INNOVATIONS JOURNALS

Quality Improvement Project

Improving Patient Safety: Learning from Reported Hospital-Acquired Pressure Ulcers

Anthony Octo Forkuo-Minka,[1] Augustine Kumah,[2] Afua Yeboaa Asomaning[2]

[1]Directorate of Nursing, Nyaho Medical Centre, Accra, Ghana
[2]Directorate of Quality, Nyaho Medical Centre, Accra, Ghana

Address correspondence to Augustine Kumah (augustinekumah@gmail.com).

Source of Support: None. Conflict of Interest: None.

Submitted: Sep 6, 2023; First Revision Received: Nov 15, 2023; Accepted: Nov 27, 2023

Forkuo-Minka AO, Kumah A, Asomaning AY. Improving patient safety: learning from reported hospital-acquired pressure ulcers. *Glob J Qual Saf Healthc.* 2024; 7:15–21. DOI: 10.36401/JQSH-23-25.

This work is published under a CC-BY-NC-ND 4.0 International License.

ABSTRACT

Introduction: A hospital-acquired pressure ulcer (HAPU) is a localized lesion or injury to the underlying tissue (wound) while the patient is on admission. It occurs when standardized nursing care is not correctly followed in the presence of friction and shear, leading to skin or underlying tissue breakdown. Unfortunately, inadequate knowledge of nurses to assess and provide standardized care for pressure ulcers or manage HAPUs results in patient harm. We aim to share lessons from a reported HAPU incident and address the knowledge gap in patient safety risk assessment, identification, and wound management at Nyaho Medical Centre (Accra, Ghana). **Methods:** A review of HAPU incidents was conducted using quality improvement tools such as cause-and-effect analyses to identify contributing factors and root causes. Subsequently, plan-do-study-act (PDSA) cycles were used to test interventions to improve pressure ulcer assessments and wound management. A run chart was used to analyze and evaluate the interventions over 12 weeks (Aug–Oct 2021). **Results:** Development of policies and a standard operating procedure for pressure ulcers and wounds improved accuracy in identifying pressure ulcer risks and management of wounds. Eighty-three patients were assessed with the pressure ulcer assessment tool. Complete (100%) adherence to the pressure ulcer and wound policy and standard operating procedure (SOP) was achieved, and the number of HAPUs decreased from five to one during the study period. **Conclusion:** This study demonstrated that the combined use of quality methods and tools can be suitable for improving processes and outcomes for patients at risk for HAPUs.

Keywords: incident reporting and management systems, hospital-acquired pressure ulcer, patient safety

INTRODUCTION

Hospital-acquired pressure ulcers (HAPUs) are defined as "localized injury to the skin and/or underlying tissue usually over a bony prominence because of pressure, or in combination with shear."[1] Risk factors include older age, cognitive impairment, physical impairments, and comorbid conditions that affect soft tissue integrity and healing. Other risk factors include urinary incontinence, edema, impaired microcirculation, hypoalbuminemia, and malnutrition.[2,3] Pressure ulcers affect 1.3 million to 3 million adults in the United States. They are associated with decreased quality of life, impaired function, complications such as infection, poorer prognosis, and increased care costs.[3–6] Studies revealed that HAPU is common in low- to middle-income countries but is rarely researched.[7]

Interventions to prevent and reduce the severity of ulcers have a positive effect rather than treating ulcers after they have developed.[8] Generally, prevention of pressure ulcers involves using risk assessment tools to identify persons at higher risk and standardized care.[1,9] Commonly used risk assessment tools include the Braden, Norton, and Waterlow scales.[3,10] Standardized care includes ripple beds, repositioning, skin care, barrier creams, and nutritional supplementation.[9] However, interventions may vary according to patient characteristics such as comorbidities, mental health conditions, and continuity of care (care setting). For example, nutritional supplementation benefits the undernourished, and skin care helps incontinent patients.

Study Setting

Nyaho Medical Centre (NMC) is located in Ghana, Africa. It is the oldest private group medical practice,

and it seeks to achieve the highest quality and patient safety standards of primary and specialist healthcare in Ghana and the West African sub-region. It is a multispecialty medical center committed to excellent clinical practice and specialist healthcare delivery. It is grounded in international best practices and core values such as innovation, teamwork, quality care, patient- and family-centered care, and a culture of trust.[11] NMC has four branches in the Greater Accra region and one branch in the Western region. NMC's vision is to become Africa's most trusted name in healthcare. Its mission is to transform patients' lives by surpassing healthcare expectations and inspiring hope for a better Africa. In 2021 the facility recorded 5340 inpatients, 20,132 emergencies, and 68,434 outpatients.

