Clarifying Repositioning in a Pressure Injury Context: A Scoping Review

Abdulkareem S. Iblasi, Yupin Aungsuroch, Joko Gunawan, I Gede Juanamasta*

Abstract: Repositioning immobilized individuals offloads pressure over the tissues and facilitates blood supply, preventing pressure injury. However, there is a gap in clarifying the practice of repositioning or standardizing the repositioning practice measurements. This scoping review aimed to clarify modes of assessing repositioning. PRISMA-ScR was used as a guideline to report the study, and The Joanna Briggs Institute Manual of Evidence Synthesis was used to conduct the scoping review. Manuscripts published between 2009 and 2021 were identified in the following databases: Cochrane Wounds Group Specialized Register, Ovid MEDLINE, EBSCO CINAHL, Clinical Key database, and Ovid MEDLINE (in-process & non-indexed citations, Jan 2009-Jan 2021), in addition to the reference sections of the potentially relevant studies. This review included English-language, interventional and non-interventional studies, department and healthcare facility reports with full-text content. This review excluded economic reviews, qualitative studies, systematic reviews, and studies that did not focus on the procedure being performed by nurses. The STROBE checklist and Downs and Black's quality assessment process were applied to check the quality of the reported article. Twenty-four studies were analyzed, four randomized, five non-randomized, and 15 had cross-sectional designs. The most common mode for measuring repositioning compliance was a chart review, used in 11 studies, followed by digital observation used in five studies; four used observation, and four used self-administered questionnaires. No measurement tool could address all issues with the accuracy and dependability of measurements. The review considers the need for a new standardized repositioning measurement instrument.

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Background

Repositioning is a harmonized frequent turn for bedridden patients that ends by fixing the patient's posture at a new position and documentation of the action.[1] In hospitals, nurses must repeat this intervention every two to six hours.[2] Repositioning reduces the chance of pressure ulcer development.[3, 4] However, lacking

a standardized evaluation tool complicates nurses' ability to evaluate the repositioning performance, which limits their ability to ensure appropriate pressure ulcer prevention measures.[3]

Experts present different kinds of measurements either for evaluating the repositioning performance or ensuring proper pressure injury prevention, including assessing the repositioning. These tools vary in their types, calculations, or measurement purposes.[5-7] However, these measurement tools leave several issues unresolved. This study undertook a scoping review of the published literature exploring repositioning measurement tools and suggests a categorization and evaluation. The hope is to get nurses to think about which measurement they would use or importantly to consider developing new tools and insights for managers to evaluate the repositioning performance while maintaining their pressure injury prevention activities.

Literature Review

Repositioning redistributes pressure and minimizes the chance of pressure injury development.[8] Reviews of pressure ulcer prevalence showed a strong correlation between repositioning practice and pressure ulcer prevention,[9-11] which highlights the critical importance of correct repositioning for immobilized individuals.[1] However, studies show inconsistency with repositioning recommendations.

One study revealed that approximately 7.9% of patients received a kind of repositioning which is also associated with a high-pressure ulcer prevalence rate,[12] and Norton[13,14] suggested that the two-hourly standard is the golden evaluation for repositioning. However, experts have failed to clearly describe how to ensure the intervention happens during these two hours or any other time limits.[11,14,15] Lacking a standard for measuring the nursing performance for repositioning is an opportunity to improve pressure ulcer prevention.[11,14,15] There are gaps in assessing nursing repositioning. So, the need to follow up on the performance of repositioning for the quality of quantity leaves space for nurses, researchers, and managers to develop several methodologies to estimate the performance in doing the repositioning.[16] Available evidence shows the importance of using a risk assessment tool[17] and implementing plans of PI prevention strategies[8] alongside methods and clinical forms for estimating the nursing performance in these matters.

Measurement Error

Groves and Lyberg [18] defined measurement errors as conceptual maps to perceive the possibilities of errors from measurements. Our current review reviewed studies based on three prominent measurement errors; errors of non-observation, errors of observations, and processing errors[19] as seen in **Table 1**. Errors of non-observation refer to coverage errors, sampling errors, and non-response errors. Coverage errors mean the sampling techniques are unable to represent all population members. In contrast, sampling errors refer to a selection problem that includes participants out of the targeted populations. Non-response errors refer to difficulties in completing the required information. For example, participants may feel uncomfortable answering some personal or sensitive issues, so they leave a question unanswered.[18]

Table 1. Total measurement errors

Study	Total measurement errors						Measurement mode
	Errors of non-observation			Errors of observation	Errors of processing		
	Coverage errors	Sampling errors	Non response errors	Survey or tool	Editing	Coding	
Webster et al., 2017	High	High	High	Not deducted (Reliability not assessed)	Not deducted	Not deducted	Chart review

Table 1. Total measurement errors (Cont.)

Study	Total measurement errors						Measurement mode
	Errors of non-observation			Errors of observation	Errors of processing		
	Coverage errors	Sampling errors	Non response errors	Survey or tool	Editing	Coding	
Wogamon, 2016	High	High	High	Not deducted (Reliability not assessed)	Not deducted	Not deducted	Chart review
Chaboyer et al., 2016	High	High	High	Not deducted (Reliability not assessed for repositioning)	Not deducted	Not deducted	Chart review
Hall & Clark, 2016	Low	Moderate	High	Low	Moderate	Moderate	Observation
Tayyib & Coyer, 2017[b]	Moderate	Low	Low	Moderate	Moderate	Moderate	Digital observation
Schutt et al., 2018	Low	Low	Low	Low	Moderate	Moderate	Digital observation
Gunningberg et al., 2017	Low	Low	Low	Low	Moderate	Moderate	Chart review
Renganathan et al., 2018	Low	Low	Low	Low	Moderate	Moderate	Digital observation
Mehta et al., 2015	High	High	High	Not deducted (Reliability not assessed for repositioning)	Not deducted	Not deducted	Chart review
Sving et al., 2014	Moderate	High	High	Not deducted (Reliability not assessed "only planned to do")	Moderate	Not deducted	Chart review
Courvoisier, Righi, Béné, Rae, & Chopard, 2018[a]	High	High	High	Not deducted (Reliability not assessed for repositioning)	Not deducted	Not deducted	Chart review
Källman et al., 2016	Low	Low	Low	Low	Moderate	Moderate	Digital observation
Tannen et al., 2009	Low	Moderate	High	Moderate	Moderate	High	Chart review
Rich et al., 2011	High	High	High	Not deducted (Reliability not assessed for repositioning)	Not deducted	Not deducted	Chart review
Tayyib et al., 2013	Moderate	Moderate	Low	Low to moderate	High	Low	Observation
Moya-Suárez et al., 2017	Low	Low	Low	Low	Low	Low	Chart review
Meester berends et al., 2013	High	Low	High	Low	Low	Not deducted	Chart review
Kalisch et al., 2014	Low	Low	High	Low	High	High	Self-administered questionnaire
Kalisch et al., 2011	Low	Low	High	Low	High	High	Self-administered questionnaire

Table 1. Total measurement errors (Cont.)

