

A systematic review of clinical audit on prevention of pressure ulcer in immobile patients

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ABSTRACT

Background: The prevention of pressure ulcers among immobile patients is the major concern of health care centers. Auditing the interventions been applied by the hospital centers for the prevention of pressure ulcers.

Aim: The aim of the paper is to systematically review the clinical audit been done for the prevention of pressure ulcer in immobile patients.

Methods: A comprehensive search for primary research articles were collected from different database like NCBI, PubMed, Researchgate.net, Google scholar using the keywords pressure ulcers, clinical audit, prevention words were used for searching. A number of researches that were found relevant for the study and are those which satisfy the inclusion criteria are been selected.

Discussion: The finding from the literature of review shows that among 8 studies 4 studies are based on nursing documentation on pressure ulcer and other 4 studies based are based on the interventions been carried out by nursing home for the prevention of pressure ulcers. Studies based on nursing documentation lacked completeness and was generally poor and the other studies gave evidence that the patient had received preventive measures the rest of the studies also depicts that patient who developed pressure ulcers were not assessed at admission for risk of pressure ulcer .

Conclusion: Reviews from these studies conclude that the purpose of documentation to record, communicate and support the flow of information in the patient record was not met. The patient records lacked accuracy, completeness, and comprehensiveness, which can jeopardize patient safety, continuity, and quality of care.

Keywords: clinical audit, ulcer, immobile patients.

INTRODUCTION

Pressure ulcers (PUs), also known as pressure sores, decubitus ulcers, and bedsores, are localized injuries of the skin or underlying tissue that most often occur over bony prominences and which can be caused by any combination of pressure, shear forces, or friction.

Pressure ulcer in hospitalized patients continues to be a serious economical and clinical challenge across the clinical centers. A pressure ulcer is the major cause of significant morbidity and certain cases mortality.

The National Pressure Ulcer Advisory Panel (NPUAP) defines a pressure ulcer as “localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction”.

Pressure ulcer treatment is costly, and the development of pressure ulcers can be prevented by the use of evidence-based nursing practices.

Pressure ulcers are internationally recognized as an important and mostly avoidable indicator of health care quality. The development of hospital-acquired pressure ulcers is a great concern in healthcare today.

The term ‘clinical audit’ is used to describe a process of assessing clinical practice against standards. A clinical audit is a tool that can be used to discover how well clinical care is being provided and to learn if there are opportunities for improvement. A clinical audit may be used to improve aspects of care in a wide variety. Through a systematic view, the audit is presented to identify the contributing factors and preventive measures that impact pressure ulcer prevalence in a health care setting. The result of the audit would be valuable in bringing about substantial change in the approach to the management of pressure ulcer settings.

NEED FOR STUDY

As per WHO pressure ulcers remain a major health problem affecting 3 million adults every year.

Pressure ulcers markedly affect patients’ quality of life morbidity and mortality. Pressure ulcers also account for considerable direct and indirect costs in the health care economy. International publications provide many illustrations of the financial burden of pressure ulcers. It has a psychological, economic, and social impact on individuals and families.

Although the development of a PU when admitted to an ICU has no direct effect on mortality, it indirectly contributes to mortality risk. Clough and colleagues compared patients with and without PU in a prospective study and reported a mortality rate of 63% in the group with PU as compared to a 15% rate in the group without PU.

Pressure ulcers are a mostly avoidable incidence. Reduction of pressure sore incidence is a Department of Health priority. The incidence of hospital-acquired PU is considered an indicator of the quality of patient care, and failure to provide appropriate preventive care may increase the risk of litigation. Patients who develop hospital PU experience

additional morbidity, pain, and psychosocial distress associated with a loss of independence and social isolation. They tend to have longer hospital stays and pain related to the PU and increased non-reimbursable costs to the facility.

Pressure ulcers have a profound impact on the overall wellbeing of patients. Pressure ulcers are a key indicator of the quality of care provided to patients. Despite progress achieved in the management of pressure ulcers, they are still a significant healthcare problem across the whole health economy.