NMC incident reporting and management systems drive the desire to improve patient safety by learning from critical analysis of incidents. A standing committee of dedicated multiprofessionals meets to perform a systematic and nonpunitive review of all incidents. This creates a diversity of expert opinions, resulting in impartial learning from errors. Crucially, perspectives from non-health disciplines contribute to desired outcomes or actions that reduce harm incidents within the organization.[7] NMC incident reporting and management systems ensure that incident investigations are also carried out in an atmosphere of trust where blame and retribution are discouraged. In incidents involving unethical professional behavior, indiscipline, or "criminality," the process results in consideration of sanctions and learning from errors. Actions resulting from the incident management system focus on redesigning policies, processes of care, services, and procedures, and changes to clinical care practices. Such actions have resulted in measurable and sustained improvements in reducing patient harm and HAPU risk.[12]

This quality improvement (QI) project aims to increase adherence using a pressure ulcer risk assessment tool and reduce the incidence of HAPU incidents in NMC.

METHODS

A facility-based assessment of the following incident was conducted in May 2021.

> *"My mother was admitted to this facility a couple of weeks ago. I had been communicating with the medical team on her progress until discharge. I was told that there was a bit of a bedsore when she came in. On discharge, no one mentioned to me that the bedsore had become this bad. How can I leave my mother in your care for her to develop such big ulcers? No one educated the family on discharge. I learned about this when I engaged a nurse to care for her at home. Then she sends me those horrible pictures of bedsores. I came down to take this facility on, but before I came, I had shared these pictures with the ward doctors, and they had mentioned to me that they had forwarded them to the nurse manager in charge of the ward. I am in communication with Dr. A to have a look at the ulcers for possible debridement, and I want this hospital to take full responsibility for this bedsore."*

Ethical clearance was not required for this QI project. QI tools such as cause-and-effect analyses, plan-do-study-act (PDSA) cycles, and run charts were used to analyze the incident's root causes and evaluate improvements made over time.

Cause-and-Effect Analysis

A fishbone diagram is a cause-and-effect analysis to identify the most significant cause. This was carried out to determine the factors that contributed to the HAPU incident.[1] The most likely causes of the incident were categorized as follows.

1. **Facility issues:** No policy on pressure ulcer and wound management, no available tool for pressure ulcer risk assessment, and no mechanical hoist to assist with lifting patients.
2. **Education and training:** There was a knowledge gap in pressure ulcer risk assessment, prevention, and management; no policy and standard operating procedure (SOP) training.
3. **Behavior:** Frequent change (turning) of patient's position was not done and documented, not listening to patients and family concerns.
4. **Process:** No process for pressure ulcer risk assessment for a patient on admission, no patient safety metric on pressure ulcer and wound care, lack of patient care plan, and no discharge planning.
5. **Staffing:** Inadequate skill mix and shift supervisors; knowledge gap in pressure ulcer risk assessment, prevention, and management; and no staff orientation and competence assessment.

The five whys is an iterative technique to explore relationships underlying a particular problem.[13] The objective was to determine the root cause of the HAPU by repeating the question "Why?" five times. With each answer framing the basis of the next question, it determines that there are multiple causes for the incident that need to be considered. Together, the five whys and fishbone diagram help identify all the barriers that limit compliance with best practices for patient safety and quality.[13]

Plan-Do-Study-Act (PDSA)

PDSA is a quality improvement method used to test interventions efficiently.[14] This concept involves structured, iterative tests of change. The team (comprising nurses, doctors, pharmacists, and orderlies [housekeeping staff]) brainstormed for interventions. Two cycles were completed to assess the accuracy of the pressure ulcer assessment tool for identifying patients with or at