Study	Total measurement errors						Measurement mode
	Errors of non-observation			Errors of observation	Errors of processing		
	Coverage errors	Sampling errors	Non response errors	Survey or tool	Editing	Coding	
Hanna et al., 2016	Low	Moderate	Moderate	Low	Low	Low	Self-administered questionnaire
Beeckman et al., 2011	Low	Low	High	Low	Moderate	Moderate	Chart review
Sving et al., 2012	Moderate	Low	Low	Low	Not deducted	Not deducted	Observation
Peterson et al., 2013	High	Low	Low	Moderate	Moderate	Moderate	Digital observation
De Meyer et al., 2019	High	Low	Low	Moderate	Moderate	Moderate	Digital observation

Errors of observation refer to the possibility of developing measurement bias related to the nature of the applied tool. Errors of processing refer to editing or coding the data.[18,19] Analysis revises the studies for possible mistakes (each separately) and the usefulness of techniques to identify and deal with these issues. Analysis classifies the studies into three levels based on the expected measurement errors: high, moderate, and low. High refers to the possibilities of massive measurement errors in the used techniques.[19]

Methods

The Joanna Briggs Institute Manual of Evidence Synthesis[20] was used to conduct the scoping review, including (1) defining the objective, (2) aligning inclusion criteria, (3) approach for searching, selecting, and extracting articles, (4) analyzing evidence, (5) presenting results, and (6) summarizing the evidence.[21] We extracted manuscripts published between 2009 and 2021 after searching in Cochrane Wounds Group Specialized Register, Ovid MEDLINE, EBSCO CINAHL, Clinical Key database, and Ovid MEDLINE (in-process and non-indexed citations, Jan 2009-Jan 2021), in addition to the reference lists of the included studies that presented a measurement for repositioning. The searched words were pressure ulcer/injury, repositioning, turning, position,* repo,* and complia.* (See **Figure 1**).

Inclusion and exclusion criteria: This review included all interventional or non-interventional studies found that reported an approach for measuring repositioning. This review excluded economic reviews, qualitative studies, systematic reviews, and studies that did not focus on the procedure being performed by nurses. Cohort studies were included if they outlined an assessment method and had written an evaluation of this. Also, studies were included in any healthcare facility where nurses repositioned for pressure injury prevention. There was no limitation on the type of hospital or nursing home facility. No limits were placed on the kinds of interventions applied to measure repositioning. Further, either the primary or secondary study outcome had to measure repositioning. Lastly, the study was full text reported and written in English.

Data collection and analysis

Study selection: Two reviewers assessed the titles and abstracts of studies retrieved from the database search (**Figure 1**). Headings of all studies that matched the criteria were included on a spreadsheet to facilitate easy access to the texts. We recorded reasons for exclusion and were not blinded to study authorship. We also reviewed the reference lists in the studies to identify any additional studies that matched the selection criteria, and repositioned score and computing methods. In case of a vague calculation method, the reviewers sent an email to the corresponding authors, Tayyib and Coyer[22] who responded with detailed information about measurement modes.

