

Does the implementation of skin bundles reduce the incidence of medical device- related pressure injuries?

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Introduction

In 2016, the term MDRPI or Medical Device-related Pressure Injury was introduced by the National Pressure Ulcer Advisory panel as a revision for the definition for pressure injury. 30% of Pressure injuries are related to medical devices. MDRPIs are different from usual pressure ulcers as they may occur even when not in contact with bony prominences. MDRPI are caused by the pressure applied by medical devices used for treatment or diagnostic purposes and may occur in any areas in contact with these devices. With the coining of the term MDRPI, it shifts the focus of the caregiver to the bodily areas in contact with medical devices. MDRPIs cost the healthcare system money and time. In regards to the patient , psychological and emotional costs are often present and as majority of MDRPIs occur in the face and neck, the long term impact on the well being of a patient with MDRPIs can be devastating. With this, efforts to enforce proper prevention of MDRPIs must be explored (Alvez, et.al., 2020)

Search Strategy

Keywords:

Prevention
Medical device/
medical devices
Pressure injury/
pressure ulcer
Intensive care unit
Adult
Nurses/Nursing

CinaHL, Pubmed, Science
Direct studies
n= 52

In english, done in the last
10 years (2014-2024)
n= 51

Included after reading
headline
n=28

Abstract screened
n=16

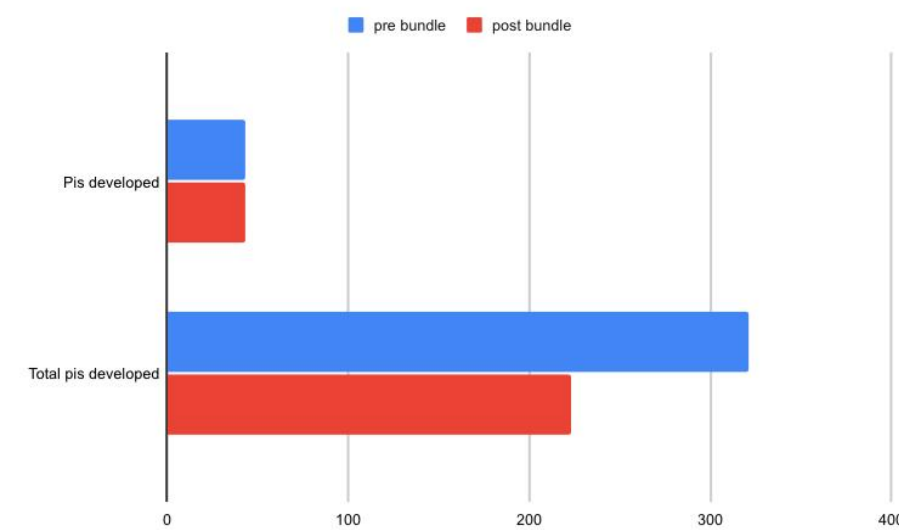
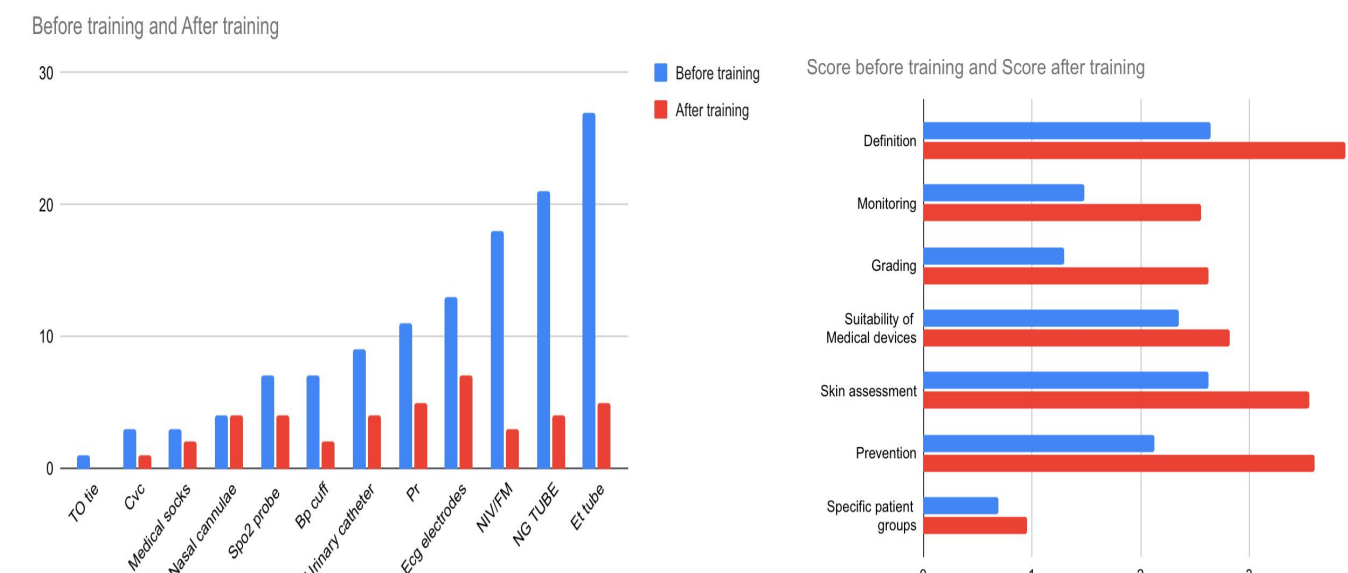
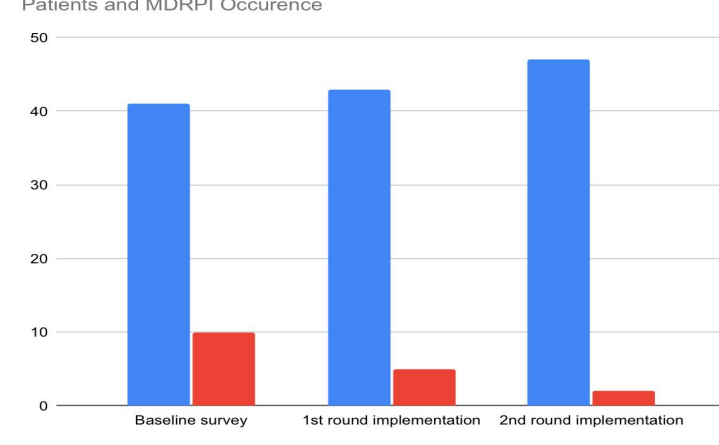
Full articles read and
deemed relevant
n=3