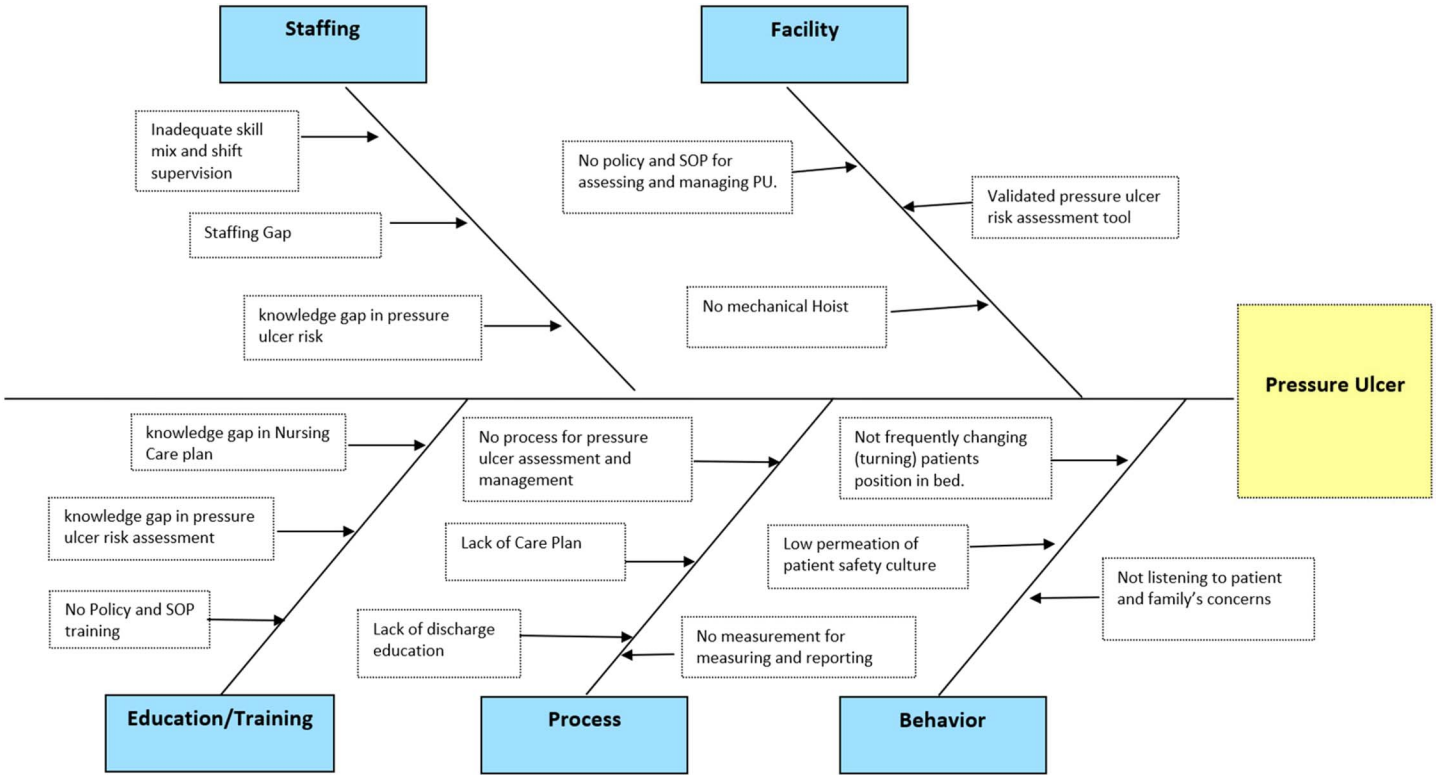


Figure 1. Fishbone diagram showing root cause analysis of the hospital-acquired pressure ulcer incident. SOP: standard operating procedure.

risk for developing HAPUs. These cycles are described in the following section.

Run Chart

A run chart is a line graph of data plotted over a period to show changes and patterns in data.[15] It depicts graphically how a process is performed or how the data values change over time. A run chart was used to focus attention on variations (intentional and unintentional) in the interventions and to track useful information for predicting further trends for analysis and evaluation of the intervention data.

Measures

The following key performance indicators (KPIs) were used to document and measure the improvements during the study period.

- Number of reported HAPU incidents
- Number of worsening pre-existing pressure ulcers
- Percentage adherence or compliance to pressure ulcer policy and SOP
- Percentage adherence with the use of a pressure ulcer risk assessment tool

INTERVENTIONS

The team studied the findings from cause-and-effect analyses (i.e., fishbone diagram [Fig. 1] and five whys) to determine suitable interventions for amelioration (Fig. 1). The interventions were tested with PDSA cycles and analyzed over time with a run chart. The team applied a bundle of improvement strategies (interventions) that included the following:

1. Development of pressure ulcer and wound management policy and SOP with compliance monitoring
2. Adaptation of pressure ulcer risk assessment tools during the patient evaluation process upon admission
3. Determination of key performance indicators for measuring and reporting pressure ulcers
4. Staff education and training on pressure ulcer risk assessment, prevention, and wound management
5. Strengthening a culture of patient safety
6. Instituting the use of nursing processes to plan care for pressure ulcers and wounds
7. Provide patient and family education on the management of bedsores upon discharge

PDSA Cycle 1 – Initial (Baseline) Assessment

Aim: Test the accuracy of the pressure ulcer assessment tool for identifying patients with or at risk for developing pressure ulcers.

Plan: Develop and train all nurses on the pressure ulcer and wound policy, SOP, and pressure ulcer assessment tool.

Do: Nurses use the pressure ulcer assessment tool to assess all patients before and during admission. The charge nurse of the ward monitors compliance with the use of the pressure ulcer assessment tool.