Pressure sores are accepted as largely preventable complications of illness and disability and the means to achieve prevention are available. Prevention of pressure ulcers assumes extreme importance to improve quality of care, reduce harm and improve the patient experience. The cost of identifying patients at risk for pressure ulceration and implementing appropriate preventive measures is lower than the cost of treatment for PU. Therefore, the implementation of a prevention program with appropriate risk assessment and judicious application of preventive measures is justified.

Clinical audit is about measuring the quality of care we provide against relevant standards. If we are failing to meet these standards, the audit should help us understand the factors that are causing us to fail, so that we can set priorities and make improvements. Conducting a clinical audit of pressure ulcer prevention will help to discover how well clinical care is being provided and to improve the quality and effectiveness of healthcare and also there is little information available related to audit on prevention of pressure ulcer. Therefore, the need was felt to undertake clinical audit on prevention of pressure ulcer.

STATEMENT OF THE PROBLEM

A systematic review of clinical audit on prevention of pressure ulcer in immobile patients.

OBJECTIVE

To identify the empirical evidence of clinical audit on prevention of pressure ulcer in the immobile patients.

OPERATIONAL DEFINITIONS

Systematic Review: It is a review of a clearly formulated question that uses systematic and reproducible methods to identify, select and critically appraise all relevant research, and to collect and analyze data from the studies that are included in the review.

In this study, systematic review means an organized way of viewing the interventions been used for the prevention of pressure ulcers.

Clinical Audit: Clinical audit means a quality improvement process that seeks to improve patient care and outcomes.

In this review study, clinical audit is a way of reviewing the health care practices for the prevention of pressure ulcers.

Prevention: According to the Cambridge dictionary prevention means to act of stopping something happening.

In this review study, what all actions have been taken by the health care team to decrease the chance of getting a disease or condition.

Pressure Ulcer: According to the Oxford Dictionary pressure ulcer means the area of necrosis caused by compression between bony prominences and external surfaces.

In this review study, pressure ulcer means the damage to the skin that results in long time pressure on part of the body.

Immobile Patient: According to Cambridge Dictionary immobile patient means the patient cannot move

In this review study, immobile patient means bedridden patients.

CONCEPTUAL FRAMEWORK

The theoretical framework is the overall conceptual understanding of the study. Every study has a framework. The present study was based upon J. W. Kenny's Open System model, which was developed from the General System Theory originated by Ludwig von Bertalanffy.

Input

According to the theorist, input refers to matter and information. All systems must receive varying types and amounts of information in the environment. In the present study, the input was interventions for the prevention of pressure ulcers among immobile patients.

Throughput

According to the theory, throughput refers to a process by which the system processes input and releases an output of functions and information. In the present study, the throughput refers to a systematic review of clinical audit of prevention of pressure ulcer.

Output

According to the theory, the output refers to matters, energy and information that leave a system. In the present study, comparing and evaluating the previous studies reviewed.

