchical support in clinical care.

DISCUSSION

This study aims to describe and explain the issues and challenges in initially implementing BS in a referral hospital with complex services. The authors extracted three important messages from the BS initial implementation: the nurses understood the BS benefits, but it was perceived as additional workload, and the primary nurse's role in care is critical in the leadership toward implementing changes.

A systematic review found that comprehensive interventions involving paradigm shifts among healthcare workers and the development of supportive systems are key to successful cultural change, including quality improvement (15). More specifically, several important steps are needed to enhance quality, including raising awareness of the problem, exploring alternative solutions, data collection, clinical leadership, and ensuring the sustainability of interventions (16).

Managing pressure injuries can be seen as an effort to improve quality, thus requiring a professional and measured approach by service providers. The Braden Scale's use as a tool for assessing pressure injury risk needs to be accompanied by appropriate nursing assessments so that the results of this risk assessment can effectively be used to prevent or reduce the risk of pressure injuries (17).

Combining PAR with thematic analysis is expected to provide high-quality qualitative data that can be easily shared with those not involved in academic or research settings. This method is also considered more manageable for researchers

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with limited experience. Qualitative data from the PAR was analysed using thematic analysis to help identify emerging themes during focus group discussions. Thematic analysis is a qualitative approach that can assist health research related to implementing clinical practices or policies (18).

The first theme identified in the thematic analysis is that all nurses participating in this study understand the importance of using the Braden Scale as a structured pressure injury risk assessment tool. Qualitatively, the researchers found evidence that nurses also possess certain knowledge about pressure injury risks, their relationship with the patient's clinical condition, and how these risks relate to and impact the patient's family.

This understanding was not measured quantitatively, leading to discrepancies with other research reports from developing and developed countries. Studies in China, Uganda, Iran, and Saudi Arabia found that nurses' knowledge about pressure injuries is still far from expected, indicating a need for further interventions to enhance nurses' knowledge (19–22). A systematic review also found that nurses' knowledge about pressure injury prevention is below the expected level (23).

The nurses participating in this study were selected to initiate the Braden Scale rather than being randomly sampled to represent the entire nursing population in the hospital. This factor may explain the differences between the understanding of the study subjects and that of nurses from various countries.

It is further explained that knowledge about pressure injuries does not necessarily align with attitudes and behaviors towards patients with pressure injuries. A Chinese study found a similar situation where, despite unsatisfactory levels of knowledge among nurses about pressure injuries, positively aligned with expected pressure injury care (19). Most of the nurses in our study knew their important role in preventing pressure injuries and believed they were practicing appropriately to prevent them.

Increasing workload is a fairly rational complaint when implementing new policies, especially when additional assessments need to be measured. This phenomenon was also observed during the initial implementation of the Braden Scale in this participatory action research. The nurses involved, explicitly and implicitly, showed a perception of increased workload due to the additional assessments needed to be completed and the ongoing multiple perceptions regarding using the BS.

This finding is confirmed by research on the automation of fall and pressure injury risk assessments conducted in China. Although the study aimed to evaluate the automation of assessments, nurses mentioned that a drawback of using the Braden Scale is the lengthy time required to complete an assessment and the subjectivity in scoring (23). Nevertheless, nurses felt that non-automated pressure injury risk assessments allowed them to thoroughly check the patient's condition.

The subjectivity noted in the Chinese study above pertains to nutritional status and moisture scoring. The descriptions for each score are still perceived as confusing, leading to varying scores among nurses (24). This issue also sparked extensive discussion in this PAR, leading to the agreement that comprehensive training would be conducted before the full implementation of the Braden Scale.

Regarding the increased workload, the authors found Research in the Philippines that also concluded that there were gaps in the implementation of the BS, including high workload, insufficient staff, lack of material resources, poor patient conditions, and lack of cooperation from patients and their families (25). The study recommended the involvement of hospital management in balancing staff levels and scheduling.

In this study, the authors found that nurses routinely assess functional status using the Katz or Barthel Index. These two indices have long been applied to all newly admitted inpatients, depending on the primary health issue, and the assessment aspects used to complete these indices overlap with those of the BS. Therefore, it is important to relate the perceived changes and workload associated with implementing the BS to these indices, helping nurses recognise their similarities. By taking this approach, it is hoped that the perceived additional workload will be reduced, thereby increasing the acceptability of the BS.

Dixon-Woods and colleagues emphasised in their narrative that middle managers, such as nurse managers, faced difficulties in engaging in system improvements, primarily due to dealing with managerial issues related to resource gap (16). They further mention that leadership for sustaining improvements is needed at all levels

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and is likely more beneficial when facilitating collaboration among various parties. Consistent with the third theme in this PAR, the staff nurses also highly anticipate the role of leaders in managing resources to implement risk assessments.

The implementation of the Braden Scale in this study can also be analysed using a diffusion of innovation theory (26). Diffusion of innovation arises from the discrepancy between the language and terminology used in academic research results and what occurs in everyday practice. Efforts are needed to bridge this gap so academic research findings, including service guidelines, can become standards in everyday practice. This is where diffusion of innovation comes into play.

In healthcare, diffusion of innovation should also consider various past mistakes, such as rushed adoption of innovations, information from unreliable sources, development of costly interventions with minimal benefits, information overload, and wide variations in the implementation of the same service standards (27). Avoiding these errors in disseminating innovations is crucial to effectively implementing the Braden Scale as a tool for assessing pressure injury risk. This is particularly relevant given the extensive reputation of the Braden Scale and its experience around the globe.

The diffusion of innovation rate is influenced by four components: innovation, communication channels, time, and the social system (27). This process begins with innovators who seek to implement the innovation. In this PAR, the researchers are the innovators who recognised the need to use the Braden Scale for pressure injury risk assessment. The nurses who actively contributed to this study and even spread the idea to their respective wards are considered early adopters.

The early adopters have surpassed three of the five diffusion of innovation stages—knowledge, persuasion, and decision-making. The remaining two stages, implementation and confirmation, need to be guided by the collaboration of the hospital's early adopters, middle managers, and top decision-makers. The Braden Scale's trialability feature is one important factor in this diffusion of innovation. It lets the nurses easily experiment with the tool.

Based on our review, this is the first study to use a participatory action research approach to implementing the Braden Scale in a referral hospital. This research has notable strengths. First, it offers significant potential for identifying critical topics and themes related to implementing the Braden Scale in clinical settings. Second, it has effectively formulated various strategic changes to address the issues encountered during the implementation process. This dual contribution underscores the value of participatory action research in healthcare settings.

The main limitation of this study is the restricted scope of its findings to the hospital where the research was conducted. Although the results are valuable for implementing the Braden Scale, other hospitals may encounter different issues. Additionally, we did not conduct in-depth interviews with each subject separately to explore the themes identified in the FGD.

CONCLUSION

The entire cycle of the PAR has revealed three key themes in the initial implementation of the Braden Scale as a tool for assessing pressure injury risk. Through these themes, it is understood that although nurses have grasped the benefits of the Braden Scale, there is also a perception that this implementation increases workload and requires greater involvement from hospital management. Evidently, this PAR cycle has produced early adopters, increasing optimism that the Braden Scale can be fully implemented. The authors recommend conducting comprehensive training on completing the Braden Scale assessment and providing trial opportunities in wards not involved in this study. During the training, it should be emphasised that this risk assessment does not add to the workload of daily nursing care as it can be done concurrently with the assessment of functional status during the initial inpatient nursing assessment.

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