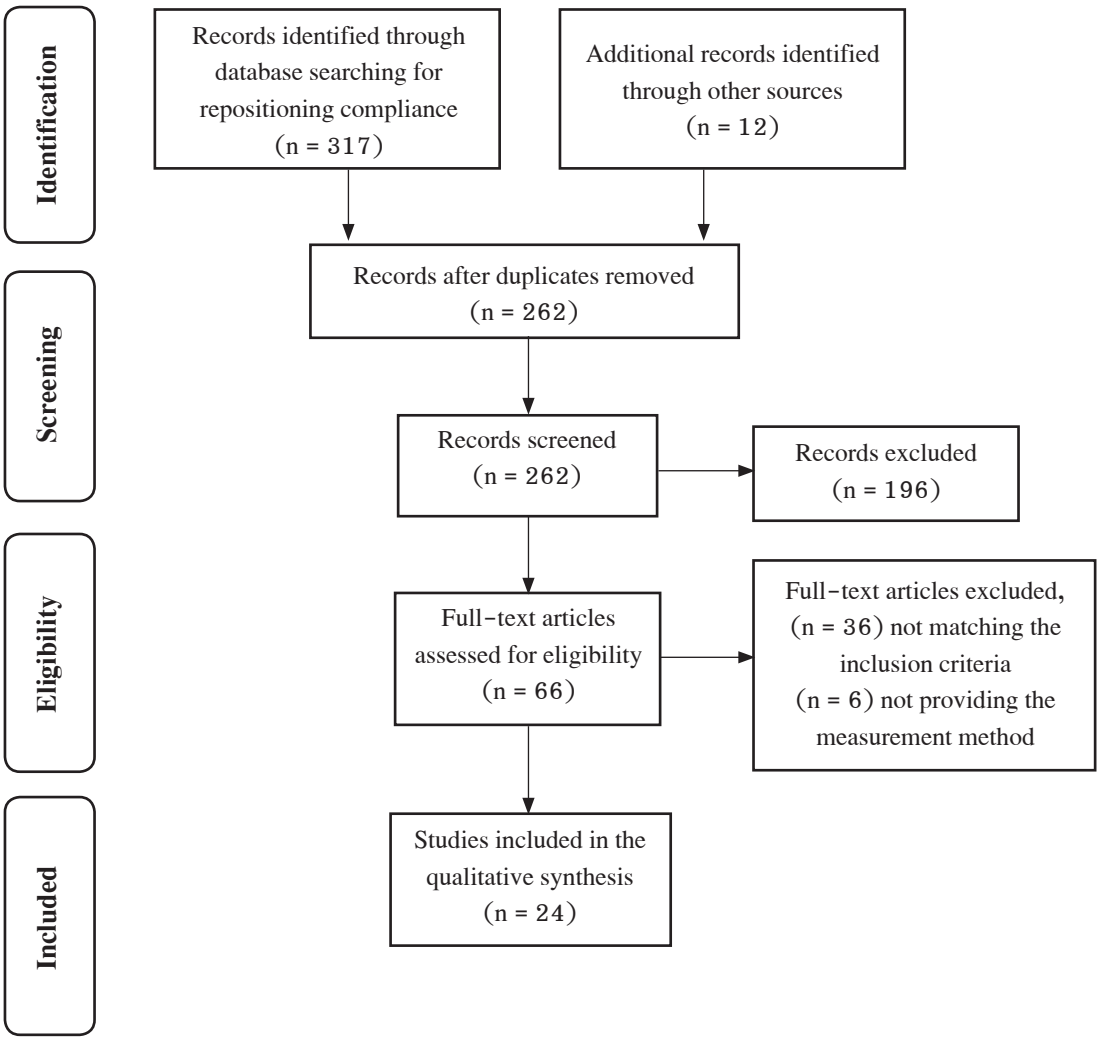

Figure 1. PRISMA Chart

Data extraction and management: After evaluating all retrieved studies and determining which analyses to include based on the agreed criteria, two reviewers individually extracted data onto a predesigned data extraction sheet. They discussed analyses until they reached an agreement if they had different results. The data extraction and analysis were based on the content of each study (see **Table 2**).

Assessment of risk bias in inclusion: Two reviewers independently assessed the risk of bias in the selected studies by applying the Cochrane Risk of Bias tool.[23] Downs and Black's[24] quality assessment was used for experimental studies (**Appendix 1**), and the STROBE guidelines were applied to write the report of the review, consisting of 22 questions with the answer yes or no.[25] Downs and Black's checklist[24, 26] was used to assess the quality of non-randomized and randomized interventions. This checklist contains 28 questions, scoring 1 (yes) and 0 (no), except item number 5 which is ranked 2 (yes), 1 (partially), and 0 (no). A study that is not randomized can be seen in questions 23 and 24 related to random allocation and

a concealed intervention to the patient and staff. The final scores range from excellent (26-28), good (20-25), fair (15-19), and poor (<14).[26, 27]

Assessment of heterogeneity: We planned to explore clinical heterogeneity by examining potential influencing factors, such as the nursing unit, nurses' characteristics, the study country of origin with different health standards for pressure injury, and patient parts.[23] However, given the nature of the selected studies, statistical heterogenicity was not relevant because each study adopted a different measurement methodology.

Sensitivity analysis: We planned to include all eligible studies in the initial analysis and conduct sensitivity analyses to evaluate the effect of the defined bias. We agreed to exclude studies with a significant risk of bias as identified by the bias assessment, such as studies that did not provide the methods used for calculations or had uncertain outcome assessments.

Table 2. Summary of the selected studies

Author	Country of origin	Population	Number and type	Design	Instrument name	Method for assessing repositioning compliance
Webster	Australia	Patients who developed a pressure injury in hospital	N = 133 Surgical: 58 Medical: 73 Cancer: 2	Retrospective cohort	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Wogamon	USA	Nurse assistants (CNAs) working in nursing homes	N = 33 All in nursing homes	Non-randomized trial	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Chaboyer	Australia	Adult patients at risk for Pressure Ulcer	N = 1,598 (Intervention = 799 Control = 799) Surgical: 548 Medical: 1,021 Cancer: 29	Clustered randomized trial	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
(Hall & Clark, 2016)	USA	Adult patients at risk for PU in hospitals	N = 100 Intervention = 50 Control = 50	Non-randomized trial	Prevalon Turn and Positioning Sys- tems® 2.0 [TAP], Sage Products, Cary, IL	Observed the amount of time by stop watch
Tayyib & Coyer	Saudi Arabia	Adult patients in an Intensive care unit	N = 140 Intervention = 70 Control = 70	Clustered randomized control trial	No name – Observation sheet	Observed the number of times nurses performed a turn using a purposefully built data monitoring tool
Schutt	USA	Medical units in a community hospital	N = 138 Preintervention = 75 Postintervention = 63	Non-randomized pre/postintervention study	Leaf Healthcare, Pleasanton, CA, USA	Captured continual movements from the sensors for all patients in the study every 10 seconds and imported the data to a customized reporting tool
Gunningberg	Sweden	Geriatric/ internal medicine ward	N = 190 patients Intervention = 91 Control = 90	Pragmatic Randomized Control Trial	MAP System, Wellsense USA, Inc	Observed the number of times nurses performed a turn using a purposefully built data monitoring tool

Table 2. Summary of the Selected Studies (Cont.)

Author	Country of origin	Population	Number and type	Design	Instrument name	Method for assessing repositioning compliance
Renganathan	India	Intensive care unit	N = 47 Intervention = 25 Control = 22	Non-randomized control	PRESENSE system capture a patient's movement and position	Changes in the patient's position reflected compliance for the protocol
Mehta	India	Hospitalized adult patients	N = 358	Descriptive cross-sectional study	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Sving	Sweden	Hospitalized adult patients	N = 825	Descriptive cross-sectional study	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Courvoisier, Righi, Béné, Rae, & Chopard	Switzerland	Adult patients in nursing homes in Switzerland	N = 2,671	Descriptive cross-sectional study	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Källman	Sweden	Adult patients at risk for PU development in nursing homes	N = 52	Non-experimental observational cross-sectional design	MovinSense (MiS) care management system (Kinematix, Porto, Portugal	The measurements follows the patient's movements
Tannen	Germany and the Netherlands	Adult patients admitted in hospitals and nursing homes	N = 36,957	Cross-sectional	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Rich	USA	Elderly patients with hip fracture	N = 269	Cohort study	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Tayyib et al.	Saudi Arabia	Intensive care patients	N = 28	Prospective observational	No name – data extraction sheet	Observed the number of times nurses performed a turn using a purposefully built data monitoring tool
Moya-Suárez et al.	Spain	Nurses in nine hospitals	N = 249	Cross-sectional	QARPPU	Self-administered questionnaire
Meesterberends et al.	Germany and the Netherlands	Patients in nursing homes	N = 547	Cohort Study	No name – data extraction sheet	Chart review using a purposefully built data extraction tool
Kalisch et al.	USA	Patients in Hospital	N = 729	Cross-sectional	MISSCARE Survey–Patient	Self-administered questionnaire
Kalisch et al.	USA	Nurses in hospital	N = 4,086	Cross-sectional	MISSCARE Survey	Self-administered questionnaire
Hanna et al.	USA	Nurses in hospital	N = 429	Cross-sectional	No specific name – tool developed by author	Self-administered questionnaire

Table 2. Summary of the Selected Studies (Cont.)