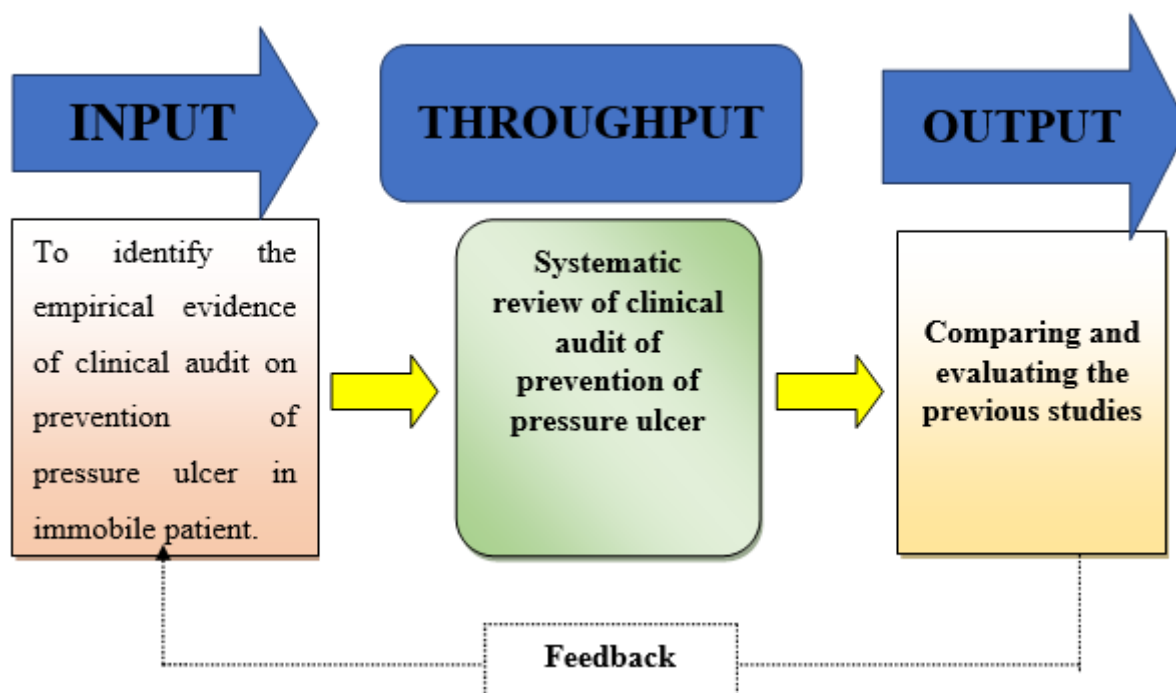


Figure 1: Conceptual Framework Based On Open System Model Theory

RESEARCH METHODOLOGY

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. In other words, it is a way to systematically solve the research problem by logically adopting various steps. Methodology helps to understand not only the products of scientific inquiry but the process itself.

SEARCH STRATEGY

A comprehensive search strategy was developed consisting of search terms “audit for prevention of pressure ulcer.” To increase specificity the searches were refined and limited auditing of prevention of pressure ulcer among immobile patients. The search strategy is available on request. The search was carried out between 2004 -2017 of articles abstract and titles using a combination of major english keywords on the subject including audit of pressure ulcer, prevention of pressure ulcers, and immobile patients. The full text or abstract of articles, documents and reports yielded by the advanced search were extracted.

INCLUSION CRITERIA

Primary studies were included if they meet following criteria:

- Researches published in English language between 2004-2017
- Studies which are conducted the clinical audit for prevention of pressure ulcers are been selected
- Studies are based on the audit of interventions for prevention of pressure ulcer
- Studies with comprehensible results are been taken

EXCLUSION CRITERIA

- Studies published before 2004.
- Studies which to assess the risk factors of pressure ulcers are excluded
- Studies done in community level

LIMITATIONS

The study is been delimited to the auditing on the interventions for the prevention of pressure ulcer among immobile patients.

FINDINGS AND INTERPERTATION

A systematic review draws together the results of several primary research studies. A systematic review seeks to provide an overview of the finding of factual evidences of clinical audit on prevention of pressure ulcers.

Table No -1: Evidence related to clinical audit on prevention of pressure ulcer

Sr. No	First Author	Research Design	Sample	Year	Result
1	Lorenzo Right	Prospective longitudinal design with cross sectional assessment	22 Nursing homes	2017	The result states that 27 nursing homes participated in the programme in 2015 and 2016 (4607 patients) and 15 continued in 2017 (1357 patients). Patients were mostly females, with mean age > 86 years and median length of stay about 2 years. The programme significantly improved two preventive measures: patient repositioning and anti-decubitus bed or mattress. It also reduced acquired pressure ulcers prevalence in nursing homes that participated during all 3 years (from 4.5% in 2015 to 2.9% in 2017, p 0.035), especially in those with more patients with pressure ulcers.
2	Ruth Linda	Cross sectional descriptive design	115 Patient record	2013	The result from this study depict that the prevalence of pressure ulcers was 38 (26%) in the audit of the patient records and 33 (22%) in patient examinations. A total of 17 (45%) of the documented pressure ulcers were not graded. When comparing the patient examinations with the patient record contents, the patient records lacked information about pressure ulcers and preventive interventions.
3	Asta Thoroddsen	Cross sectional descriptive study	219 Patient records	2012	The result from this study states depict that the prevalence of pressure ulcers was 21%. Information in patient records lacked accuracy, completeness and comprehensiveness. Only 60% of the identified pressure ulcers were documented in the patient records. The lack of accuracy was most prevalent for stage I pressure ulcers.
4	Phillips, L., Buttery, J	Standardised Methodology	44 Acute hospitals	2009	The results from this study states that simple descriptive data was reported to illustrate emergent trends associated with implementation of the NICE guidelines and to

