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Feature Article

The use of non-slip socks to prevent falls among hospitalized older adults: A literature review

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ABSTRACT

Falls among hospitalized older adults are a growing concern. Hospitals are using non-slip socks as an alternative footwear to help prevent falls, however there is limited evidence to support their use. The aim of this article is to review the literature on the effectiveness of non-slip socks to determine if there is sufficient evidence to support their use in the prevention of falls among hospitalized older adults. A comprehensive literature search was conducted using Medline, CINAHL, Scopus, PubMed and the Cochrane Library. Six studies were included in this review. The results suggested that there is inconclusive evidence to support the use of non-slip socks to prevent falls among hospitalized older adults. Non-slip socks do not possess the properties of adequate footwear and have the potential to spread infection. The patient's personal footwear from home is the safest footwear option while admitted into hospital.

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Introduction

Non-slip socks are commonly used as temporary footwear to prevent falls among hospitalized older adults over the age of 65. The occurrence of falls in this population is a growing concern^{1,2} and often results in adverse health outcomes such as fractures, decreased level of physical function, and mortality.^{2,3} A hip fracture is one of the most common complications resulting from a fall, which has a 36% one-year mortality rate.⁴ As such, the prevention of falls among hospitalized older adults is a prominent nursing concern.

A fall is defined as an unplanned event resulting in a patient landing on the hospital floor.^{1,2} The cause of falls among hospitalized older adults are multifactorial.^{5,6} Nursing literature supports the use of interventions that are tailored to individual patients to help reduce falls in hospital and suggests that no one intervention is effective in the prevention of falls.^{5,6} However, one of the most effective interventions is the use of adequate footwear.^{6–8} Adequate footwear is defined as any footwear that is form fitting,

with ankle support, a low heel, and a soft and supportive sole (e.g., Velcro or lace sneakers, slippers ankle support).^{2,3,9,10}

With the high stress associated with hospital admissions, older adults often forget to bring footwear with them to the hospital. For example, many patients arrive to the hospital via ambulance in slippers, socks, or bare feet.¹⁰ As a result, hospitals use non-slip socks as temporary footwear for older adults. Non-slip socks are regular cotton socks with a rubber tread on the top and bottom to improve the grip strength and slip resistance during ambulation. Although these socks provide some foot protection, they do not possess the properties of adequate footwear to help prevent falls. However, manufacturers of non-slip socks market them toward hospitals as “non-skid footwear to help prevent falls”,¹¹ “safe and effective patient slippers [that] are a key component of any fall management program”,¹² and claim that non-slip socks are “effective in helping prevent elderly resident falls, slips and accidents”.¹³

The purpose of this article is to review the literature on the use of non-slip socks to determine if there is sufficient evidence to support their use in the prevention of falls among hospitalized older adults.

Methods

A PICO research question was developed to define the literature search. The research question for the literature review was, *In hospitalized older adults (Population), what is the effect of non-slip*

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socks (Intervention) compared to other footwear (Comparison), in the prevention of falls (Outcome)? A comprehensive literature search was conducted using Ovid Medline, CINAHL, Scopus, PubMed, and the Cochrane Library to include research from the disciplines of nursing, medicine, physiotherapy, occupational therapy, and podiatry. Title and abstract search terms included: non-slip sock*, anti-slip sock*, treaded sock*, gripper sock*, and non-skid sock*. The search was confined to published literature in the English language. A preliminary search that yielded one result used a five-year limit and only studies in the hospital setting. Therefore, due to the limited literature on this topic, all primary research studies that tested non-slip socks as an intervention were selected and year limits were not included.

Results

A total of six primary research studies met the inclusion criteria and were reviewed (Fig. 1). The data was extracted and synthesized into a summary table (Table 1). Two themes emerged: (1) the non-slip properties of non-slip socks,^{14,15,17} and (2) use of non-slip socks as an intervention for falls prevention.^{8,16,18}

Non-slip sock properties

Three studies examined the non-slip properties of non-slip socks.^{14,15,17} One quazi-experimental study tested the slip resistance of non-slip socks and concluded that compression stockings offered better slip resistance than non-slip socks.¹⁴ They also concluded that bare feet provided better slip resistance than non-slip socks and compression stockings.¹⁴ Another study concluded that bare feet provided better slip resistance than non-slip socks, followed by standard socks, as well as determined that the walking patterns were similar for those participants wearing non-slip socks and bare feet.¹⁵ A third quasi-experimental study determined that participants performed equally when wearing non-slip socks and bare feet,

followed by socks, then backless slippers by measuring deceleration time, steps per minute and increased steps per minute.¹⁷

Limitations to the three studies included small sample sizes and using young adults as participants.^{14,15,17} This may limit generalizability of slip resistance to an elderly population or those with mobility issues. Additionally, it is unknown if the participants' feet conditions were examined to determine if they had gait abnormalities that would affect the slip resistance of the non-socks.

