The impact of manual handling on nursing home resident mobility during transfers on and off furniture: a systematic review

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CRD summary
This review found that functional training, incorporated into usual care, improved mobility and transfer ability for nursing home residents, but research on manual-handling interventions was lacking. The reliability of these findings is unclear, due to a lack of studies reporting transfer as an outcome, wide variation between studies, and low quality of the evidence.

Authors’ objectives
To evaluate the effect of staff manual-handling procedures on the mobility of nursing-home residents, especially when transferring from one piece of furniture to another.

Searching
MEDLINE, CINAHL, EMBASE, AMED, EBM Reviews, Meditext and PEDro were searched in 2009 for studies in English conducted from 1994 onwards, after the introduction of safe manual-handling policies. The reference lists of relevant articles were checked and grey literature was searched. The search terms were not reported, but details of the search were available from the first author.

Study selection
Studies evaluating safe manual-handling programmes or physical activity programmes involving transfer on and off furniture, such as beds, chairs, and wheelchairs, were eligible for inclusion if they were set in long-term elderly care or nursing homes. The primary outcome was measured in various ways: the residents' ability to transfer on or off furniture, mobility in general, and ability to stand from sitting in a chair. Secondary outcomes were health-related quality of life, staff manual-handling improvements and their sustainability, and costs.

The mean age of participants in the included studies was 81 years (range 70 to 87 years) and most studies had more female than male participants. Most studies were conducted in nursing homes, in multiple centres, and in the USA. One study evaluated the effect of a manual-handling programme on resident transfers and reported functional outcome measures using the Minimum Data Set (MDS). Other studies delivered physical activity interventions, such as individual physiotherapy, or staff training programmes. Outcomes included measures of sit-to-stand actions, staff changes in work practice, and resident independence self-rating. The studies reported few details for sit-to-stand measures (chair height was not reported). Most studies were controlled and control groups received usual care; some other control groups received group exercise or prompted voiding. A wide range of measures was used for secondary outcomes.

A single reviewer selected studies.

Assessment of study quality
Randomised controlled trials (RCTs) were evaluated using the Consolidated Standards of Reporting Trials (CONSORT) checklist for randomisation and allocation methods, blinding, and use of intention-to-treat analysis. Quasi-experimental studies were evaluated with the Critical Appraisal Skills Programme (CASP) tool, which assessed outcomes measures.

For all studies, the reviewers assessed the equivalence of groups at baseline, the reporting of adverse events, and the use of a power test. The authors did not state how many reviewers performed the assessments.

Data extraction
Descriptive data were extracted for the study outcomes. In most cases, whether or not the study findings were statistically significant was reported. The authors did not state how many reviewers extracted the data.

Methods of synthesis
Studies were combined in a narrative synthesis. Findings were organised by outcome measure and type of intervention. Where several studies reported the same outcome, vote counting was used to indicate the proportion of studies that had positive findings.

**Results of the review**

Eight primary studies were included. Five were RCTs, with 848 participants (range 61 to 383), and three were quasi-experimental studies, with 585 participants (range 111 to 340); these were a pre-post study, a retrospective observational study, and an implementation project with outcome evaluation. An acceptable method of randomisation and allocation concealment were clearly reported for one RCT, and one RCT conducted intention-to-treat analysis. In three RCTs, outcome assessment was partly or fully blinded. Groups were comparable at baseline in seven of the eight studies; one study reported a power calculation; and none reported adverse events. Follow-up ranged from eight weeks to one year.

Five studies were of physical activity interventions. There was significant benefit with intervention in three out of four studies reporting sit-to-stand function and one study reporting mobility. One study of a multifaceted safe patient-handling programme found a significant improvement in resident self-transfer, but the need for assistance did not significantly change (one study). One study found no significant effect from staff training in manual handling on resident independence.

Staff manual-handling training led to a change in manual-handling practice for 68% of staff in one study. In another study, 68% of staff reported that training increased their acceptance and compliance with the manual-handling programme and 75% thought that there was improved competency in handling techniques. Evidence on health-related quality of life was limited and inconclusive.

**Cost information**

A physical activity intervention cost three times as much, in staff time, as usual care. This intervention was designed to be delivered by care staff, such as nurse aides, rather than by highly trained staff, such as physiotherapists.

**Authors’ conclusions**

Functional training, incorporated into usual care, improved mobility and transfer ability for nursing home residents, but research on manual-handling interventions was lacking.

**CRD commentary**

The objectives and inclusion criteria were not entirely clear, as the intervention and outcomes were not consistently defined. It seems that the decision to use sit-to-stand measures as the primary outcome was made after the search, due to a lack of studies on the ability to transfer. It was unclear to what extent these sit-to-stand measures were reliable as a proxy for transfer on and off furniture. Relevant sources were searched for studies, but the inclusion was limited to studies in English, introducing a risk of language bias. It was unclear whether unpublished studies were eligible for inclusion, which could have introduced a risk of publication bias. It seems that insufficient efforts were made to minimise the risk of reviewer bias and error, as studies were selected by one reviewer. It was not reported how many reviewers assessed quality and extracted data. No details of the control were provided for most of the studies, and follow-up rates were not reported.

The choice of a narrative synthesis to combine the studies was appropriate, in view of the differences between them. The findings were difficult to interpret as no comparative statistical data for the effects (p values) or measures of statistical variation, such as confidence intervals, were reported. As the authors noted, the review was limited by the small number and limited quality of the included studies and variation between them, especially for the outcome measures.

The reliability of the authors’ findings is unclear, due to limitations in the review, such as a lack of studies reporting transfer as an outcome, wide variation between studies, and low quality of evidence.

**Implications of the review for practice and research**

**Practice:** The authors stated that the mobility and independence of nursing home residents could be improved by functional training delivered by care staff during daily activities. They suggested that nurses could gain the necessary
skills in collaboration with physiotherapists and by learning other aspects of safe manual-handling, such as use of equipment.

**Research:** The authors stated that large studies of safe manual-handling practices were needed, concentrating on the assistive relationship between staff and residents, the structures and processes of resident care, and the link between care and quality of life. Cost-benefit analyses of different staff and care protocols should be conducted.

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