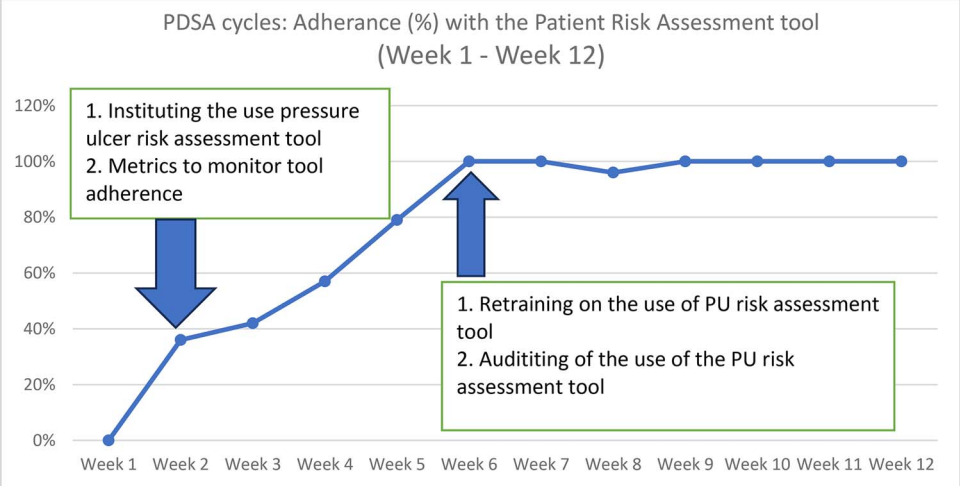


Figure 2. Number of pressure ulcer (PU) incidents recorded. SOP: standard operating procedure.

Study: The nurses' compliance with the pressure ulcer risk assessment tool was initially poor, owing to the high nurse attrition rate in the ward. Newly employed nurses were unaware of the use of the pressure ulcer risk assessment tool. The team discussed the low use of the pressure ulcer assessment tool and assigned the charge nurse to include orientation on the pressure ulcer assessment tool as part of onboarding new nurses to the ward.

Act: We developed a training schedule for all nurses to use the pressure ulcer assessment tool to identify patients with pressure ulcers or at risk of developing pressure ulcers.

PDSA Cycle 2 – Repeat Assessment

Aim: To retest the effectiveness of and increase adherence with using the pressure ulcer risk assessment tool.

Plan: Strengthen the patient safety culture in NMC and re-train all nurses on the pressure ulcer and wound policy, SOP, and pressure ulcer assessment tool.

Do: New nursing processes were introduced to help plan care for pressure ulcers and wounds. KPIs for HAPUs were developed and reported. Education on managing bedsores was provided to patients and families upon discharge.

Study: There was an improvement in nurses' compliance with the use of the pressure ulcer risk assessment. There was also an improvement in the number of reported pressure ulcer incidents (from five to one) during the project implementation period. Among 83 patients assessed with the pressure ulcer assessment tool, there was one identified incident of pressure ulcer.

Act: The team strengthened (built) a culture of patient safety in NMC; ensured continued staff education and training on pressure ulcer risk assessment, prevention, and wound management; and instituted a discharge process that ensured discharge education on pressure ulcers for patients and provided discharge summaries to patients.

RESULTS

A total of 83 patients were evaluated with the pressure ulcer assessment tool during the study period. There was a significant improvement in the number of HAPUs reported (decreased from five to one) during the study period (Fig. 2). Complete (100%) adherence to pressure ulcer assessment and SOPs was achieved for all patients (Fig. 3), which facilitated the improvement in HAPUs.

DISCUSSION

Development of Policies and Procedures with Compliance Monitoring

HAPUs have a substantial effect on the health-related quality of life of patients.[16,17] Most are preventable, and there is a clear link between HAPUs and vulnerable adults.[5,18] There is also a significant effect of the financial burden on health service, patients, and their families.[4] Following the incident that was reported in May 2021, NMC developed a policy on pressure ulcer prevention and wound management. The policy and SOP provided a standardized, validated tool and approach to wound care within the framework of holistic care. This ensures appropriate management of acute, surgical, and chronic wounds and ensures that the most appropriate product is used for optimum wound healing, patient comfort, and cost-effectiveness. Furthermore, it ensured that no act or omission on the nurse's part would lead to inappropriate wound management in NMC. The policy and SOP promoted a coordinated and systematic approach to wound management, addressing symptom control, treatment materials (consumables), and maintaining the individual's quality of life while recognizing that complete healing is not always achievable.