					highlight areas that may influence the persistence of double figure ulcer. The three year audit indicates a relatively static over all prevalence of 10.2%-10.3% despite increased awareness and new guidelines there were fluctuations in the number of patients who developed pressure ulcers while under clinical supervision in an acute hospital, and this hospital acquired figure has failed to drop below 50% of all ulcers encountered.
5	Tatiane De Aquino Bandeira	Retrospective study	Patient record (Total patients 2385)	2006	The result from this study depict that Intensive care unit patients comprised 57 (59%) of the PU cases, and those on inpatient units 30 (31%). Most PUs were found in the sacral region (88%); 30 (31%) of the PUs were stage II; and 22 (23%) were Stage I. Preventive measures included patient repositioning (n = 74) and use of moisturizers (n = 69).
6	Gerrie J.JW.Bours	Cross sectional study	76 Acute care hospital	2004	The result from this study states that the prevalence of pressure ulcers decreased over the 5-year period, while the percentage of patients receiving adequate prevention and the total number of enabling conditions present increased.
7	Lena Gunningberg	Cross sectional study	413 Inpatient records	2004	The result from this study states that the overall prevalence of pressure ulcers obtained by audit of patient records was 14.3% compared to 33.3% when the patients' skin was examined. The lack of accuracy was most evident in the documentation of grade 1 pressure ulcers. The quality of the nursing documentation of pressure ulcer (n = 59) was generally poor.

Lorenzo Right et al (2017) Conducted a prospective longitudinal study on effect of a pressure ulcer audit and feedback regional program at 1 and 2 years in nursing homes :. In this study 27 nursing homes participated in the program in2015 and 2016 (4607pts) and 15 continued in 2017 (1357pts). The nursing homes received 2 years training in data reporting. The Braden scale is a tool to predict pressure ulcer examine by examine six criteria; sensory perception, moisture, activity, mobility, nutrition and friction. And for prevention four prevention measures were considered: oral nutrition supplements, patient reporting, presence of an anti-decubitus or mattress and moisturizing cream. 6 nursing homes participated only in 2015 and were thus excluded from the analysis. 12 participated in 2015 and 2016 and 15 participated

from 2015 to 2017. The 12 nursing homes participated for 2 years and had 994 patients in 2015 and 970 in 2016. The 15 nursing homes participated for 3 years had 1294, 1349 and 1357 patients in 2015, 2016 and 2017. Results show that acquired pressure ulcer prevalence reduced in nursing homes that participated during all 3 years [4.5% in 2015 to 2.9% in 2017] especially in those with more patients with pressure ulcer. The program significantly improved two preventive measures: patient repositioning and anti-decubitus bed or mattress. It also reduced acquired pressure ulcers prevalence in nursing homes that participated during all 3 years (from 4.5% in 2015 to 2.9% in 2017, $p = 0.035$), especially in those with more patients with pressure ulcers.

Ruth-Linda Hansen et al (2013) conducted cross-sectional descriptive design to describe the accuracy and quality of nursing documentation of the prevalence, risk factors and prevention of pressure ulcers, and compare retrospective audits of nursing documentation with patient examinations conducted in nursing homes. A retrospective audit of 155 patients' records and patient examinations using the European Pressure Ulcer Advisory Panel form and the Braden scale, conducted in January and February 2013. Results show that the prevalence of pressure ulcers was 38 (26%) in the audit of the patient records and 33 (22%) in patient examinations. A total of 17 (45%) of the documented pressure ulcers were not graded. When comparing the patient examinations with the patient record contents, the patient records lacked information about pressure ulcers and preventive interventions.

Asta Thoroddsen et al (2012) conducted a study on "Accuracy, completeness and comprehensiveness of the information on pressure ulcers recorded in the patient record." A cross-sectional descriptive study was performed in 29 wards at a university hospital in Iceland. The study included skin assessment of patients and retrospective audits of records of patients identified with pressure ulcers. A sample of 219 patients was inspected for signs of pressure ulcers on 1 day in 2008. Records of patients identified with pressure ulcers were audited ($n = 45$) retrospectively. Results show that the prevalence of pressure ulcers was 21%. Information inpatient records lacked accuracy, completeness, and comprehensiveness. Only 60% of the identified pressure ulcers were documented in the patient records. The lack of accuracy was most prevalent for stage I pressure ulcers.