Author	Country of origin	Population	Number and type	Design	Instrument name	Method for assessing repositioning compliance
Beeckman et al.	Belgium	Patients in hospital	N = 2,105	Cross-sectional	No name – clinical observation sheet	Observed the number of times nurses performed a turn using a purposefully built data monitoring tool
Sving et al.	Sweden	Nurses in hospital	N = 9	Prospective observational	No name – clinical observation sheet	Observed the number of times nurses performed a turn using a purposefully built data monitoring tool
Peterson et al.	USA	Patients in hospital	N = 23	Prospective observational	mapping system (XSENSOR Technology Corporation; Calgary, Canada	The measurements sensed the patient's gravitation pressure
De Meyer et al.	Belgium	Patients in hospital	N = 227	Randomized controlled trial	Digital PROTECT tool	Captured continual movements from the sensors for all patients in the study

Results

Results of the search strategy

The initial search identified 329 studies (317 from the electronic databases and 12 from the reference check). **Figure 1** summarizes the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow chart. Sixty-seven duplicated studies were subsequently excluded. The titles of the remaining 262 studies were reviewed, and 196 studies were excluded for not being relevant to pressure ulcer/injury prevention. Sixty-six studies were reviewed by exploring the abstract. A further 36 studies were excluded for not matching the inclusion criteria (12 evaluated repositioning among non-nursing personnel, and 24 did not present repositioning as a nursing intervention). The remaining 30 studies underwent a full-text review. Six studies did not provide the repositioning measurement tool, and e-mails were sent to the corresponding authors with no feedback. Thus, after consultation with the review team, these studies were excluded. Therefore, 24 studies were included and underwent content analysis.[5,15,22,28-48]

Description of the included studies

The included studies were published between 2009 and 2021: five studies were published in 2016; four in 2017; three in 2018, 2013, and 2011; two in 2014, and the rest published one study, included 2009, 2010, 2012, 2015, 2019. The most common study design was cross-sectional (42%; n = 10). Most studies originated in the US (33%; n = 8),[5,15,31,32,43-45,47] followed by Sweden (17%; n = 4).[33,36,38,46] There were two studies from each of the following countries: Australia,[29,30] Belgium,[48,49] Germany and the Netherlands,[39,42] India[34,35] and Saudi Arabia,[22,40] equating to 42% (n = 10) of the included studies. Finally, one study was from both Spain[41] and Switzerland.[37]

The total number of participants in the included studies was 51,943 (Mean = 2,164 SD: 7,478;

min: 9[46] max: 36,957[39]). Populations in the studies included 28,288 patients in the hospital, 18,849 patients in nursing homes, 4,773 nurses, and 33 nurse-assistants. Additionally, the majority of clinical settings were acute hospitals (54%) and followed by community hospitals (21%), nursing homes (17%), and a combination of hospitals and nursing homes (8%).

Meanwhile, the majority of measurement was chart review used by 11 studies. Five studies used digital observation, four observation, and four self-administered questionnaires.

Risk of bias

As mentioned above, relevant studies were reviewed based on Cochrane's Risk of Bias assessment.[23, 50] Most studies were rated as having a low risk of bias in the components assessed, with only four elements across the nine studies scoring at high risk. The randomization sequence generation (selection bias) showed the highest risk among the three studies.[5,31,32] Randomizing patients have a high risk to patients – as not ethically accepted to make a group of patients without repositioning. Therefore, it was not feasible. Moreover, blinding participants and personnel (performance bias) not applicable as the nurse will be aware of being doing the repositioning.[31,51] It is challenging to observe nurses' behavior without their notice; thus, we did not consider this an issue in this review.

Assessment with the STROBE tool showed 11 high-quality studies, two good, and the rest fair. Meanwhile, Downs and Black's quality assessment[24] showed three excellent studies,[28,33,48] two good,[30,51] one fair,[29] and three poor.[31,34,52]

Outcome: repositioning measurement modes

The most common mode was a chart review, used in 11 studies,[15,29,36,37,42,53-59] followed by digital observation.[5,34,38,47,48] Four studies used observation,[22,32,40,46] and four used self-administered questionnaires.[41,43-45]

Chart review: Measuring repositioning through chart review studies involved counting the number of times repositioning had been documented in the records for a given patient,[15,29,36,37,42,53-59] considering the required number per specific period (every two hours), and the ratio entries as the repositioning score. These studies used data extraction tools from the medical records. Studies did not provide further information about how these data were extracted.

Digital observation: Digital observation uses electronic sensors to measure repositioning. These devices are connected to computers. The computer translates the signals into a repositioning score that was updated for five[38] to 15 minutes.[5] Within the included studies, the devices used different operational techniques and methods of communication.

Self-administered questionnaires: The use of self-administered questionnaires involved asking nurses about their performance. These tools used repositioning as a dimension included in another construct, which measures adherence to preventing pressure ulcers (QARPPU) that have had repositioning.[41] Moreover, a study used the MISSed nursing CARE survey (MISSCARE) that provides for evaluating the amount of lost repositioning "missed repositioning."[44] Other tools for repositioning as the primary constructs developed a questionnaire to measure repositioning.[45]

Outcome: repositioning measurement errors

The review showed that nine studies were at high risk for coverage errors, seven applied chart review[15,29-31,35-37,42] and two used digital observations.[47,48] Sampling errors were high in seven studies, and all applied chart review.[15,29,36,37,54,57,59] The non-response errors showed 13 studies at high risk; 10 applied chart review,[15,29-32,35-37,39,42,49] two applied self-administered questionnaires,[43,44] and one used observation.[52]

No study showed a high risk for observation errors, however six studies did not have enough information for proper judgments. Errors of processing refer to editing or coding possibilities of errors. The study concluded three studies had a high risk of processing errors, one applied chart review[39] and two studies used a self-administrative questionnaire.[43,44]

Nine studies did not show enough information for the reviewers to make judgments.[15,29-31,35-37,42, 46]

Discussion

All studies demonstrated the importance of measuring repositioning, however there was no agreement on one repositioning measurement tool and studies that applied the same mode differed in how data were extracted and analyzed. Also, there are several challenges to the validity and reliability of collected data.