We engaged in regular policy and SOP compliance monitoring to reinforce best practices to prevent patients at risk from developing pressure ulcers. Daily monitoring and reporting of patients at risk of developing pressure

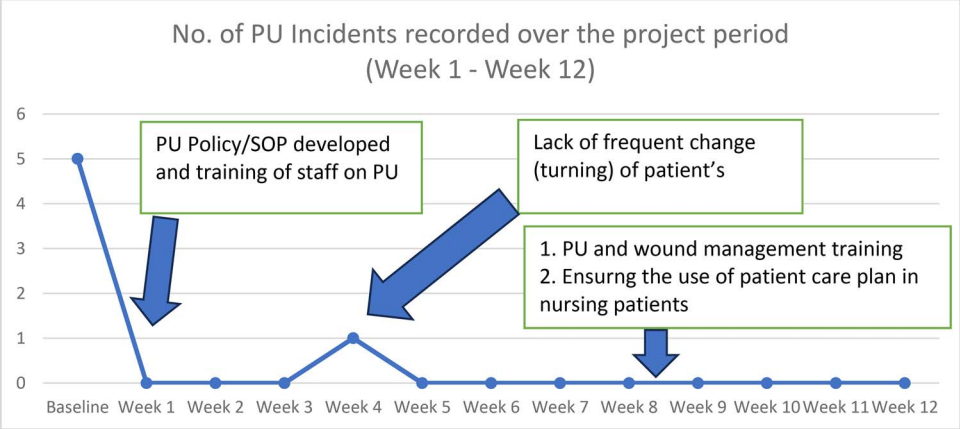


Figure 3. Percentage adherence with the use of the patient pressure ulcer (PU) risk assessment tool. PDSA: plan-do-study-act.

ulcers are done, as well as spot-checks and audits. This ensured internal control processes were adhered to and consolidated learning from compliance reported was taking place.

Adaptation of Pressure Ulcer Risk Assessment During Patient Evaluation Upon Admission

The use of pressure ulcer risk assessment tools or scales is a component of the assessment process used to identify individuals at risk of developing a pressure ulcer (Fig. 4). The tool was adapted to suit the context of NMC per the developed policy and SOP of NMC. Sections to describe the pressure ulcer, the area assessed, and guidance for the type of dressing or treatment to apply were incorporated to create a comprehensive assessment tool.

Developing and Reporting of Key Performance Indicators

Quality evaluations are usually based on key performance indicators (KPIs). KPIs are standardized measurements for quantitative data that may be related to the quality of service or performance.[17] To perform this task, KPIs must meet quality criteria themselves to produce accurate and reliable data.[19] Metrics to monitor performance and ensure quality and safety were developed, monitored, and reported daily and monthly.

Staff Education and Training

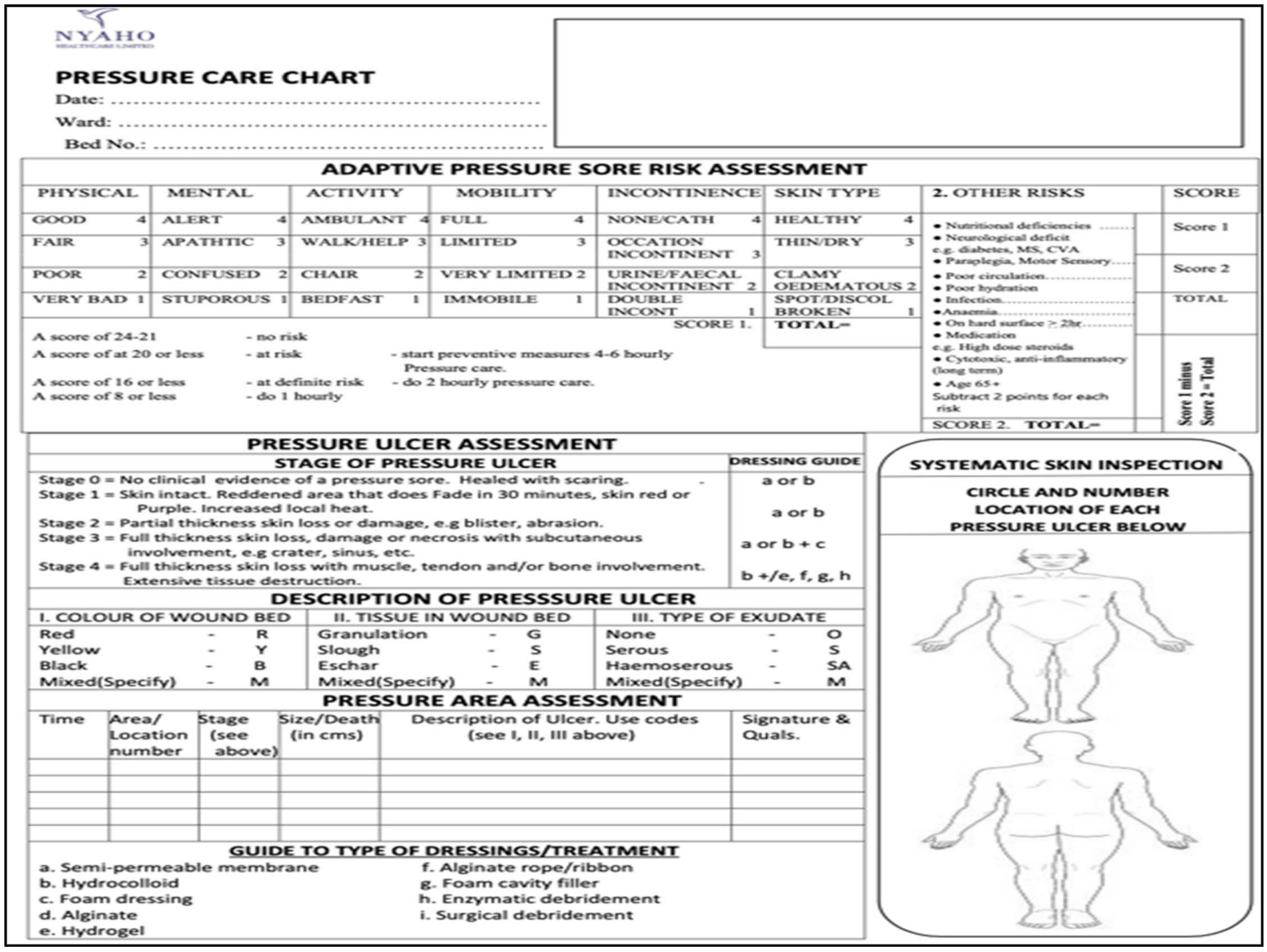
Previous studies show that nurses' knowledge and skills vary within different HAPU prevention domains[20,21] and that nurses have a greater ability to recognize and prevent the risks of HAPUs.[16] However, many nurses are unable to identify pressure ulcer prevention protocols,[18] reduce the amount of pressure on the tissue,[20] or classify and assess pressure ulcer risk.[18] Furthermore, nurses may have limited knowledge of pressure ulcer development[19] and risk reduction.[22] Nurses who frequently take care of patients with pressure ulcers[23] and receive pressure ulcer training[23] have better prevention and treatment knowledge than those with less training.

