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Original Article

Educational intervention on physical restraint use in long-term care facilities – Systematic review and meta-analysis



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Received 16 December 2016; accepted 8 May 2017

Available online 19 July 2017

KEYWORDS

Elder;
Education;
Long term care;
Meta-analysis;
Physical restraint

Abstract “Physical restraint” formerly used as a measure of protection for psychiatric patients is now widely used. However, existing studies showed that physical restraint not only has inadequate effect of protection but also has negative effects on residents. To analyze the impact of educational program on the physical restraint use in long-term care facilities. Design: A systematic review with meta-analysis and meta-regression. Eight databases, including Cochrane Library, ProQuest, PubMed, EMBASE, EBSCO, Web of Science, Ovid Medline and Physiotherapy Evidence Database (PEDro), were searched up to January 2017. Eligible studies were classified by intervention and accessed for quality using the Quality Assessment Tool for quantitative studies. Sixteen research articles were eligible in the final review; 10 randomized control trial studies were included in the analysis. The meta-analysis revealed that the use of physical restraint was significantly less often in the experimental (education) group (OR = 0.55, 95% CI: 0.39 to 0.78, $p < 0.001$) compared to the control group. Meta-regression revealed the period of post education would have decreased the effect of the restraint educational program (β : 0.08, $p = 0.002$); instead, the longer education period and more times of education would have a stronger effect of reducing the use of physical restraint (β : -0.07 , $p < 0.001$; β : -0.04 , $p = 0.056$). The educational program had an effect on the reduced use of physical restraint. The results of meta-regression suggest that

Conflicts of interest: All authors declare no conflicts of interest.

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<http://dx.doi.org/10.1016/j.kjms.2017.05.012>

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long-term care facilities should provide a continuous education program of physical restraint for caregivers.

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Introduction

The use of physical restraints is a common practice in acute care settings, intensive care units, chronic and long-term health care facilities. Originally, physical forms of restraint were used to protect psychiatric patients from harm in psychiatric hospitals without clear rationale [1]. However, the practice was in existence for at least 50 years and is used in clinical care as congruity care procedures [2,3]. Omnibus Budget Reconciliation Act (OBRA) guidelines defined physical restraints as "Any method or physical or mechanical device, material or equipment attached or adjacent to the resident's body that the individual cannot remove easily, and restricts freedom of movement (standing, walking, lying, turning, sitting) or normal access to one's body". Bed rails were considered as a restraint process since 1992, when the OBRA guidelines were revised. New definition of physical restraints using modified Delphi technique is "Any action or procedure that prevents a person's free body movement to a position of choice and/or normal access to his/her body by the use of any method, attached or adjacent to a person's body that he/she cannot control or remove easily [4,5]." Other studies use different definitions of physical restraints.

Physical restraints were considered as care assistance to prevent falling, maintain gait control, or prevent accidental removal of endotracheal or nasogastric tubes [6–8]. However, the overuse of physical restraints can have adverse effects that are biochemical, physiological, perceptual, behavioral, emotional and social in nature [9,10]. For example, physical restraints may impair circulation and damage nerves [11]. Karlsson et al. emphasized that the use of physical restraints is strongly connected with impaired mobility, behavioral disturbance of residents' functional status and nursing staffs' attitudes [12]. In general, restrained patients experience a lower quality of life, a decreased cognitive function, and a decline in physical functions [13,14].

The decision process regarding the use of restraints is complicated and influenced by the caregiver's characteristics. In order to reduce physical restraints, some alternative interventions have been applied, including policy change, in-service education, individualized care, and participation of gerontological nurse specialists or implementation of a restraint-reduction program [13].

Multi-component intervention is the best approach in reducing physical restraints in countries with well-established welfare systems and constructions for the elderly (Germany, Japan, the Netherlands and et al.), these countries conducting restraint reduce program for decades to ameliorate the restraint abuse phenomenon and achieved great results. However executing multi-

component intervention is difficult to reach immediately in some places, especially in countries with fast population aging rates (e.g. China, Korea, Taiwan and et al.). These countries might not have adequate time to prepare for the aging society. Instead, many countries which have fast population aging rates also have high physical restraint rate (Korea: 84.6%; Hong Kong >62.5%; Taiwan: 62% and et al.) [15–17]. This situation might become worse because of the fast population aging rate and lack of caregivers. Most of the caregiver hope to help their patients, but not certainly have enough knowledge and skills to avoid physical restraints. Educational program is an easier way for long-term care facilities. Or least, it can be a first step to multi-component intervention. The care setting and government should support educational programs including courses, practices and consultations for caregiver, providing them knowledge and skills regarding to physical restraints.

This study aim to verify the effectiveness of education programs or with consultation in reducing physical restraints. Previous systematic review leads to the conclusion that there is insufficient evidence for the efficacy of educational intervention [9]. This study gives this controversial issue a more powerful answer via meta-analysis.

Methods

This study used a comprehensive research and a rigorous methodological assessment of journal articles, summarized the impact of staff involvement in education programs or with consultation to reduce physical restraint in long-term care facilities. The systematic review and meta-analysis methodology followed the guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) collaboration [18].

Search strategy

We reviewed articles available January 1959 up to January 2017 in the following databases: the Cochrane Library, ProQuest, PubMed, EMBASE, EBSCO, Web of Science, Ovid Medline and Physiotherapy Evidence Database (PEDro). Long-term care was used as the search term and was combined with terms for identifying interventions for the caregiver. Keywords searches were for "physical restraint" or "mechanical restraint" or "environmental restraint" (as MeSH terms and free text terms) combined with "long term care" or "nursing home". We checked reference lists of relevant reviews for additional potentially eligible studies (snowball procedure). All references searched were imported into EndNote X7, and titles and abstracts were

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