

Quantitative analysis of pressure ulcers



Quantitative Analysis

Background and Significance

Pressure ulcers are due to bony prominences meeting or touching hard surfaces (Bergstrom et al., 2014). The occurrence of bedsores can increase the occurrence of death, hospitalization, and decrease the quality of life for many patients (Bergstrom et al., 2014, p. 5). Current guidelines state pressure ulcers can be decreased by turning every two hours and using pressure distributing mattresses. “ Preventing Pressure Ulcers: A Multisite Randomized Control Trial in Nursing Home Patients” evaluates the optimum turning frequency of patients in a long-term care facility (LTC) aged 65 or older using a high-density foam mattress in the United States and Canada (Bergstrom et al., 2014, p. 11).

Research Question and Hypothesis

A clear hypothesis is not stated, however, a possible hypothesis according to the study is there will be no difference in the reduction of pressure ulcers with increased turning times using a high-density foam mattress. The study aims to answer the question as to whether increased turning times at two, three or four-hour intervals using a high-density foam mattress prevent pressure ulcers more effectively than using the current standard of turning every two hours and including using a high-density foam mattress (Bergstrom et al., 2014, p . 4). The study focuses on the best practice intervention of turning patients every two hours and details other studies or observations that patients are not turned every two hours uniformly. The study also examines the possibility of cost reduction for LTC facilities and

increasing the quality of life in patients at risk for pressure ulcers. The purpose and goal are clearly defined. The study can be applied to the nursing practice and strengthens the guidelines on prevention of pressure ulcers and possibly how to increase the quality of life on patients at risk in LTC facilities.

Review of the Literature

The article references several scholarly articles and flows logically in an organized format. The article states the strength and weaknesses of the study and arrives at a logical hypothesis. Bergstrom et al. (2014) state the results of the study follow with previous studies performed. However, the study presents with other observations such as the possible improvement of the quality of life for patients at risk for pressure ulcers on high-density foam mattresses and reducing treatments costs (Bergstrom et al., 2014).

Methods

Internal and External Validity

The study uses a multi-center approach of two LTC facilities lasting for three weeks (Bergstrom et al., 2014, p. 11). Training occurs for two to three days for all staff involved in patient care (Bergstrom et al., 2014, p. 12). Allocation of participants occurs to one of three groups using numbered envelopes and all assessors are blind to the treatment groups (Bergstrom et al., 2014, p. 11). Discussion of the LTC criteria is in detail however, selection bias may have occurred. Both facilities follow the same turning times within 30 minutes and a supervisor observes and documents positions to control for

treatment fidelity (Bergstrom et al., 2014, p. 12). The study also controls for treatment fidelity by evaluating the documentation of the percent on-time turning of patient positions monthly with the staff, length of time in one position, and percent agreement between supervisor and staff for hourly positioning (Bergstrom et al., 2014, p. 12). The participants are white females and generalizability to other races or ethnic groups may not be possible.

Sampling

Randomization of participants ($n = 924$) into three groups occurs using numbered envelopes with 321 patients allocated to turning every two hours, 326 patients every three hours, and 295 every four hours (Bergstrom et al., 2014, p. 14). The LTC facilities are in the United States ($n = 20$) and Canada ($n = 7$) (Bergstrom et al., 2014, p. 11). Twenty-five participants are lost due to death or hospitalization (Bergstrom et al., 2014, p. 14). Inclusion requirements include being free from pressure ulcers and scoring a Braden Scale of 10 to 14 (Bergstrom et al., 2014, p. 11). Distribution occurs using risk stratification from high to low. Exclusion criteria include a short length of stay, at no risk for skin breakdown, and a Braden Scale score indicating low, no risk, or very high risk. The study may generalize to a majority of LTC female patients using high-density foam mattresses and may prove some significance in many patients with decreased mobility.

Legal and Ethical Issues

According to Bergstrom et al. (2014), the ethics committees from Texas University and Toronto approved the study. The United States LTC facilities

completed Federal Wide Assurance (FWA) and agree to comply with federal regulations for human rights (Bergstrom et al., 2014). Residents in the LTC facility are screened for competency and asked for consent. A recruiter establishes competency by asking three questions related to the formality of the study (Bergstrom et al., 2014, p. 12). Consent occurs through legal representation.