Inclusion/ Exclusion Criteria

INCLUSION	EXCLUSION
English language	Non-English text
Scholarly, peer-reviewed journals	Dissertations, discussion papers, literature reviews, unpublished articles
Published between 2014-2024 to reflect recent, current, updated practices	Articles over 10 years old
Full article available	Only abstract available
Articles that focus on the incidence and risk factors of developing MDRPIs	Articles that focus on the prevention of MDRPIs



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Study	Population	Inclusion/ Exclusion Criteria	Intervention	Findings	Limitations
The Effectiveness of the SKINCARE Bundle in Preventing Medical-Device Related Pressure Injuries in Critical Care Units: A clinical trial - Aguilar, Et. Al. 2021 - Single arm, open-label clinical design - Saudi Arabian tertiary hospital from January- April 2020 - Ethical approval obtained from director of nursing administration and ethics unit of relevant hospital. Written consent also obtained from patient/ family members	223 patients met the study inclusion criteria 60% was male - Risk assessment scale scores showed the majority of the participats are at high risk of Pi development	<u>Inclusions:</u> - Expected length of stay in CCUS of more than 24 hours <u>Exclusions:</u> - Medically contraindicated - removal, repositioning, or change of medical device - Refusal of SKINCARE bundle interventions	The SKINCARE mnemonic was implemented. It contains the best available evidence and latest international guideline for reducing MDRPIs. It consists of essential strategies for PI developmeng such as nursing clinical assessment and documentation, hygiene measures, repositioning, and emerging therapy for MDRPI prevention for critically ill patients in the ICU	When compared with the baseline data in the hospital provided by the National Database Nursing Quality Indicators, there was a statistically significant difference in the total of PIs that developed (13.4%, 43/321) and after (0.89%, 43/223) bundle implementation (P value= 0.001) indicating the likelihood of MDRPI development to be 90% lower following the implimentation of the SKINCARE bundle. 	- Was conducted in a single population (CCU patients) - Some data was collected retrospectively which may not be completely accurate Recommendations: - Testing the bundle in a different organisation - A pre-intervention data would give a frame of reference for comparison
Medical Device- Related Pressure Injury Care and Prevention training Program (DevlCeU): Effects on intensive care nurses' knowledge, prevention performance and point prevalence - Dalli, O.E., and Girgin, N. K. (2024) - Pre- post test intervention study without a control group - Approval was obtained	Nurses in 4 ICUs : total of 112 nurses Patient sampling was conducted using a convenience sampling method	<u>Inclusions for patients:</u> 18 years old or older - Planned to be monitored for more than 24 hours - had medical devices <u>Exclusions for patients:</u> - had MDRPIs when admitted to the ICu from an external center - not stable enough to allow repositioning for skin examination were excluded	A pre-test was done to assess the nurses' knowledge on MDRPI prevention. A 10-day training session was held and then a post test was done to know the MDRPI prevalence and the knowledge of the nurses in preventing MDRPIs.	The first graph indicates the incidence of MDRPI pre and post intervention. 2nd table indicates the comparison of ICU Nurses knowledges and DEVICE performance score pre and post training. All scores in the 2nd table has a pvalue of 0.01 which means all are statistically significant 	- it was conducted as in a single center - it contains only a small amount of nurses - the long term impact of the training is not known - the interval between the two prevalence studies is short - not all nurses are included in the prevalence study - since the nurses are aware that the study is being conducte, there might be a hawthorne effect in which they changed their attitudes
Implementation of evidence in preventing medical device-related pressure injury in ICU patients using the PARIHS framework - Bo et.al. (2021) - Jiangsu, China - Ethics Board approved	31 nurses participated and 131 patients were included	<u>Inclusions(nurses):</u> - Working in the ICU for more than 6 months - With a nurse practice certification <u>Exclusions(nurses):</u> - not providing consent to participate <u>Inclusions(patients):</u> - newly admitted ICU patients - aged > 18 years old - using a medicfal device	An evidence evaluation meeting was held with senior members of the team. A scale was used to evaluate feasibility, appropriateness, meaningfulness, and effectiveness of the evidence being implemented. After 2 rounds of evidence implementation, a questionnaire survey was implemented.	The total scores on MDRPI prevention knowledge among the ICU nurses were statistically significant with a p value of <0.001 . The difference between the baseline surveyr group and first-round implementation froup was staistically significant with a p value of <0.05 . The difference between the 1st and 2nd round implementation group was statistically significant at P=<0.05 . A Statistically significant difference was also seen between the second round implementation group and baseline surveyr group with p value= <0.05 . 	- The sample size was limited by objective difficulties in collecting the data during evidence implementation - Only conducted in one ICU setting - Hawthorne effect could not completely be avoided due to the prescence of observers - Effect of the implemented evidence over time is not known

Discussion

In these 3 studies, a framework to improve the prevention of MDRPI practices were implemented. All of the studies presented a lowered incidence of MDRPI occurence in the patients that were included in the study groups. As the MDRPI term is relatively new (coined in 2016 as separate from pressure ulcers), new studies are continuously coming out and practices are always being improved. There are a large number of studies that focus on the incidence and risk factors of developing MDRPIs but only a few touch on the prevention itself. In these 3 studies, training and education of staff results in significantly improved outcomes for patients at risk for developing MDRPIs.

There were 3 different skin bundles that were used in these 3 studies but the universal consensus was that a systematic implementation of a standardised bundle lower the incidence of MDRPIs occuring. With the psychological, emotional, and physical stress this may add on to an already stressful ICU stay, every bit of help with prevention can mean a lot to a patient's wellbeing in the long run.

Conclusion/ Recommendation

In future studies, the implementation and assessment of just one unified skin care bundle mightb be beneficial. In all these 3 studies, only one centre was assessed. It might be more accurate to have more than one centre for a study to be done to assess multiple work cultures and their attitudes towards preventing MDRPIs. A larger study size was considred a limitation in all 3 studies. 2/3 studies has said that a Hawthorne effect cannot completely be ruled out so a control group may be able to help fix this problem. A longitudinal study may also be done in the future as to evaluate the difference these practices make over time.

References

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