
Preventing pressure ulcers in hospitals: a systematic review of nurse-focused quality improvement interventions

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CRD summary

The review found that quality improvement interventions for pressure ulcer prevention may reduce overall incidence of hospital-acquired pressure ulcers. As the authors noted, these findings should be regarded cautiously due to the low quality of the evidence and differences between the studies.

Authors' objectives

To evaluate nurse-focused quality improvement interventions for preventing pressure ulcers in hospitals.

Searching

PubMed, CINAHL, The Cochrane Library, DARE, Web of Science and the websites of the Robert Wood Johnson Foundation and the US Agency for Healthcare Research and Quality were searched from 1990 to September 2009. Search terms were reported. Reference lists of included studies and relevant reviews were checked. The search was restricted to studies in English.

Study selection

Experimental randomised controlled trials (RCTs), non-randomised controlled trials (CTs), cohort studies, time series and controlled or uncontrolled pre-post studies of quality improvement interventions for changing routine methods of pressure ulcer prevention in a hospital setting were eligible for inclusion. Quality improvement interventions were defined in the review as interventions that addressed structure and/or process changes as defined in the Donabedian framework. Studies were required to report at least one nursing process- or patient-related outcome. Studies of solely educational interventions, wound-care or site-specific pressure ulcers were excluded.

Most studies were set in single hospitals with multiple units. Participants included adults and children with a wide variety of clinical conditions. Most studies used multiple intervention strategies, including pressure-ulcer-specific measures combined with quality improvement strategies. The most commonly used strategies were protocol-based care, staff education, pressure-ulcer risk assessment tools, performance monitoring and assembling a new team to plan the intervention. Methods of delivery ranged from simple one-off events to complex ongoing activities. Only half of the studies that used performance monitoring also provided feedback to staff. Most studies reported patient-related outcomes and few reported nursing process measures. Measures of pressure ulcer incidence were inconsistent across studies (with respect to pressure ulcer stage, units of measurement). Process of care measures differed widely. The final assessment was conducted between six and 60 months after completion of the intervention (where reported). Most studies took place in USA.

Two reviewers independently selected the studies. Disagreements were resolved by discussion.

Assessment of study quality

A score was allocated from 0 (clearly absent) to 2 (clearly present) for the quality of reporting of intervention, inclusion criteria, analysis and results, use of objective measure for skin integrity, consistency of treatment across groups, length of follow-up and whether both patient- and process-related outcomes were reported. These criteria were based partly on published methods. The maximum score was 16.

The authors did not state how many reviewers performed quality assessment.

Data extraction

Data on pressure ulcer rates (incidence or hospital-induced prevalence) were extracted for each study. For studies with multiple data points, the data points immediately preceding the intervention and the last reported were used.

Data were extracted independently by two reviewers. Discrepancies were resolved by discussion.

Methods of synthesis

Data from studies that reported pressure ulcer incidence and sample size were pooled using a random-effects model to calculate the pooled risk difference (RD). Heterogeneity was assessed using the I^2 test.

Results of the review

Thirty-nine studies were included (three CTs, one time series and 35 uncontrolled pre-post studies). Sample sizes ranged from 10 beds to 17 hospitals. The overall level of evidence was low. Mean quality score was 10.5 out of 16 (range 4 to 15). The items that scored lowest were reporting of inclusion criteria and types of measures reported.

Most studies (36 out of 39) found that the intervention had a positive effect on at least one nursing process or patient health outcome. There was a statistically significant 7% lower rate of pressure ulcers in the intervention groups following the intervention (RD -0.07, 95% CI -0.0976 to -0.0418; one CT, 15 pre-post studies) with considerable heterogeneity across studies ($I^2=70\%$).

Authors' conclusions

Quality improvement interventions aimed at pressure ulcer prevention may reduce the overall incidence of hospital-acquired pressure ulcers.

CRD commentary

The objectives and inclusion criteria of the review were clear, Relevant sources were searched for studies. The restriction to studies in English meant that relevant non-English studies may have been excluded. It was unclear whether unpublished studies were eligible and potential for publication bias was not discussed. Steps were taken to minimise risks of reviewer bias and error by having more than one reviewer independently select studies and extract data; it was not entirely clear whether this also applied to the validity assessment.

Limited details of included studies were reported in the paper; fuller details were available in an online appendix for subscribers only. It was questionable whether it was appropriate to pool data on pressure ulcer incidence in view of the differences in outcome measures and marked statistical heterogeneity in the analysis. Where findings were reported descriptively statistical significance was reported but in most cases there was no indication of effect size or variability of data. These factors made the clinical significance of the review findings difficult to interpret. Study quality was taken into consideration in the interpretation of results.

As the authors noted, their findings should be regarded cautiously due to the low quality of the evidence and differences between the included studies.

Implications of the review for practice and research

Practice: The authors did not state any implications for practice.

Research: The authors stated that future studies should investigate links between performance monitoring and feedback. More evidence was needed on the mechanisms whereby interventions improve outcomes and on contextual features associated with success or failure of specific interventions. Both process outcomes and patient-related outcomes should be reported.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.