The reliability of repositioning scores by observation, chart review, and self-administrative questionnaires faces a potential for observation bias. In observation, nurses were aware that they had been observed. In the studies using a chart review, attempts to ensure reliability were nearly undetectable in the texts of the studies. For self-administered questionnaires, nurses were at risk for acquiescence biases (the tendency of nurses to agree with the researchers' purpose).[60] There are no identified techniques in the studies for eliminating these risks.

Processing errors were noticed among studies that employed digital observation. These studies tracked the patient's posture changes and defined them as repositioning. These movements cannot identify whether it happens due to repositioning or other procedures or if the individual patient activities or limited by nurses. As recorded by the system, this movement might be due to nursing action or non-nursing action, initiated for pressure injury prevention or not. This was an issue among all the devices used within the digital method. Further, digital observation systems demand plenty of resources, and applicability within ordinary hospital infrastructures is questionable.

Fundamentally, the validity of the repositioning measurement is also questionable. The primary assumption that nurses always record repositioning when undertaken contradicts arguments for chart review. For instance, mismatching between what is written and what happens in chart review cannot be detected.[43] In chart reviews, registered did not always mean completed, and written standards were not always met.[61] Furthermore, there was no agreement on the type of documents to review to assess repositioning. For example, Mehta et al. extracted the data from nursing care plans.[35] In contrast, Webster et al. and Wogamon gathered data from the patient turning charts.[29, 31] Therefore, although these studies applied the same methodology (chart review), and disagreed on the best source for locating these data. A further chart review does not allow measuring the quality of the repositioning; instead, it focuses on the quantity of repositioning only. There are potentially several places where nurses could report repositioning rather than these sheets, such as nursing progress notes or daily sheets.[61] In addition, given that the terminology used to describe repositioning was not standardized, a data collector would need to have a complete awareness of the diverse terms while conducting the chart review. Nurses might use words like positioning, change positions, or turning to refer to repositioning and this not clarified in the works of literature we reviewed.

Studies employing direct observation also raised concerns with the validity of the data. For instance, the studies did not standardize the observation time, setting, or patient condition during the observation, or nursing condition during the observation. These differences challenge the ability to validate the quality of the data. Further, the observational method is also at risk of a Hawthorne effect because nurses recognize being observed. The studies did not clearly describe how they dealt with these risks.

Not all studies were poorly performed. There are no universally accepted criteria for a "well-conducted" repositioning measurement tool, but self-administrative measurements are most suitable for controlling measurement errors. There are strategies for enhancing the validity, reproducibility, and overall quality of data collected from nurses by using their reports for their behaviors, such as repositioning. These strategies include case selection, variable definitions, abstraction

forms, framing a specific period, blinding, testing inter-rater agreement, and statistical investigations for reliability and validity.[62] Although no available study applied these techniques, this is a suitable solution theoretically.

Repositioning practice is a sensitive issue in the clinical context. Nurses have to comply with the required care. However, other factors might reduce the ability of nurses to do repositioning, such as staff shortages or work overload.[63] A structured measurement tool identifies the actual performance as a valid question. Given these challenges, developing an instrument that can deal with all of these challenges is required. The available tools show opportunities to improve the validity and reliability of the collected data.

Limitations

This review had several limitations. It mainly contained studies with low to moderate levels of evidence. Randomized controlled trials and blinding would be challenging to conduct in this area of research, and the lack of such study designs reflects this. Additionally, the studies were not supported by a robust validation procedure and reported data from single centers. The review was limited to only studies written in English. Differences in settings and policies in each institution make further comparisons and proper evaluations difficult. Finally, the study measurement error was guided by theory without a standardized tool.

Conclusion and Implications for Nursing Practice

This review assessed studies that measured repositioning based on an ability to measure repositioning quality, quantity, validity, reliability, and measurement errors. Plenty of tools were applied for repositioning measurement, and were classified based on their modes: chart review, observation, digital observation, and self-administrative questionnaires. Each has strengths and limitations. However, there is no available measurement tool to answer all concerns regarding the validity and reliability of measurements. Instead, the self-administrative modes had the potential ability to convince the quality of repositioning measurements. The analysis concludes with the need to develop a well-structured measurement tool for repositioning.

Repositioning measurement requires continuity and sustainability over time which are ongoing challenges for clinical nurses. We recommend further studies on repositioning measurements to ensure the reliability and validity of the repositioning measurement. Understanding the strengths and limitations of different techniques within this review provides the opportunity to combine the benefits of each method to select a site-specific plan for assessing repositioning practice. The expectations in advancing other tools and equipment that estimate the pressure distribution over the patient's skin might be an appropriate starting point for the measurement of repositioning.

References

1. EPUAP/NPIAP/PPPIA. European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, Pan Pacific Pressure Injury Alliance. Prevention and treatment of pressure ulcers/ injuries: clinical practice guideline. The International Guideline. EPUAP/NPIAP/PPPIA EHE, editors. European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance; 2019.
2. Moore Z, Van Etten M. Ten top tips: repositioning a patient to prevent pressure ulcers. Wounds International. 2014;5(3):6-9.
3. Moore Z, Cowman S, Conroy RM. A randomised controlled clinical trial of repositioning, using the 30 degrees tilt, for the prevention of pressure ulcers. J Clin Nurs. 2011;20(17-18):2633-44. doi:10.1111/j.1365-2702.2011.03736.x.

