INPLASY PROTOCOL

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None declared.

Would you choose a prediction model? A protocol for systematic review of Risk prediction models for pressure injury in surgical patients

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Review question / Objective: **To conduct a systematic review of all currently available pressure injury risk prediction models for surgical patients, and provide a reference for the construction, application and optimization of related prediction models.**

Information sources: **A systematic review of the intraoperatively acquired pressure injury prediction model was conducted. We searched the following electronic databases without language limitations: PubMed, EMBASE.com, Cochrane Library, Web of Science, CINAHL Complete, China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBM), weipu data and Wanfangdata.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 December 2021 and was last updated on 07 December 2021 (registration number INPLASY2021120037).

INTRODUCTION

Review question / Objective: **To conduct a systematic review of all currently available pressure injury risk prediction models for surgical patients, and provide a reference for the construction, application and optimization of related prediction models.**

Rationale: **Pressure injury (PI) is a common patient safety problem faced by medical and health institutions around the world. Surgical patients are the high-risk group of patients with pressure injury in hospital. Intraoperative acquired pressure injury in patients undergoing surgery will not only have negative effects on postoperative**

recovery, but also increase incidence rate, hospital stay and medical care cost. Prevention of pressure injury is recognized as the most cost-effective and effective method in the world. In recent years, the number of pressure injury risk prediction models for surgical patients is increasing. As far as we know, there has not been a comprehensive and rigorous quality evaluation of the risk prediction model of pressure injury in surgical patients.

Condition being studied: Globally, intraoperatively acquired stress injury (IAPI) is a major health challenge. As an emerging method of pressure injury risk prediction, the risk prediction model, its prediction effect and ability has also attracted the attention of researchers. In recent years, the number of risk prediction models for IAPI has been increasing. Many researchers have developed corresponding risk prediction models for different types of surgery, such as cardiovascular surgery, orthopedic surgery, craniotomy, etc., but the quality and results of the literature are not consistent. As we all know, clinical nurses usually rely on the early warning of stress injury risk prediction scores to take targeted preventive measures for high-risk patients. Therefore, it is very important to ensure the accuracy of the risk prediction score, and the differences in the method of establishing the risk prediction model and the verification process will affect the quality and further application of the prediction model. It is understood that the IAPI risk prediction model has not been strictly and comprehensively evaluated. This study will use the predictive model evaluation tool PROBAST to systematically evaluate the developed PI risk prediction model for surgical patients, and provide a reference for the related research and clinical application of the predictive model.

METHODS

Search strategy: #1 "Pressure Ulcer"[Mesh] | #2 "pressure ulcer"[Title/Abstract] OR "pressure ulcers"[Title/Abstract] OR bedsore[Title/Abstract] OR bedsores[Title/Abstract] OR "pressure sore"[Title/Abstract] OR "pressure sores"[Title/Abstract] OR "pressure injury"[Title/Abstract] OR "pressure injuries"[Title/Abstract] OR "bed sore"[Title/Abstract] OR "bed sores"[Title/Abstract] OR "decubitus ulcer"[Title/Abstract] OR "decubitus ulcers"[Title/Abstract] OR "decubital ulcer"[Title/Abstract] OR "decubital ulcers"[Title/Abstract] OR "decubital ulcus"[Title/Abstract] OR "decubitus ulceration"[Title/Abstract] OR "decubitus ulcus"[Title/Abstract] OR "ulcus decubitus"[Title/Abstract] OR "decubus ulcer"[Title/Abstract] | #3 #1 OR #2 | #4 Predict*[Title/Abstract] OR prognose*[Title/Abstract] OR prognostic*[Title/Abstract] OR warning*[Title/Abstract] OR model*[Title/Abstract] OR "risk model"[Title/Abstract] OR "risk instrument"[Title/Abstract] OR "risk score"[Title/Abstract] OR "risk index"[Title/Abstract] OR "risk assessment model"[Title/Abstract] OR "risk assessment instrument"[Title/Abstract] OR "risk assessment tool"[Title/Abstract] OR "risk assessment score"[Title/Abstract] | #5 #3 AND#4.

Participant or population: Surgical patients who had no pressure injury prior to surgery.

Intervention: Not applicable.

Comparator: Not applicable.

Study designs to be included: Cohort, case-control, or cross-sectional studies.

Eligibility criteria: The subjects were surgical patients without pressure injury before surgery; The research content is the construction or validation of PI risk prediction model; The literature contains one or more of the relevant outcome indicators, such as sensitivity, specificity, subject operating curve, area under curve, positive likelihood ratio and negative likelihood ratio of risk prediction model.

Information sources: A systematic review of the intraoperatively acquired pressure injury prediction model was conducted. We searched the following electronic databases without language limitations: PubMed, EMBASE.com, Cochrane Library,

Web of Science, CINAHL Complete, China National Knowledge Infrastructure (CNKI), Chinese Biomedical Literature Database (CBM), weipu data and Wanfangdata.

Main outcome(s): We will assess the methodological quality of the determined risk prediction model using the PROBAST, and performed a combined analysis of the effect size of the predictor with a higherfrequency.

Additional outcome(s): None.

Data management: Records will be managed by EndNote X 9.0 (Developed by the American Institute for Scientific Information, http://www.endnote.com) software to exclude duplicates.

Quality assessment / Risk of bias analysis: Two researchers independently use PROBAST to evaluate the bias risk of the risk prediction model from four fields including 20 signal problems, such as the included research population, predictors, results and data analysis, and to evaluate the clinical applicability of the research object, predictors and results. In case of disagreement or uncertainty, discuss and solve with the third researcher.

Strategy of data synthesis: This study will use descriptive analysis method to sort out and summarize the included literature, including the basic characteristics of the model, modeling method, modeling sample size, model testing method, model testing sample size and predictors. The calibration and discrimination of the model are reflected by extracting indexes such as sensitivity, specificity and area under the working characteristic curve of subjects. Stata16.0 software will be used to combine the predictive value of the predictors with high frequency in the model, and heterogeneity was evaluated by I2. If I2 < 25%, no heterogeneity was determined; If I2 is between 25% - 50%, it is determined that the heterogeneity is small; If I2 is between 50% - 75%, it is determined that there is a certain heterogeneity; If I2 > 75%, it is determined that there is great heterogeneity. When I2 < 50%, the fixed effect model is used to analyze the data. When I2 > 50%, the random effect model is used to analyze the data, and the sensitivity analysis is used to detect the strength of the data results. The measurement data are expressed by weighted mean difference (WMD) and 95% confidence interval (CI), and the count data are expressed by odds ratio (OR) and 95% CI. The difference was statistically significant when $p < 0.05$.

Subgroup analysis: Subgroup analysis will be conducted according to the result of evaluation

Sensitivity analysis: By changing some important factors that may affect the synthesis results, such as statistical methods (fixed or random) or adopting different inclusion criteria (such as research quality), observe the heterogeneity of different studies and whether the combined results have changed, so as to determine the stability and strength of the results.

Language: The language is limited to English andChinese.

Country(ies) involved: China.

Keywords: Pressure injury; Risk prediction; Model; Surgical patient; Systematic review; Nursing care.

Contributions of each author:

Author 1 - Jiaoyan Zhang - The Author (1) conceived this study (2) designed the inclusion/exclusion criteria and the searching strategy (3) will be searched for the literature(4) will be collected the data and made statistical analysis(5) drafted the protocol and revised the manuscript.
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