The efficacy of interventions for low back pain in nurses: A systematic review

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ARTICLE INFO

ABSTRACT

Objectives: To investigate the efficacy of interventions for the prevention and treatment of low back pain in nurses.

Design: Systematic review.

Data sources: The review was registered on the PROSPERO database (CRD42015026941) and followed the PRISMA statement guidelines. A two phase approach was used. In phase one, all randomised controlled trials included in the systematic review of Dawson et al. (2007) which reviewed interventions for low back pain in nurses until 2004 were selected. In phase two, relevant randomised controlled trials and cluster randomised controlled trials published from 2004 until December 2015 were identified by an electronic search of nine databases (Embase, CINAHL, SPORTDiscus, PsycARTICLES, Cochrane Library, Web of Science, PEDro, Scopus and MEDLINE). To be eligible, trials had to examine the efficacy of interventions either for the prevention or treatment of low back pain in nurses. Primary outcomes of interest were any measure of pain and/or disability.

Review methods: Three reviewers independently assessed eligibility and two reviewers independently conducted a risk of bias assessment (Cochrane Back and Neck Group).

Results: Four studies were retrieved from phase one. In phase two, 15,628 titles and abstracts were scanned. From these, 150 full-text studies were retrieved and ten were eligible. Fourteen studies (four from phase one, ten from phase two) were eligible for risk of bias assessment. The included trials were highly heterogeneous, differing in pain and disability outcome measures, types of intervention, types of control group and follow-up durations. Only four of the included studies (n = 644 subjects) had a low risk of bias (≥6/12). Manual handling training and stress management in isolation were not effective in nurses with and without low back pain (risk of bias, 7/12, n = 210); the addition of a stretching exercise intervention was better than only performing usual activities (risk of bias, 6/12, n = 127); combining manual handling training and back school was better than passive physiotherapy (risk of bias, 7/12, n = 124); and a multidimensional intervention (risk of bias, 7/12, n = 183) was not superior to a general exercise program in reducing low back pain in nurses.

Conclusions: Only four relevant low risk of bias randomised controlled trials were found. At present there is no strong evidence of efficacy for any intervention in preventing or treating low back pain in nurses. Additional high quality randomised controlled trials are required. It may be worth exploring the efficacy of more individualised multidimensional interventions for low back pain in the nursing population.

What is already known about the topic?

- Low back pain in nurses and nursing aides is a common, recurrent and costly health problem, and is one of the leading causes of disability.
- Nursing has been identified amongst the top professions at risk of low back pain, even exceeding those in heavy industry.
- It is unclear what interventions are effective in the prevention, or

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treatment, of low back pain among nurses.

What this paper adds

- There is no strong evidence for any intervention in preventing or treating low back pain in nurses.
- The widespread use of "no-lift" policies and strong focus on "correct" lifting technique is not supported by strong evidence.
- Additional high quality randomised controlled trials are required to examine the efficacy of more targeted multidimensional interventions for low back pain among nurses.

1. Introduction

Low back pain is a common, recurrent and costly health problem worldwide (Nielens et al., 2006). Low back pain affects between 51 and 90% of people at some point during their lifetime (Airaksinen et al., 2006; Wieser et al., 2010). The course of low back pain is often characterised by a recurring pattern of complaints (Deyo and Weinstein, 2001). It has been demonstrated that low back pain is one of the main reasons for seeking medical care (Katz, 2006; Waddell, 2004). It causes an enormous medical and economic burden on individuals, families, communities, industry and governments (Dieleman et al., 2016; Hoy et al., 2010; Rossignol et al., 2009).

Nursing has been identified amongst the top professions at risk of low back pain (Jensen, 1987; Yassi and Lockhart, 2013), with low back pain rates exceeding those employed in heavy industry (Engst et al., 2005). Genevay et al. (2011) found that being a nurse is independently related to spinal pain. The year prevalence of low back pain in nurses has a mean of 70% (Abolfotouh et al., 2015; Dawson et al., 2011; June and Cho, 2011) and the lifetime prevalence ranges from 35 to 80% (Hignett, 1996; Maul et al., 2003; Vieira et al., 2006). Recurrence rates of low back pain in nurses exceed 70% (Burdorf and Jansen, 2006).

The impact of low back pain for nurses is large and includes work absenteeism, increased risk of chronicity, associated personal and economic costs, reduced nursing workforce efficiency (presenteeism), decreased quality of life, and burnout (Cohen-Mansfield et al., 1996). Unsurprisingly, several studies have demonstrated an association between work-related low back pain, negative beliefs, reduced job satisfaction and burnout or days off work in nurses (Mitchell et al., 2008; Sorour and El-Maksoud, 2012; Urquhart et al., 2013).