4. Gefen A. Reswick and Rogers pressure-time curve for pressure ulcer risk. Part 1. Nurs Stand (through 2013). 2009;23(45):64. doi:10.7748/ns2009.07.23.45.64.c7115.
5. Schutt SC, Tarver C, Pezzani M. Pilot study: assessing the effect of continual position monitoring technology on compliance with patient turning protocols. Nurs Open. 2018;5(1):21-8. doi:10.1002/nop2.105.
6. Soban LM, Hempel S, Munjas BA, Miles J, Rubenstein LV. Preventing pressure ulcers in hospitals: a systematic review of nurse-focused quality improvement interventions. Jt Comm J Qual Patient Saf. 2011;37(6):245-52. doi:10.1016/s1553-7250(11)37032-8.
7. Marsden G, Jones K, Neilson J, Avital L, Collier M, Stansby G. A cost-effectiveness analysis of two different repositioning strategies for the prevention of pressure ulcers. J Adv Nurs. 2015;71(12):2879-85. doi:10.1111/jan.12753.
8. Haesler E, Rayner R, Carville K. The pan pacific clinical practice guideline for the prevention and management of pressure injury. Wound Practice & Research. 2012; 20(1). https://www.awma.com.au/files/journal/2001_01.pdf
9. Miles S, Fulbrook P, Nowicki T, Franks C. Decreasing pressure injury prevalence in an Australian general hospital: a 10-year review. Wound Practice & Research. 2013;21(4):148-56. https://journals.cambridgemedia.com.au/application/files/3216/0505/7293/2104_01.pdf
10. Sung YH, Park KH. Factors affecting the healing of pressure ulcers in a Korean acute care hospital. J Wound Ostomy Continence Nurs. 2011;38(1):38-45. doi:10.1097/WON.0b013e318202a67e.
11. Miles SJ, Nowicki T, Fulbrook P. Repositioning to prevent pressure injuries: evidence for practice. Aust Nurs Midwifery J. 2013;21(6):32-5.
12. Bergquist-Beringer S, Dong L, He J, Dunton N. Pressure ulcers and prevention among acute care hospitals in the United States. Jt Comm J Qual Patient Saf. 2013;39(9): 404-14. doi: 10.1016/s1553-7250(13)39054-0.
13. Lyder CH, Ayello EA. Pressure ulcers: a patient safety issue. Patient safety and quality: an evidence-based handbook for nurses. 2008.
14. Iblasi AS, Aungsuroch Y, Gunawan J, Gede Juanamasta I, Carver C. Repositioning practice of bedridden patients: an evolutionary concept analysis. SAGE Open Nurs. 2022;8:23779608221106443. doi:10.1177/23779608221106443.
15. Gurtner GC. Frequent manual repositioning and incidence of pressure ulcers among bed-bound elderly hip fracture patients. Yearbook of Plastic and Aesthetic Surgery. 2012;2012(1):38-9. doi:10.1111/j.1524-475X.2010.00644.x.
16. Black JM, Edsberg LE, Baharestani MM, Langemo D, Goldberg M, McNichol L, et al. Pressure ulcers: avoidable or unavoidable? Results of the National Pressure Ulcer Advisory Panel Consensus Conference. Ostomy Wound Manage. 2011;57(2):24-37.
17. Voz A, Williams C, Wilson M. Who is turning the patients? A survey study. J Wound Ostomy Continence Nurs. 2011;38(4):413-8. doi: 10.1097/WON.0b013e318220b6ec.
18. Groves RM, Lyberg L. Total survey error: past, present, and future. Public Opin Q. 2010;74(5):849-79.
19. Salvucci S, Walter E, Conley V, Fink S, Saba M. Measurement error studies at the National Center for Education Statistics: U.S. Department of Education. National Center for Education Statistics; 1997.
20. Peters M, Godfrey C, McInerney P, Munn Z, Trico A, Khalil H. Chapter 11: Scoping Reviews. JBI Manual for Evidence Synthesis; 2020.
21. Juanamasta IG, Aungsuroch Y, Gunawan J, Fisher ML. Postgraduate and undergraduate student nurses' well-being: a scoping review. J Prof Nurs. 2022;40:57-65. doi:10.1016/j.profnurs.2022.03.001.
22. Tayyib N, Coyer F. Translating pressure ulcer prevention into intensive care nursing practice: overlaying a care bundle approach with a model for research implementation. J Nurs Care Qual. 2017;32(1):6-14. doi:10.1097/NCQ.0000000000000199.