Following assessments of the staff's learning and training needs, NMC designed simulation training to address the knowledge gap on pressure ulcer risk assessment, prevention, and wound management. The training covered patient assessment and pressure ulcer risk identification, prevention of pressure ulcers and management of wounds, policy, SOP adherence, the use of the pressure ulcer risk assessment tool, and incident reporting and documentation. Based on the hierarchy of effectiveness of interventions, a "force function" initiative was instituted at the end of each pressure ulcer assessment and wound management training, which mandated all new joiners to score not less than 80% pass mark after the training to demonstrate adequate knowledge and understating of pressure ulcer assessment, use of the pressure ulcer risk assessment tool, wound management, and culture of safety.

Strengthening a Culture of Patient Safety

Employing a clinical workforce strong in numbers and capabilities and designing the nursing workforce to prevent burnout (work overload) are critical patient safety parameters.[19,24] However, even the most capable workforce is fallible.[19] Moreover, introducing new staff or new healthcare technology brings many unanticipated opportunities for errors.[21] Therefore, improving patient safety requires more than relying on identifying and measuring patient safety indicators, building incident reporting, and reviewing processes and management systems; it also includes a structured workforce and well-designed work processes. This requires an organizational commitment to safe staffing, adequate skill mix to provide supervision during shifts, vigilance for detection of potential errors, analyzing and addressing errors when they occur, and continuous learning.[25]

Ensuring a culture of safety and implementing interventions to reduce the incidence of pressure ulcers



NYAHO

PRESSURE CARE CHART

Date: .....

Ward: .....

Bed No.: .....

ADAPTIVE PRESSURE SORE RISK ASSESSMENT

PHYSICAL	MENTAL	ACTIVITY	MOBILITY	INCONTINENCE	SKIN TYPE
GOOD 4	ALERT 4	AMBULANT 4	FULL 4	NONE/CATH 4	HEALTHY 4
FAIR 3	APATHTIC 3	WALK/HELP 3	LIMITED 3	OCCATION INCONTINENT 3	THIN/DRY 3
POOR 2	CONFUSED 2	CHAIR 2	VERY LIMITED 2	URINE/FAECAL INCONTINENT 2	CLAMY OEDEMATOUS 2
VERY BAD 1	STUPOROUS 1	BEDFAST 1	IMMOBILE 1	DOUBLE INCONT 1	SPOT/DISCOL BROKEN 1
				SCORE 1.	TOTAL=

A score of 24-21 - no risk
A score of at 20 or less - at risk - start preventive measures 4-6 hourly Pressure care.
A score of 16 or less - at definite risk - do 2 hourly pressure care.
A score of 8 or less - do 1 hourly

2. OTHER RISKS

- Nutritional deficiencies
- Neurological deficit e.g. diabetes, MS, CVA
- Paraplegia, Motor Sensory
- Poor circulation
- Poor hydration
- Infection
- Anaemia
- On hard surface > 2hr
- Medication e.g. High dose steroids
- Cytotoxic, anti-inflammatory (long term)
- Age 65+