Initially, ergonomic factors were seen as the most important risk factor for low back pain in nurses. However, it has recently been shown that nursing can be a stressful profession and that several other individual, physical, psychosocial and lifestyle factors can play a crucial role (Adams et al., 1999; Bernal et al., 2015; Coggon et al., 2013; da Costa and Vieira, 2010; Harcombe et al., 2010; Klaber Moffett et al., 1993; Martel et al., 2010; Sorour and El-Maksoud, 2012; Stroyer and Jensen, 2008).

Over recent decades, significant resources have been invested in an attempt to reduce the prevalence of low back pain among nurses. Interventions have been mostly focused on physical characteristics such as lifting, and the use of ergonomic devices. This included low back pain education and awareness training (Guthrie et al., 2004; Hodder et al., 2010a,b; Kindblom-Rising et al., 2011), manual handling training (Hodder et al., 2010a,b; Yassi et al., 2001) and various means of mechanical lifts and lift assists (Engst et al., 2005; Guthrie et al., 2004; Pellino et al., 2006) such as lift teams (Edlich et al., 2004), transfer belts and mechanical floor lifts (Evanoff et al., 2003; Li et al., 2004) and ceiling lifts (Alamgir et al., 2009; Engst et al., 2005; Li et al., 2004). A systematic review by Dawson et al. (2007) revealed that unidimensional interventions, such as manual handling training or stress management as a sole treatment option, were ineffective. They highlighted the potential role for multidimensional interventions to treat and prevent low back pain in nurses (Dawson et al., 2007).

Since this systematic review by Dawson et al. (2007), no recent

systematic reviews have been conducted. Therefore the aim of this systematic review was to determine whether there are more recent interventions showing efficacy in either the (i) prevention of low back pain in nurses who are pain free or (ii) treatment of low back pain in nurses.

2. Methods

2.1. Literature search strategy

This review was registered on the PROSPERO database (CRD42015026941) and has been reported in accordance with the PRISMA statement (Moher et al., 2009).

A two phase approach was taken to expedite the search process while preserving rigour and preventing bias. In phase one, randomised controlled trials included in the systematic review of Dawson et al. (2007) which reviewed interventions for low back pain in nurses up until December 2004, were selected. In phase two, all relevant randomised controlled trials and cluster randomised controlled trials published since the previous review and meeting the inclusion criteria (see below) were identified by;

- A search of nine electronic databases (Embase, CINAHL, SPORTDiscus, PsycARTICLES, Cochrane Library, Web of Science, PEDro, Scopus and MEDLINE) from 2004 till December 2015 using the search strategy recommended by the Cochrane Back and Neck Group (Fig. 1).
- Scanning the reference lists of previous systematic reviews and the eligible studies for further References

Three independent reviewers (WVH, NDD, JDR) conducted the electronic searches across all databases. The strategy had five components which were combined: (1) lumbar AND (2) pain AND (3) nurse AND (4) randomised controlled trial and NOT (5) non-musculoskeletal conditions (e.g. cancer). The specific focus of the search was any intervention (prevention or treatment) for low back pain in nurses. All randomised controlled trials from phase one and two were assessed for eligibility using strict inclusion and exclusion criteria and were all critically appraised using the same risk of bias assessment, even if they had been appraised in the original review by Dawson et al. (2007) (Fig. 1).

2.2. Inclusion and exclusion criteria

2.2.1. Study design

Only studies (from phase one and two) of completed randomised controlled trials published in peer-reviewed journals written in English, German, French or Dutch were included.

2.2.2. Population

Studies including nurses with non-specific low back pain between 18 and 65 years of age were included. Low back pain was defined as pain in the area bounded by the bottom of the rib cage and the buttock creases and without dominant patho-anatomical findings. Participants needed to have a minimum of one episode of low back pain causing pain and/or disability and/or seeking care and/or sick leave in the previous two years. Studies involving participants with specific pathologies/conditions (e.g. pregnancy, "red flag" disorders (e.g. spinal cord compression/cauda equina, spinal cord injury, cancer, fracture) or neurological, cardiac, renal or respiratory, rheumatological conditions) were excluded. Low back pain prevention studies could also include non-low back pain subjects.

All grades of nurses, nursing aides, nursing assistants, nursing students and home care workers were eligible. Studies including other cohorts (e.g. administrative- or technical staff) where the data of the nursing cohort could not be extracted were excluded.