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Title: Advancing Pressure Ulcer Prevention: Evaluating the Impact of Patient and Lay Carer Education

Commentary on: O'Connor T, Moore ZE, Patton D. Patient and lay carer education for preventing pressure ulceration in at-risk populations. *Cochrane Database Syst Rev.* 2021 Feb 24;2(2):CD012006. doi: 10.1002/14651858.CD012006.pub2. PMID: 33625741; PMCID: PMC8095034.

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Conflicts of interest statement

The authors declare no conflicts of interest.

Abstract

Decubitus ulcers, also known as bedsores or pressure ulcers, result from prolonged pressure on the skin, with contributing factors such as shear forces, friction, and excessive moisture. Pressure ulcers have significant physical, social, and psychological consequences for patients and impose a substantial financial burden on healthcare providers. Patient and caregiver education has been suggested as a potential approach for preventing pressure sores. In order to investigate the potential preventive impact, O'Connor et al. conducted a Cochrane systematic review. Their study aimed to assess the effectiveness of educational interventions for patients and caregivers in preventing pressure ulcers. This commentary aims to critically appraise the methods used within the Cochrane systematic review by O'Connor et al 2022 and expand upon the findings in the context of clinical practice.

Key Points

- The available evidence regarding the effectiveness of educational interventions for preventing pressure sores is limited.
- Due to the current lack of evidence, it is not possible to make any specific recommendations for educational interventions aimed at preventing pressure sores in Community Nursing practice.
- Research studies that adhere to standardized and rigorous methodologies are required to assess the effectiveness of educational interventions in preventing pressure sores.

Introduction

Decubitus ulcers, commonly known as bedsores or pressure ulcers (PUs), are injuries to the skin and underlying tissues caused by continuous or extended pressure applied to the skin (1). Other contributing factors include shear forces, friction, and excessive moisture (2). Pressure ulcers are commonly found over areas of bony prominence in patients who have long periods of inactivity, secondary to their chronic condition that limits their mobility or affects their sensations (3). The development of PUs has a significant physical, social and psychological impact on the patient as well as a financial burden on healthcare providers (4). Pressure ulcers are a common and preventable condition that affect over 700,000 patients in the United Kingdom every year (5). It costs the National Health Service (NHS) more than £3.8 million every day to treat PUs (5).

It has been suggested that many PUs is preventable (3, 6). In recent times pressure sore prevention has been set as a primary goal of pressure sore research (7). It has been proposed that one way that PUs can be prevented is via patient and carer education (8). To explore this possible preventative effect O'Connor and colleagues conducted a Cochrane systematic review to examine the effect of educational interventions for patients and caregivers in preventing PUs among individuals at risk (9).

Aim of commentary

This commentary aims to critically appraise the methods used within the Cochrane systematic review by O'Connor et al (2022) and expand upon the findings in the context of clinical practice.

Methods of O'Connor et al (2022)

A comprehensive and robust multi-database search was undertaken from date of inception until June 2019. All included studies' citations were screened for additional studies. Additional screening of related systematic reviews and health technology reports was undertaken. Only random controlled trials which included patients or carers of patients who are at risk of pressure ulceration and received an educational intervention for preventing pressure ulceration compared to usual care/no intervention were included. Screening, assessment of bias (Cochrane Risk of Bias Assessment Tool) and data extraction was carried out by two independent reviewers. Due to the heterogeneity of the included studies and limited numbers of studies, a narrative synthesis was undertaken clustered around location/type of wound, and outcomes by time period.

Results of O'Connor et al (2022)

Out of the 666 citations screened, 10 studies were identified to be included in the review. Out of these 10 studies seven studies delivered interventions to individuals at risk of ulceration, two studies took a broader approach and targeted family carers and those at risk, and one study provided the intervention to carers only. All ten studies measured patient outcomes of those at risk of ulceration.