Subtract 2 points for each risk

SCORE 2. TOTAL=

SCORE: Score 1; Score 2; TOTAL; Score 1 minus Score 2 = Total

PRESSURE ULCER ASSESSMENT

STAGE OF PRESSURE ULCER — DRESSING GUIDE

Stage 0 = No clinical evidence of a pressure sore. Healed with scaring. - a or b
Stage 1 = Skin intact. Reddened area that does Fade in 30 minutes, skin red or Purple. Increased local heat. - a or b
Stage 2 = Partial thickness skin loss or damage, e.g blister, abrasion. - a or b + c
Stage 3 = Full thickness skin loss, damage or necrosis with subcutaneous involvement, e.g crater, sinus, etc.
Stage 4 = Full thickness skin loss with muscle, tendon and/or bone involvement. Extensive tissue destruction. - b +/e, f, g, h

DESCRIPTION OF PRESSSURE ULCER

I. COLOUR OF WOUND BED		II. TISSUE IN WOUND BED		III. TYPE OF EXUDATE	
Red	R	Granulation	G	None	O
Yellow	Y	Slough	S	Serous	S
Black	B	Eschar	E	Haemoserous	SA
Mixed(Specify)	M	Mixed(Specify)	M	Mixed(Specify)	M

PRESSURE AREA ASSESSMENT

Time	Area/ Location number	Stage (see above)	Size/Death (in cms)	Description of Ulcer. Use codes (see I, II, III above)	Signature & Quals.

GUIDE TO TYPE OF DRESSINGS/TREATMENT

a. Semi-permeable membrane
b. Hydrocolloid
c. Foam dressing
d. Alginate
e. Hydrogel
f. Alginate rope/ribbon
g. Foam cavity filler
h. Enzymatic debridement
i. Surgical debridement

SYSTEMATIC SKIN INSPECTION

CIRCLE AND NUMBER LOCATION OF EACH PRESSURE ULCER BELOW

Figure 4. Adaptive pressure ulcer risk assessment tool.

became a necessity. After the reported incident, we started a rigorous patient and staff safety campaign to build a culture of safety in NMC. The focus was to ensure that staff understood the importance of safety, exhibited positive safety behaviors, and adhered to the pressure ulcer and wound management policy. To achieve this, it was critical to promote a "just culture" at NMC. We created an atmosphere of trust whereby staff were recognized and rewarded for reporting safety-related incidents, including those that never reached the staff and patients (near misses).[11]

Patient and Family Education upon Discharge

The World Health Organization considers that health education is not limited to disseminating health-related information but also "fostering the motivation, skills, and confidence (self-efficacy) necessary to take action to improve health".[26] Patient involvement in their own healthcare process are important aspect of healthcare provision.[27] Benefits of patient involvement include increased motivation and knowledge about health and illness, resulting in patients having increased capacity to monitor and look after themselves, increased patient safety, and better health outcomes.[28]

The HAPU incident that occurred at our institution revealed that no education was provided to the patient and relatives upon discharge. This necessitated educating patients at risk for pressure ulcers on discharge and issuing a discharge summary to patients and their relatives.

Limitations

This study was a short project limited to one ward at NMC. The circumstances and findings may not be the same in other wards or hospitals.

CONCLUSION

Development of policies, SOPs, and training for assessing and managing pressure ulcers and wounds

reduced the number of HAPUs during a 12-week period. This study demonstrated that the combined use of quality methods and tools can be suitable for improving processes and outcomes for patients at risk for HAPUs. The findings from this improvement project will be shared across our organization at quality and safety conferences and workshops for shared learning. To ensure sustainability, the QI team continues to measure and report KPIs to the clinical governance subcommittee. We intend to implement similar improvements in other patient care areas.

Acknowledgments

The authors thank Dr. Elikem Tamaklo (Managing Director, NMC) for his leadership support throughout the project and Juliet Kwadzodeh (Former IPC Lead and ICU Nurse Consultant, NMC) for providing guidance on the development and training of all nurses on the pressure ulcer and wound management SOP and pressure ulcer assessment tool.