Phillips, L., Buttery, J. (2009) undertook the clinical audit for exploring pressure ulcer prevalence and preventative care" In this study data was collected during a three-year period from up to 44 acute hospitals in England and Wales using a standardized methodology. It was collected by trust employees, usually nominated clinical nurses, working with an auditor from the company. All inpatients present at 2am on the day of the audit were included. Data covering the nine-month period before the NICE guidelines (2005) were introduced, through the post-guideline period, and into 2007 were analyzed. The findings were analyzed to compare pressure ulcer prevalence with the implementation of NICE guidelines on managing pressure ulcers. The result shows that despite increased awareness and new guidelines, the three-year audit data indicates a relatively static overall prevalence of 10.2%-10.3%. The audit uncovered areas where care appears to fall below expected standards, which may partly explain continuing high prevalence rates.

Tatiane De Aquino Bandeira et al (2006) conducted a retrospective study to review nursing documentation related to pressure ulcers contained in medical records of patients hospitalized at São Paulo Hospital (HSP), a university hospital in Brazil. In this study the HSP has 743 beds, of which 651 are for adults and 92 for children. The nursing audit at HSP was started in 2006 in order to achieve the objectives set by the City and State of São Paulo Management Offices. Three objectives were set regarding nursing practice: 1) to perform a nursing audit in 5% of hospital discharge summaries and 30% of death certificates; 2) to evaluate the nurses' compliance to the nursing care plan (NCP); and 3) to assess patient safety indicators. During 2009, 170 hospital discharges and 1,434 deaths were reported at HSP. A total of 2,385 patient reports were audited and 684 patients were considered at risk for pressure ulcers according to the Braden Scale, of which 118 developed pressure ulcers. A data collection instrument was used to register information about patient identification, demographic information, nutritional status, Braden Scale scores, risk factors for pressure ulcers (e.g. Mechanical ventilation, sedation, hyperthermia, urinary incontinence, and fecal incontinence) pressure ulcer staging (according to the classification of the National Pressure Ulcer Advisory Panel [NPUAP]), and preventive measures (e.g. use of convoluted foam mattress pad, heel protectors, cushions, timer with alarm attached to the bed to indicate the time for patient repositioning, skin barriers, and skin moisturizers). Results show that the mean age of the patients was 69.5 ± 16 years (range 18-100 years), and the mean length of hospital stay was 36.2 days (range 1-100 days). Intensive care unit patients comprised 57 (59%) of the PU cases, and those on inpatient units 30 (31%). Most PUs were found in the sacral region (88%); 30 (31%) of the PUs were stage II; and 22 (23%) were Stage I. Preventive measures included patient repositioning ($n = 74$) and use of moisturizers ($n = 69$). It was found that 87 (89.7%) patients who developed pressure ulcers were not assessed at admission for risk of pressure ulcers, 62 (63.9%) were assessed at prescription of preventive interventions, 48 (49.4%) at diagnosis of pressure ulcer, and 61 (62.8%) at hospital discharge or death.

Gerrie J.J W. Bours et al (2004) conducted study on "A pressure ulcer audit and feedback project across multi hospital setting in the Netherlands". In this study five annual national surveys were carried out between 1998 and 2002, involving systematic data collection to assess the prevalence of pressure ulcers in various health care settings and various patient groups. Each patient had to be examined by two nurses, one from the patient's own ward and one who was unfamiliar with the patient, to ensure reliability. The majority of the settings in the national surveys were acute care hospitals. A total of 76 acute care hospitals participated voluntarily in the five surveys. Hospitals that participated more than once during these 5 years were compared between surveys to determine what changes had occurred over time in the prevalence and management of pressure ulcers. The data collection instrument designed for this study was based on a

literature review and a Delphi panel with 34 experts in the field of pressure ulcers. The instrument was field tested in an acute care hospital, a nursing home, and a home care agency, and was found to be reliable and feasible. Result shows that the quality of care had improved over the 5 survey years, as the prevalence of pressure ulcers had decreased, while the total number of enabling conditions present and the percentage of patients receiving adequate prevention had increased.