Non-slip socks as a fall intervention

Three studies examined the use of non-slip socks as an intervention for falls prevention.^{8,16,18} A quality improvement non-experimental study reported a 9% decrease in falls after the implementation of non-slip socks on a 24-bed nursing unit.¹⁸ The largest reduction in falls occurred in the circumstances from *slipping on the floor with urine* (33% decrease).¹⁸ However, the authors reported an increase in falls from *slipping out of chair* (12%) and *found on floor by nursing staff with an unknown cause of the fall* (19%).¹⁸ A limitation of this study is despite the overall reduction in falls, the authors did not provide any information on the implications of housekeeping or environmental services during the study period which might be associated with the 33% decrease in falls from *slipping on the floor with urine*. Additionally, the authors did not discuss the potential rationales for the increase in the other factors attributing to falls, despite the implementation of non-slip socks.¹⁸ A quazi-experimental study implemented non-slip socks in conjunction with 14 other falls prevention interventions to reduce falls on an acute care unit.⁸ Although there was a reduction in the number of falls, the results were not statistically significant and one is unable to determine which of the 14 interventions were effective.⁸

A final quality improvement retrospective study implemented non-slip socks along with a falls prevention nursing program focusing on patient education and nursing assessments to reduce falls among hospitalized older adults.¹⁶ Despite the implementation

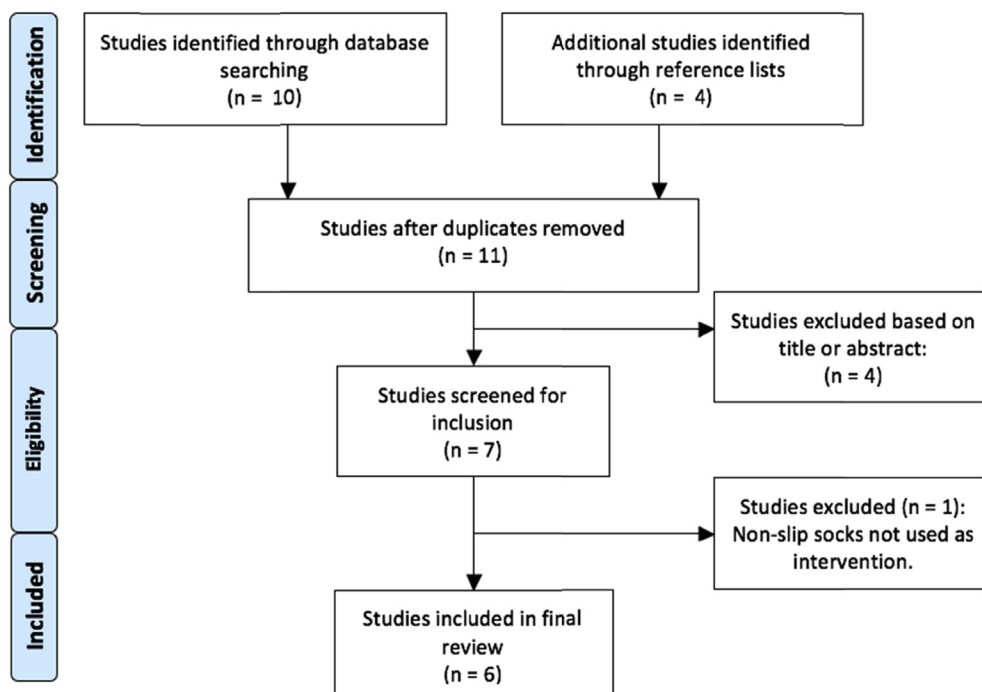


Fig. 1. Literature review flow diagram.

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