References

1. Kottner J, Cuddigan J, Carville K, et al. Prevention and treatment of pressure ulcers/injuries: The protocol for the second update of the international Clinical Practice Guideline 2019. *J Tissue Viability*. 2019;28:51–58.
2. Fogerty MD, Abumrad NN, Nanney L, Arbogast PG, Poulose B, Barbul A. Risk factors for pressure ulcers in acute care hospitals. *Wound Repair Regen*. 2008;16:11–18.
3. Lyder CH, Ayello EA. Pressure ulcers: a patient safety issue. In: Hughes RG, Ed. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Agency for Healthcare Research and Quality; 2008.
4. Kuhn BA, Coulter SJ. Balancing the pressure ulcer cost and quality equation. *Nurs Econ*. 1992;10:353–359.
5. Mervis JS, Phillips TJ. Pressure ulcers: prevention and management. *J Am Acad Dermatol*. 2019;81:893–902.
6. Russo A, Steiner C, Spector W. Hospitalizations related to pressure ulcers among adults 18 years and older, 2004. *Healthcare Cost and Utilisation Project*. 2008:64.
7. Gedamu H, Hailu M, Amano A. Prevalence and associated factors of pressure ulcer among hospitalized patients at Felegehiwot Referral Hospital, Bahir Dar, Ethiopia. *Adv Nurs*. 2014;767358.
8. Oot-Giromini B, Bidwell FC, Heller NB, et al. Evolution of skin care. Pressure ulcer prevalence rates pre/post-intervention. *Decubitus*. 1989;2:54–55.
9. Ratliff CR, Tomaselli N, Goldberg M, et al. WOCN update on evidence-based guideline for pressure ulcers. *J Wound Ostomy Continence Nurs*. 2010;37:459–460.
10. Bergstrom N, Braden BJ, Laguzza A, Holman V. The Braden scale for predicting pressure sore risk. *Nurs Res*. 1987;36:205–210.
11. Kumah A, Forkuo-Minka AO. Advancing staff safety: assessment of quality improvement interventions in reducing needlestick injuries among staff at Nyaho Medical Centre. *Glob J Qual Saf Healthc*. 2023;6:55–61.
12. *Patient Safety Incident Reporting and Learning* Systems*: Technical Report and Guidance*. World Health Organization; 2020.
13. Card AJ. The problem with 5 whys. *BMJ Qual Saf*. 2017;26:671–677.
14. *RCA^2 Improving Root Cause Analyses and Actions to Prevent Harm*. National Patient Safety Foundation; 2015.
15. Perla RJ, Provost LP, Murray SK. The run chart: a simple analytical tool for learning from variation in healthcare processes. *BMJ Qual Saf*. 2011;20:46–51.
16. Miller DM, Neelon L, Kish-Smith K, et al. Pressure injury knowledge in critical care nurses. *J Wound Ostomy Continence Nurs*. 2017;44:455–457.
17. Taylor C, Mulligan K, McGraw C. Barriers and enablers to the implementation of evidence-based practice in pressure ulcer prevention and management in an integrated community care setting: A qualitative study informed by the theoretical domains framework. *Health Soc Care Community*. 2021;29:766–779.
18. Kim SA, Kim EM, Lee JR, Oh EG. Effect of nurses' perception of patient safety culture on reporting of patient safety events. *J Korean Acad Nurs Admin*. 2018;24:319.
19. Sox HC. Improving patient care. *Ann Intern Med*. 2003;138:996.
20. Cardoso D da S, Carvalho FMO, da Rocha GB, et al. The nurses' knowledge with regards to both classification and prevention of pressure injury. *Rev Pesquisa: Cuidado Fund. Online*. 2019;11(3).
21. Fulbrook P, Lawrence P, Miles S. Australian nurses' knowledge of pressure injury prevention and management: a cross-sectional survey. *J Wound Ostomy Continence Nurs*. 2019;46:106–112.
22. De Meyer D, Verhaeghe S, Van Hecke A, Beeckman D. Knowledge of nurses and nursing assistants about pressure ulcer prevention: A survey in 16 Belgian hospitals using the PUKAT 2.0 tool. *J Tissue Viability*. 2019;28:59–69.
23. Aydın AK, Karadağ A, Gül Ş, Avşar P, Baykara ZG. Nurses' knowledge and practices related to pressure injury: a cross-sectional study. *J Wound Ostomy Continence Nurs*. 2019;46:117–123.
24. Ryu IS, Shim J. The influence of burnout on patient safety management activities of shift nurses: the mediating effect of compassion satisfaction. *Int J Environ Res Public Health*. 2021;18:12210.
25. Øvretveit J. Quality evaluation and indicator comparison in health care. *Int J Health Plann Manage*. 2001;16:229–241.
26. LeBlanc K, Campbell KE, Wood E, Beeckman D. Best practice recommendations for prevention and management of skin tears in aged skin: an overview. *J Wound Ostomy Continence Nurs*. 2018;45:540–542.
27. Nilsen ES, Myrhaug HT, Johansen M, Oliver S, Oxman AD. Methods of consumer involvement in developing healthcare policy and research, clinical practice guidelines and patient information material. *Cochrane Database Syst Rev*. 2006;2006:CD004563.
28. Davis RE, Sevdalis N, Vincent CA. Patient involvement in patient safety: how willing are patients to participate? *BMJ Qual Saf*. 2011;20:108–114.