Lena Gunningberg et al (2004) conducted study to determine the accuracy and describe the quality of nursing documentation of pressure ulcers in a hospital care setting. A cross-sectional survey was used comparing retrospective audits of nursing documentation of pressure ulcers to previous physical examinations of patients. All inpatient records (n = 413) from February 5, 2002, at the surgical/orthopedic (n = 144), medical (n = 182), and geriatric (n = 87) departments of one Swedish University hospital. The European Pressure Ulcer Advisory Panel data collection form and the Comprehensiveness In Nursing Documentation. All 413 records were reviewed for the presence of notes on pressure ulcers; the findings were compared with the previous examination of patients' skin condition. Records with notes on pressure ulcers (n = 59) were audited using the European Pressure Ulcer Advisory Panel and Comprehensiveness in Nursing Documentation instruments. The overall prevalence of pressure ulcers obtained by an audit of patient records was 14.3% compared to 33.3% when the patients' skin was examined. The lack of accuracy was most evident in the documentation of grade 1 pressure ulcers. The quality of the nursing documentation of pressure ulcers (n = 59) was generally poor. Patient records did not present valid and reliable data about pressure ulcers

APPRAISAL OF THE STUDIES

STUDY DESIGN

Out of the 7 studies included in this review, five are cross sectional descriptive studies, one is prospective longitudinal study and one is retrospective study. All these studies addressed the clinical audit on prevention of pressure ulcer in immobile patients.

SAMPLE

Jeanne Young(2005) suggest that carefully description of study participation setting sample selection and size should be reported . The authors state that descriptions of study participants' characteristics and setting in which they were studied are necessary so that readers can assess generalizability of the results of the study. The authors also explain that description of sample selection and size helps the readers to detect internal validity associated with ascertaining statistically significant and clinically important differences of a given size if such differences exist. Investigators for all the seven studies reported participants, setting, sample size in their studies.

DATA COLLECTION

Relevant data for the selected studies were collected from different database like NCBI, PubMed, Researchgate.net, Google scholar.

RESULTS

There is a wide variability of data reported in the 7 selected studies. All the studies gave the evidence that patient records lacked information about pressure ulcers and preventive interventions and the audit uncovered the areas where care appears to fall below expected standards.

DISSCUSSION

The systematic review of learning literature in this study talks about the interventions been done for the prevention of pressure ulcers. Out of 7 studies, 4 studies suggest that the information in patient records about pressure ulcers were lacked accuracy, completeness and comprehensiveness. The quality of the nursing documentation of pressure ulcer was generally poor. Two studies gave evidences that the patient had received adequate preventive measures i.e. (mattress pad, heel protector, cushion timer with alarm to the bed, skin moisturizers) and remaining one study also depicts that patient who developed pressure ulcers were not assessed at admission for risk of pressure ulcers, and were assessed at prescription of preventive interventions, And the preventive measures for pressure ulcers were patient repositioning and use of moisturizers.

CONCLUSION

Reviews from these studies conclude that the purpose of documentation to record, communicate and support the flow of information in the patient record was not met. The patient records lacked accuracy, completeness and comprehensiveness, which can jeopardise patient safety, continuity and quality of care. The information on prevention of pressure ulcers in patient records was found not to be a reliable source for the evaluation of quality in health care. To improve accuracy, completeness and comprehensiveness of data in the patient record, a systematic risk assessment for pressure ulcers and assessment and treatment of existing pressure ulcers based on evidence-based guidelines need to be implemented and recorded in clinical practice.

RECOMMENDATIONS

- More studies should be conducted on clinical audit.
- Studies can be conducted on intervention of pressure ulcer.
- Clinical audit on prevention of pressure ulcer can be conducted in our country.
- Further studies are needed for the amount of time spent by the nurses for indirect care activities.
- Further studies are needed to maintain accuracy in nursing documentation for prevention of pressure ulcer.