There was very low-quality evidence that individualised pressure ulcer (PU) education and monthly telephone follow-ups may reduce the risk of people developing a new ulcer compared to standard pressure sore education and quarterly mail or telephone follow-up (Relative Risk [RR] 0.33, 95% confidence interval [95% CI] 0.17 to 0.67) (see Table 1 for All GRADE comparisons and outcomes). When comparing the schedule of telephone follow-up, there was very low-quality evidence that a monthly follow-up may be more effective than quarterly mail or telephone follow-up for the risk of people developing a new ulcer (RR 0.61, 95% CI 0.34 to 1.08). There was also very low evidence that home-based training may reduce the risk of people developing a new ulcer compared to usual care (RR 0.53, 95% CI 0.27 to 1.02).

To improve patient knowledge of PU prevention, an enhanced educational intervention with a structured follow-up (Mean difference [MD] 9.86, 95% CI 1.55 to 18.17, very low quality) and a structured, patient-centric PU prevention education (MD 30.15, 95% CI 23.56 to 36.74, very low quality) approach may be effective.

Table 1: All GRADE comparisons and outcomes

The population who received the training	Clinical setting	Intervention	Control	Outcome	Effect (95% confidence interval)	GRADE (Quality)
General patients and carers	Orthopaedic setting	Self-instruction and one-to-one counselling	Self-instruction	Proportion of participants developing a new ulcer (3 months)	RR 0.40 (0.14 to 1.18)	Very low
Carers caring for patients at risk of pressure ulcers	Community (patient's home)	Carer self-instruction and one-to-one counselling	Self-instruction alone	Proportion of participants developing a new ulcer (12 months)	RR 2.05 (0.19 to 21.70)	Very low
Patients at risk of pressure ulcers and their family caregivers	Community (patient's home)	Home-based training	Usual care	Proportion of participants developing a new ulcer (3 months)	RR 0.53 (0.27 to 1.02)	Very low
Individuals with neurological disorders	Patient's home	Education	Standard printed material	Proportion of participants developing a new	RR 3.57 (0.78 to 16.38)	Very low

				pressure (12 months)		
Individuals with spinal cord injury	Veterans medical centre	Individualised pressure ulcer education and monthly structured telephone follow-up	Standard pressure ulcer education and monthly mail or telephone follow-up	Proportion of participants developing a new ulcer (24 months)	RR 0.55 (0.23 to 1.30)	Very low
Individuals with spinal cord injury	Veterans medical centre	Standard pressure ulcer education and monthly mail or telephone follow-up	Standard pressure ulcer education and quarterly mail or telephone follow-up	Proportion of participants developing a new ulcer (24 months)	RR 0.61 (0.34 to 1.08)	Very low
Individuals with spinal cord injury	Veterans medical centre	Individualised pressure ulcer education and monthly structured telephone follow-up	Standard pressure ulcer education and quarterly mail or telephone follow-up	Proportion of participants developing a new ulcer (24 months)	RR 0.33 (95% CI 0.17 to 0.67)	Very low
Hospitalised patients	Tertiary hospital	Pressure ulcer prevention care bundle	Standard care	Proportion of participants developing a new ulcer (28 days)	HR 0.58 (0.25 to 1.33)	Low
Individuals with spinal cord injury	Hospital	Enhanced educational intervention and structured follow-up	Standard education alone	Pressure ulcer prevention knowledge test developed by the study author	MD 9.86, 95% CI 1.55 to 18.17	Very low

Commentary

Using the Measurement Tool to Assess Systematic Review (Amstar2) this Cochrane systematic review achieved 11 out of 16 criteria (10) (see Table 2 for full critical appraisal). However, the four criteria which were not achieved were deemed to be not applicable due to the review being unable to carry out a meta-analysis. Therefore, this review provides a comprehensive summary of evidence that addresses the question of interest.

Table 2: Critical appraisal using the AMSTAR-2 tool for assessing systematic reviews.