23. Higgins JP, Altman DG, Gotzsche PC, Juni P, Moher D, Oxman AD, et al. The Cochrane Collaboration›s tool for assessing risk of bias in randomised trials. BMJ. 2011;343:d5928. doi: 10.1136/bmj.d5928.
24. Downs SH, Black N. The feasibility of creating a checklist for the assessment of the methodological quality both of randomised and non-randomised studies of health care interventions. J Epidemiol Community Health. 1998;52(6):377-84.
25. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP, et al. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. PLoS Med. 2007;4(10):e296. doi:10.1371/journal.pmed.0040296.
26. Trac MH, McArthur E, Jandoc R, Dixon SN, Nash DM, Hackam DG, et al. Macrolide antibiotics and the risk of ventricular arrhythmia in older adults. CMAJ. 2016; 188(7):E120-9. doi:10.1503/cmaj.150901.
27. Hooper P, Jutai JW, Strong G, Russell-Minda E. Age-related macular degeneration and low-vision rehabilitation: a systematic review. Can J Ophthalmol. 2008;43(2):180-7. doi:10.3129/i08-001.
28. Weiner C, Kalichman L, Ribak J, Alperovitch-Najenson D. Repositioning a passive patient in bed: choosing an ergonomically advantageous assistive device. Appl Ergon. 2017;60:22-9.
29. Webster J, Bucknall T, Wallis M, McInnes E, Roberts S, Chaboyer W. Does participating in a clinical trial affect subsequent nursing management? Post-trial care for participants recruited to the INTACT pressure ulcer prevention trial: a follow-up study. Int J Nurs Stud. 2017;71:34-8. doi:10.1016/j.ijnurstu.2017.02.022.
30. Chaboyer W, Bucknall T, Webster J, McInnes E, Gillespie BM, Banks M, et al. The effect of a patient centred care bundle intervention on pressure ulcer incidence (INTACT): a cluster randomised trial. Int J Nurs Stud. 2016;64:63-71. doi:10.1016/j.ijnurstu.2016.09.015.
31. Wogamon CL. Exploring the effect of educating certified nursing assistants on pressure ulcer knowledge and incidence in a nursing home setting. Ostomy Wound Manage. 2016; 62(9):42-50.
32. Hall KD, Clark RC. A prospective, descriptive, quality improvement study to investigate the Impact of a turn-and-position device on the incidence of hospital-acquired sacral pressure ulcers and nursing staff time needed for repositioning patients. Ostomy Wound Manage. 2016; 62(11):40-4.
33. Gunningberg L, Sedin IM, Andersson S, Pingel R. Pressure mapping to prevent pressure ulcers in a hospital setting: a pragmatic randomised controlled trial. Int J Nurs Stud. 2017;72:53-9. doi:10.1016/j.ijnurstu.2017.04.007.
34. Renganathan BS, Nagaiyan S, Preejith SP, Gopal S, Mitra S, Sivaprakasam M. Effectiveness of a continuous patient position monitoring system in improving hospital turn protocol compliance in an ICU: a multiphase multisite study in India. J Intensive Care Soc. 2019;20(4):309-15. doi:10.1177/1751143718804682.
35. Mehta C, George JV, Mehta Y, Wangmo N. Pressure ulcer and patient characteristics--A point prevalence study in a tertiary hospital of India based on the European Pressure Ulcer Advisory Panel minimum data set. J Tissue Viability. 2015;24(3):123-30. doi:10.1016/j.jtv.2015.04.001.
36. Sving E, Idvall E, Hogberg H, Gunningberg L. Factors contributing to evidence-based pressure ulcer prevention. A cross-sectional study. Int J Nurs Stud. 2014;51(5):717-25. doi:10.1016/j.ijnurstu.2013.09.007.
37. Courvoisier DS, Righi L, Bene N, Rae AC, Chopard P. Variation in pressure ulcer prevalence and prevention in nursing homes: a multicenter study. Appl Nurs Res. 2018;42:45-50. doi:10.1016/j.apnr.2018.06.001.
38. Kallman U, Bergstrand S, Ek AC, Engstrom M, Lindgren M. Nursing staff induced repositionings and immobile patients' spontaneous movements in nursing care. Int Wound J. 2016;13(6):1168-75. doi:10.1111/iwj.12435.
39. Tannen A, Dietz E, Dassen T, Halfens R. Explaining the national differences in pressure ulcer prevalence between the Netherlands and Germany--adjusted for personal risk factors and institutional quality indicators. J Eval Clin Pract. 2009;15(1):85-90. doi:10.1111/j.1365-2753.2008.00958.x.
40. Tayyib N, Lewis PA, Coyer FM. A prospective observational study of patient positioning in a Saudi intensive care unit. Middle East Journal of Nursing. 2013;7(1):26-34.

41. Moya-Suarez AB, Morales-Asencio JM, Aranda-Gallardo M, Enriquez de Luna-Rodriguez M, Canca-Sanchez JC. Development and psychometric validation of a questionnaire to evaluate nurses' adherence to recommendations for preventing pressure ulcers (QARPPU). J Tissue Viability. 2017;26(4):260-70. doi:10.1016/j.jtv.2017.09.003.
42. Meesterberends E, Halfens RJ, Spreeuwenberg MD, Ambergen TA, Lohrmann C, Neyens JC, et al. Do patients in Dutch nursing homes have more pressure ulcers than patients in German nursing homes? A prospective multicenter cohort study. J Am Med Dir Assoc. 2013;14(8):605-10. doi:10.1016/j.jamda.2013.03.005.
43. Kalisch BJ, Xie B, Dabney BW. Patient-reported missed nursing care correlated with adverse events. Am J Med Qual. 2014;29(5):415-22. doi:10.1177/1062860613501715.
44. Kalisch BJ, Tschannen D, Lee H, Friese CR. Hospital variation in missed nursing care. Am J Med Qual. 2011;26(4):291-9. doi:10.1177/1062860610395929.
45. Hanna DR, Paraszczuk AM, Duffy MM, DiFiore LA. Learning about turning: report of a mailed survey of nurses' work to reposition patients. Medsurg Nurs. 2016;25(4):219.
46. Sving E, Gunningberg L, Hogman M, Mamhidir AG. Registered nurses' attention to and perceptions of pressure ulcer prevention in hospital settings. J Clin Nurs. 2012;21(9-10):1293-303.doi:10.1111/j.1365-2702.2011.04000.x.
47. Peterson MJ, Gravenstein N, Schwab WK, van Oostrom JH, Caruso LJ. Patient repositioning and pressure ulcer risk--monitoring interface pressures of at-risk patients. J Rehabil Res Dev. 2013;50(4):477-88. doi:10.1682/jrrd.2012.03.0040.
48. De Meyer D, Van Hecke A, Verhaeghe S, Beeckman D. PROTECT - Trial: a cluster RCT to study the effectiveness of a repositioning aid and tailored repositioning to increase repositioning compliance. J Adv Nurs. 2019;75(5):1085-98. doi:10.1111/jan.13932.
49. Beeckman D, Defloor T, Schoonhoven L, Vanderwee K. Knowledge and attitudes of nurses on pressure ulcer prevention: a cross-sectional multicenter study in Belgian hospitals. Worldviews Evid Based Nurs. 2011;8(3):166-76. doi:10.1111/j.1741-6787.2011.00217.x.
50. Sterne JA, Hernan MA, Reeves BC, Savovic J, Berkman ND, Viswanathan M, et al. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. BMJ. 2016;355:i4919. doi: 10.1136/bmj.i4919.
51. Schutt SC, Tarver C, Pezzani M. Pilot study: assessing the effect of continual position monitoring technology on compliance with patient turning protocols. Nurs Open. 2018;5(1):21-8. doi:10.1002/nop2.105.
52. Hall KD, Clark RC. A prospective, descriptive, quality improvement study to investigate the impact of a turn-and-position device on the incidence of hospital-acquired sacral pressure ulcers and nursing staff time needed for repositioning patients. Ostomy Wound Manage. 2016;62(11):40-4.
53. Beeckman D, Defloor T, Schoonhoven L, Vanderwee K. Knowledge and attitudes of nurses on pressure ulcer prevention: a cross-sectional multicenter study in Belgian hospitals. Worldviews Evid Based Nurs. 2011;8(3):166-76. doi:10.1111/j.1741-6787.2011.00217.x.
54. Chaboyer W, Bucknall T, Webster J, McInnes E, Gillespie BM, Banks M, et al. The effect of a patient centred care bundle intervention on pressure ulcer incidence (INTACT): a cluster randomised trial. Int J Nurs Stud. 2016;64:63-71. doi:10.1016/j.ijnurstu.2016.09.015.
55. De Meyer D, Van Hecke A, Verhaeghe S, Beeckman D. PROTECT-Trial: a cluster RCT to study the effectiveness of a repositioning aid and tailored repositioning to increase repositioning compliance. J Adv Nurs. 2019;75(5):1085-98. doi:10.1111/jan.13932.
56. Gunningberg L, Martensson G, Mamhidir AG, Florin J, Muntlin Athlin A, Baath C. Pressure ulcer knowledge of registered nurses, assistant nurses and student nurses: a descriptive, comparative multicentre study in Sweden. Int Wound J. 2015;12(4):462-8. doi:10.1111/iwj.12138.