REFERENCES

1. National Pressure Ulcer Advisory Panel [Internet]. Washington (DC): NPUAP. Press release, National Pressure Ulcer Advisory Panel (NPUAP) announces a change in terminology from pressure ulcer to pressure injury and updates the stages of pressure injury; 2016 Apr 13 [cited 2018 Sep 27].
2. Strengthen Patient Care by Reducing Hospital Acquired Pressure Ulcers (HAPU)- Nihar Bhatia Head Quality Assurance & Fortis Operating System and Prateem Tamboli, Facility Director, Fortis Escorts Hospital Jaipur
3. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance (2014) Prevention and treatment of pressure ulcers: clinical practice guideline.
4. National Clinical Guideline Centre (UK). The Prevention and Management of Pressure Ulcers in Primary and Secondary Care. London: National Institute for Health and Care Excellence (UK); 2014 Apr. (NICE Clinical Guidelines, No. 179.) 6, Pressure ulcer prevention. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK333117/>
5. Slawomirski L, Auraen A, Klazinga N (2017) The economics of patient safety strengthening a value-based approach to reducing patient harm at a national level. OECD, Paris, France
6. Díaz-Caro I, García Gómez-Heras S (2020) Incidence of hospital-acquired pressure ulcers in patients with "minimal risk" according to the "Norton-MI" scale. PLOS ONE 15(1): e0227052. <https://doi.org/10.1371/journal.pone.0227052>
7. Chauhan VS, Goel S, Kumar P, Srivastava S, Shukla VK. The prevalence of pressure ulcers in hospitalised patients in a university hospital in India. *J Wound Care*. 2005;14(1):36-37. doi:10.12968/jowc.2005.14.1.26724
8. Renu B. Pattanshetty, Pooja M. Prasade, Aradhana K.M. - Risk assessment of decubitus ulcers using four scales among patients admitted in medical and surgical intensive care units in a tertiary care set up: a cross-sectional study. *Int J Physiother Res* 2015;3(2):971-977. DOI: 10.16965/Ijpr.2015.117
9. A Practical Guide to Clinical Audit: Quality & Patient Safety Directorate Dr. Steevens Hospital Dublin 8, QPSD-D-029-1, August 2013
10. Zuo, Xiao-Lin & Meng, Fan-Jie: A care bundle for pressure ulcer treatment in intensive care units: *International Journal of Nursing Sciences*2(4). November 2015
11. Lorenzo Righietal (May 29,2020) Effect of a pressure ulcer audit and feedback regional program at 1 and 2years in nursing homes:A prospective longitudinal study, :<https://doi.org/10.1371/journal.pone.0233471>
12. Ruth Linda Hansen, Mariann Fossum (2016 march) Nursing documentation of pressure ulcer in nursing homes: comparison of record content and patient examination: John Wiley and sons Ltd..PMID: 27708826
13. Rosalind Elliott etal (July 2008) Quality improvement program to reduce the prevalence of pressure ulcers in an intensive care unit, *American journal of critical care: an official publication: American association of critical care nurse*.<https://doi.org/10.4037/ajcc2008.17.4.328>
14. AstaThoroddsenetal (2015) Accuracy,completeness and comprehensiveness of information on pressure ulcer recorded in the patient record, *Scandinavian journal of caring science*: .<https://doi.org/10.1111/j.1471-6712.2012.01004.x>
15. Tatiana de Aquino Bandeira et al (2014) Pressure ulcer in a university Hospital: A review of nursing records, : <https://www.woundsresearch.com/article/online-exclusive-pressure-ulcers-university-hospital-review-nursing-records>
16. Phillips, Lyn & Buttery, Jill. (2009). Exploring pressure ulcer prevalence and preventative care. *Nursing times*. 105. 34-6. https://www.researchgate.net/publication/26251155_Exploring_pressure_ulcer_prevalence_and_preventative_care
17. Gerrie JJ W.Boursetal (2004) A pressure ulcer audit and feedback project across multi hospital setting in the Netherlands, *International journal for quality in health care* vol.16, : <https://doi.org/10.1093/intqhc/mzh034>
18. Lena Gunningberg (2004) Accuracy and quality in the nursing documentation of pressure ulcers : a comparison of record content and patient examination , *Journal of wound, ostomy, and continence nursing* : official publication of The Wound, Ostomy and Continence Nurses Society / WOCN:<https://pubmed.ncbi.nlm.nih.gov/15867708/>