Data Collection Methods and Procedures

Instruments of measure are observations and the Braden Scale. The instruments are appropriate for the study and references are given to show validity and reliability. A licensed nurse supervisor and nursing care staff record observations of positioning to increase intervention fidelity. Training of staff at each facility occurs for two to three days and a mock trial is conducted to ensure appropriate training (Bergstrom et al., 2014, p. 12). Blind assessment of pressure ulcers is done weekly as a strength to the study. All LTC facilities follow the same procedure for assessing pressure ulcers and have 30 minutes from the scheduled repositioning time to record and reposition patients. All staff is to report findings to a supervisor (Bergstrom et al., 2014, p. 12). The University of Toronto stores and verifies all data and Texas receives faxes of the documentation. (Bergstrom et al., 2014).

Reliability and Validity

Risk assessment for pressure ulcers uses the Braden Scale and is appropriate for the study. Equal training at the LTC facilities ensures the reliability and validity of the study and inter-rater reliability are performed

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during training and quarterly. However, a limitation may be an inadequate understanding of the training by some staff even with a mock trial. Another limitation of the study includes participants with nutritional deficiencies, excessive incontinence, and low body mass index. Also, generalization may not occur to other races, ages, or ethnicities as the participants are white females with a mean age of 85. 1 (Bergstrom et al., 2014, p. 14).

Data Analysis

The article uses descriptive statistics along with logistic regression analysis to predict the probability of a pressure ulcer forming (Bergstrom et al., 2014). Bivariate analysis, *t*-tests or analysis of variances, Wilcoxon tests, and Fisher's exact tests are appropriate to evaluate the study variables. The computer program SAS version 9. 9 calculates all analysis and a score of $p < 0. 05$ is the significance level (Bergstrom et al., 2014, p. 13). Several tables supplement the text and reflect all the data. All tables contain precise titles and headings and do not repeat the text. All data present in the text and in table form clearly support the research question and hypothesis.

Conclusions, Implications, and Recommendations

The results of the study present objectively and are in a logical and concise order. The results are consistent with other studies presented as well as with a female population aged 85 to 87 years old (Bergstrom et al., 2014, p. 27). Bergstrom et al. (2014) state the strengths of the study lie with using the Braden Scale and implementing the evidence-based practices. The assessing of skin for risk for injury is also a highly important aspect of the

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study. The authors state a limitation is the findings may only apply to patients at moderate to high risk for pressure ulcers using a high-density foam mattress. Other studies need to include different gender, race, age, and socioeconomic status. Bergstrom et al. (2014) do not state any recommendations for future studies and state many studies only evaluate a prognostic tool or create a new tool. Implications to the nursing field are discussed.

Applicability to Nursing Practice

No risks in the study present using a two, three, or four-hour repositioning schedule provided the use of a high-density foam mattress (Bergstrom et al., 2014, p. 29). The study supports using a three to four-hour repositioning schedule only for high-performing LTC facility and when using a high-density foam mattress (Bergstrom et al., 2014, p. 29). The benefits are to improve the quality of life for patients by increasing sleep in patients and to provide evidence of the importance of repositioning and skin assessments. The study also supports the use of the Braden Scale intervention in nursing practice. Other benefits include improving the time for nursing staff to provide patients with more social interaction, ensuring nutrition, toileting, and more mobilization (Bergstrom et al., 2014). The costs of the study are providing all patients at moderate to high risk with high-density foam mattresses and time spent educating nursing assistants to recognize skin issues and properly preventing them. Generalization can occur to other patients of the same gender using the Braden Scale to assess for risk for pressure ulcers and using a high-density foam mattress. Replication of the study can occur, however, due to the study using only high-performing LTC facilities and high-

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density foam mattress, the potential harm using low or moderate performing facilities may outweigh the benefits.

References

- Bergstrom, N., Horn, S., Rapp, M., Stern, A., Barrett, R., Watkiss, M., & Krahn, M. (2014). Preventing pressure ulcers: A multisite randomized control trial in nursing homes. *Ontario health technology assessment series, 14* (11), 1-32. Retrieved from <https://www.hqontario.ca/evidence/publications-and-ohtac-recommendations/ontario-health-technology-assessment-series/turn-multisite-trial>