Shock-absorbing flooring for fall-related injury prevention in older adults and staff in hospitals and care homes: the SAFEST systematic review

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Declared competing interests of authors: Amy Drahota and Bethany E Keenan collaborated with the Health and Safety Laboratory (2018–20) on some unfunded academic research using a new testing procedure to assess the shock absorbency of various floor coverings. Five flooring manufacturers delivered free samples for use in the project; Amy Drahota and Bethany E Keenan have no stake in any of these companies. In 2015, Amy Drahota was involved in a collaborative funding application with Polyflor Ltd (Manchester, UK) for some SBRI Healthcare innovation funding. The application was shortlisted, but was unsuccessful. Amy Drahota has no stake in Polyflor Ltd. Andrew C Laing reports grants from SofSURFACES Inc. (Petrolia, ON, Canada), and grants and personal fees from SorbaShock LLC (Fort Wayne, IN, USA) and Viconic Sporting (Dearborn, MI, USA) outside the submitted work. Andrew C Laing was a member of an ASTM International Work Group (WK38804), whose technical contact is the president of Seamless Attenuating Technologies (SATECH), Inc. (Chehalis, WA, USA). SATECH, Viconic Sporting and Mannington Mills (Salem, NJ, USA) have donated flooring materials to Andrew C Laing's laboratory that have formed the basis of several studies examining the biomechanical effectiveness of compliant flooring (i.e. safety flooring). Andrew C Laing has never had (nor does he currently have) any financial links to these companies. Chantelle C Lachance is employed at the Canadian Agency for Drugs and Technologies in Health (CADTH) outside the submitted work. Amy Drahota, Dawn C Mackey, Chantelle C Lachance and Andrew C Laing authored original research papers that were included in this review. James Raftery is a member of the National Institute for Health Research Health (NIHR) Technology Assessment and Efficacy and Mechanism Evaluation Editorial Board (2012–present). He was also director of the Wessex Institute, University of Southampton (2005–12), and was concurrently director of the NIHR Evaluation, Trials and Studies Coordinating Centre, part of the Wessex Institute, which was funded by NIHR.

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Plain English summary

SAFEST systematic review

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Aim

The aim of this study was to summarise what is known about shock-absorbing flooring for reducing injurious falls in hospitals and care homes.

Background

Falls and fall-related injuries are a major problem for older adults in both hospitals and care homes. Shock-absorbing flooring (such as carpet, sports floors or specially designed floors) provides a more cushioned surface and is one potential solution to help reduce the impact forces from a fall.

Methods

From literature searches, we identified relevant studies on shock-absorbing flooring use in hospitals and care homes. We gathered data on the quality of the studies' methods, what and who the studies involved, and the study findings. Members of the public were involved throughout the project. They helped improve the clarity of the reporting and collaborated in meetings to help guide the study team.

Findings

One high-quality study in a care home found that vinyl overlay with novel shock-absorbing underlay was no better at reducing injuries than vinyl overlay with plywood underlay on concrete subfloors. We found very low-quality evidence that shock-absorbing flooring may reduce injuries in hospitals and care homes, without increasing falls; if this were true, then economic evidence suggested that shock-absorbing flooring would be the best-value option for patients (lower cost and improved outcomes). There was insufficient evidence to determine the effects of shock-absorbing flooring on fractures or head injuries, although wooden subfloors resulted in fewer hip fractures than concrete subfloors. Shock-absorbing flooring made it harder for staff to move equipment such as beds and trolleys, and led to staff changing how they work.

Implications

The evidence suggests that one type of shock-absorbing floor may not work in care homes, compared with rigid flooring; however, gaps still exist in the knowledge. The evidence in favour of shock-absorbing flooring was of very low quality, meaning it is uncertain. There is a lack of robust evidence in hospitals, which often have concrete subfloors and different population characteristics. If planning to install shock-absorbing flooring, it is important to consider the wider impacts on the workplace and how best to manage these.

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This report

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