57. Mehta C, George JV, Mehta Y, Wangmo N. Pressure ulcer and patient characteristics–A point prevalence study in a tertiary hospital of India based on the European Pressure Ulcer Advisory Panel minimum data set. J Tissue Viability. 2015;24(3):123-30. doi:10.1016/j.jtv.2015.04.001.
58. Tannen A, Dassen T, Halfens R. Differences in prevalence of pressure ulcers between the Netherlands and Germany–associations between risk, prevention and occurrence of pressure ulcers in hospitals and nursing homes. Journal of clinical nursing. 2008 May;17(9):1237-44. doi: 10.1111/j.1365-2702.2007.02225.x.
59. Wogamon CL. Exploring the effect of educating certified nursing assistants on pressure ulcer knowledge and incidence in a nursing home setting. Ostomy Wound Manage. 2016; 62(9):42-50.
60. Hurd MD, Kapteyn A. Anchoring and acquiescence bias in measuring assets in household surveys. Elicitation of Preferences: Springer; 1999. p. 111-38.
61. Blair W, Smith B. Nursing documentation: frameworks and barriers. Contemp Nurse. 2012;41(2):160-8. doi:10.5172/conu.2012.41.2.160.
62. Polit DF, Beck CT. Essentials of nursing research: appraising evidence for nursing practice. Tenth ed: Lippincott Williams & Wilkins; 2017.
63. Iblasi A, Aungsuroch Y, Gunwan J. Factors affecting repositioning policy compliance: an integrative review. Front Nurs. 2021;8(1):7-22. doi:10.2478/fon-2021-0002.

การปรับเปลี่ยนท่าทางเพื่อป้องกันแผลกดทับ: การทบทวนการกำหนดขอบเขต

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บทคัดย่อ: การปรับเปลี่ยนท่าทางให้ผู้ที่ไม่สามารถเคลื่อนไหวร่างกายที่มีการกดทับบริเวณเนื้อเยื่อมากเกินควร จะช่วยให้การไหลเวียนของโลหิตดีขึ้น และป้องกันการบาดเจ็บจากการกดทับได้ แต่ยังมีความไม่ชัดเจนทางการปฏิบัติ หรือเครื่องมือประเมินการปฏิบัติการปรับเปลี่ยนท่าทางนั้น การทบทวนการกำหนดขอบเขตนี้ มีวัตถุประสงค์เพื่อค้นหาความชัดเจนในการประเมินการปรับเปลี่ยนท่าทาง โดยใช้ PRISMA-ScR เป็นแนวทางในการรายงานการศึกษา และใช้ The Joanna Briggs Institute Manual of Evidence Synthesis ในการสังเคราะห์สาระสำคัญของการกำหนดขอบเขตการประเมินการปรับเปลี่ยนท่าทาง จากบทความที่เผยแพร่ระหว่างปี ค.ศ. 2009 ถึง 2021 ที่ค้นพบจากฐานข้อมูล Cochrane Wounds Group Specialized Register, Ovid MEDLINE, EBSCO CINAHL, Clinical Key database, and Ovid MEDLINE (ที่อยู่ระหว่างการดำเนินการเพื่อเผยแพร่ และไม่มีดัชนีการอ้างอิง, 2009-2021) ในส่วนเพิ่มเติมจากการอ้างอิงของการศึกษาที่เกี่ยวข้องนั้น

การศึกษานี้ใช้การทบทวนวรรณกรรมที่เผยแพร่เป็นภาษาอังกฤษ จากผลงานวิจัยทั้งแบบทดลองและไม่ใช่การทดลอง รายงานของแผนกและสถานพยาบาลที่มีเนื้อหาฉบับเต็ม แต่ไม่รวมการทบทวนวรรณกรรมทางเศรษฐกิจ การศึกษาเชิงคุณภาพ การทบทวนวรรณกรรมอย่างเป็นระบบ และการศึกษาที่มิได้มุ่งเน้นถึงขั้นตอนการปฏิบัติงานของพยาบาล โดยนำรายการตรวจสอบ STROBE และกระบวนการประเมินคุณภาพของ Downs and Black มาใช้ในการตรวจสอบคุณภาพของบทความ จากการวิเคราะห์พบมีการศึกษาวิจัย 24 รายการ ที่มีการออกแบบงานวิจัยแบบสุ่มเข้ากลุ่ม 4 รายการ ไม่สุ่มเข้ากลุ่ม 5 รายการ และแบบตัดขวาง 15 รายการ และรูปแบบที่พบมากที่สุดในการประเมินการปฏิบัติการปรับเปลี่ยนท่าทาง คือการบันทึกในแฟ้มประวัติ 11 รายการ รองลงมาคือการสังเกตแบบดิจิทัล 5 รายการ จากการสังเกต 4 รายการ และจากการใช้แบบสอบถามที่ให้ตอบด้วยตนเอง 4 รายการ

ผลจากการศึกษานี้พบความคลาดเคลื่อนจากการวัด ไม่พบเครื่องมือประเมินที่สามารถใช้ได้ด้วยความแม่นยำและมีความน่าเชื่อถือของการวัด จึงเสนอว่าเป็นความต้องการเครื่องมือประเมินการปรับเปลี่ยนท่าทางใหม่ที่มีมาตรฐาน

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คำสำคัญ: การบาดเจ็บจากการกดทับ ความคลาดเคลื่อนจากการวัด การปรับเปลี่ยนท่าทาง การทบทวนการกำหนดขอบเขต

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