AMSTAR 2 items	Responses
1. Did the research questions and inclusion criteria for the review include the components of PICO?	Yes
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	Yes
3. Did the review authors explain their selection of the study designs for inclusion in the review?	Yes
4. Did the review authors use a comprehensive literature search strategy?	Yes
5. Did the review authors perform the study selection in duplicate?	Yes
6. Did the review authors perform data extraction in duplicate?	Yes
7. Did the review authors provide a list of excluded studies and justify the exclusions?	Yes
8. Did the review authors describe the included studies in adequate details?	Yes
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in the individual studies that were included in the review?	Yes
10. Did the review authors report on the sources of funding for the studies included in the review?	Yes
11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?	No
12. If meta-analysis was performed did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	No

13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?	Yes
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	No
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	No
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	Yes

Based on this review there is currently limited and inconsistent evidence regarding the effects of educational interventions to prevent PUs in any clinical setting. Regarding the community setting only two of the studies were carried out in the community, of which only one study indicated borderline statistically significant difference in risk of PUs at three months. It is important to note that this finding is based upon very low certainty evidence. Which means that the true effect is probably markedly different from the estimated effects indicated within the review (11). There was also very low certainty evidence that individual educational interventions may provide a reduce risk of a new pressure sore at 24 months compared to standard education. Furthermore, an enhanced 4 hour educational intervention may provide increased knowledge around PUs compared to standard education alone. Similarly, there is limited certainty in these findings due to the sparsity of the evidence and the limited certainty in the estimates presented.

The National Institute for Health and Care Excellence (NICE) guidelines on the prevention and management pressure ulcers does not specifically describe a preventative educational intervention for patients (12). However, it does suggest that patients should be provided with information that is timely and tailored to the individual's needs and provided to specific patients and family members who are deemed to be at high risk. When delivering this information patient's cognitive impairment, impaired mobility, neurological impairment and degenerative conditions should be considered (12, 13). It is important to consider the limitations of the patient's working memory and difficulty of the information/task which the patient is required to learn/undertake (13). Whenever feasible, the information and educational material presented to patients should be easily comprehensible by individuals of varying literacy and educational backgrounds (14). Furthermore, technical jargon should be avoided, and information should be split up into manageable chunks (14). Patient family education could serve as an alternative channel for delivering information in cases where implementing these amendments proves challenging (15). Regarding course contents the NICE guidelines for pressure ulcers prevention and management go on to recommend that information which patients would need to know would be about causes, symptoms, and methods to prevent PUs (12). For the method of delivery, it is typically perceived that active learning may provide a more enhanced mode of learning than non-interactive learning (16, 17). Utilising delivery methods such as computer technology, audio and videotapes, written materials, and demonstrations may provide an enhancement of delivery (18). If undertaking any educational intervention there should be a structured and robust method of assessment of the learning outcomes being delivered (19). This assessment can be undertaken using tools such as the Patient Education Implementation Scale (20), the Health Education Impact Questionnaire (21), Psychometric Evaluation of the Expected Knowledge and Received Knowledge of Hospital Patients tools (22).

As highlighted within the Cochrane review, there is a substantial lack of research in this area and further research is required in both community and hospital settings. Moreover, the existing body of evidence displayed a significant methodological weakness, underscoring the necessity for more rigorous research methodologies to be employed in future studies. Due to the complexity of educational interventions future research should try to ensure a standard reporting mechanism of the educational intervention is developed and utilised within future research. This will facilitate in greater transparency of the educational intervention and help with assessment of important moderating factors within future evidence synthesis. Furthermore, where assessment is undertaken, methodologically valid and reliable tools should be utilised.

CPD reflective questions:

- *What educational interventions are you aware of which are used in your area of practice?*
- *What factors should you take into consideration when designing an educational intervention for pressure sore prevention?*
- *What tools do you currently use to assess your educational interventions?*

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