



Review article

Identifying risk factors for first-episode neck pain: A systematic review

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ABSTRACT

Neck pain affects 15.1% of the United States' general population every 3 months, and ranks fourth in global disability. Because of the tendency for neck pain to become a chronic issue, it is important to identify risk factors that could encourage prevention and early diagnosis. The purpose of this systematic review was to identify risk factors for a first episode of neck pain. Three databases were searched with key words such as “neck pain” and “first incidence.” Risk factors from the resulting articles were reported as either a physical or psychosocial risk factor and ranked by the strength of their odds/risk/hazard ratio: < 1.0 (protective factor), 1.0–1.5 (minor risk), 1.5–2.0 (moderate risk), or 2.0+ (major risk). Out of 878 total articles, 10 articles met our inclusion criteria. Of these studies, a global incidence rate for neck pain was calculated to be 16.2%. The strongest psychosocial risk factors were depressed mood, high role conflict, and perceived muscular tension. There were no major physical risk factors (2.0+), but the most commonly reported risk factor was work in awkward/sustained postures. Protective measures found included high perceived empowering leadership, high perceived social climate, leisure physical activity, and cervical extensor endurance. Most risk factors found for neck pain were related to psychosocial characteristics, rather than physical characteristics. A number of these risk factors were mediating factors, suggesting that a prevention-based program may be useful in modifying the existence of the risk factors before the occurrence of neck pain.

1. Introduction

Neck pain is a major global health problem as well as a common complaint seen in the United States. According to a 2009 Centers for Disease Control and Prevention (CDC) survey, neck pain affects 15.1% of the United States population every 3 months. Globally, neck pain ranks fourth for disability and twenty-first in overall global burden of pain (Hoy et al., 2014). This condition not only impacts the individual, but also their families and their community, causing significant economic consequences (Hoy et al., 2014). Consequences range from an increase in health care expenditure, more missed days from work, reduced work productivity, and a rise in insurance costs (Hoy et al., 2014).

The identification of risk factors for the development of neck pain can help identify scenarios and or individuals who may be predisposed to the development of neck pain or recurrent episodes, which can become a chronic, disabling, and expensive condition (Wright et al., 1999). Additionally, identifying risk factors for neck pain can provide information to develop occupational, ergonomic, and prevention

programs in healthcare settings. The most recent and comprehensive systematic review examining risk factors for development of neck pain was published by McLean et al. (2010). Since its publication in 2010 (McLean et al., 2010), there have been a number of articles published regarding risk factors for the development of neck pain. Furthermore, McLean and colleagues did not define whether the risk factors reported were modifiable. Jun et al. also studied risk factors for neck pain; however, they only focused on physical risk factors (Jun et al., 2017). The objective of our review was to add to the current body of literature by identifying risk factors for the development of neck pain from a pain-free state or from a recurrent episode in longitudinal and observational studies.

2. Methods

2.1. Study design

This systematic review follows the guidelines from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

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¹ All authors contributed towards the writing, data extraction, and editorial process of the systematic review.

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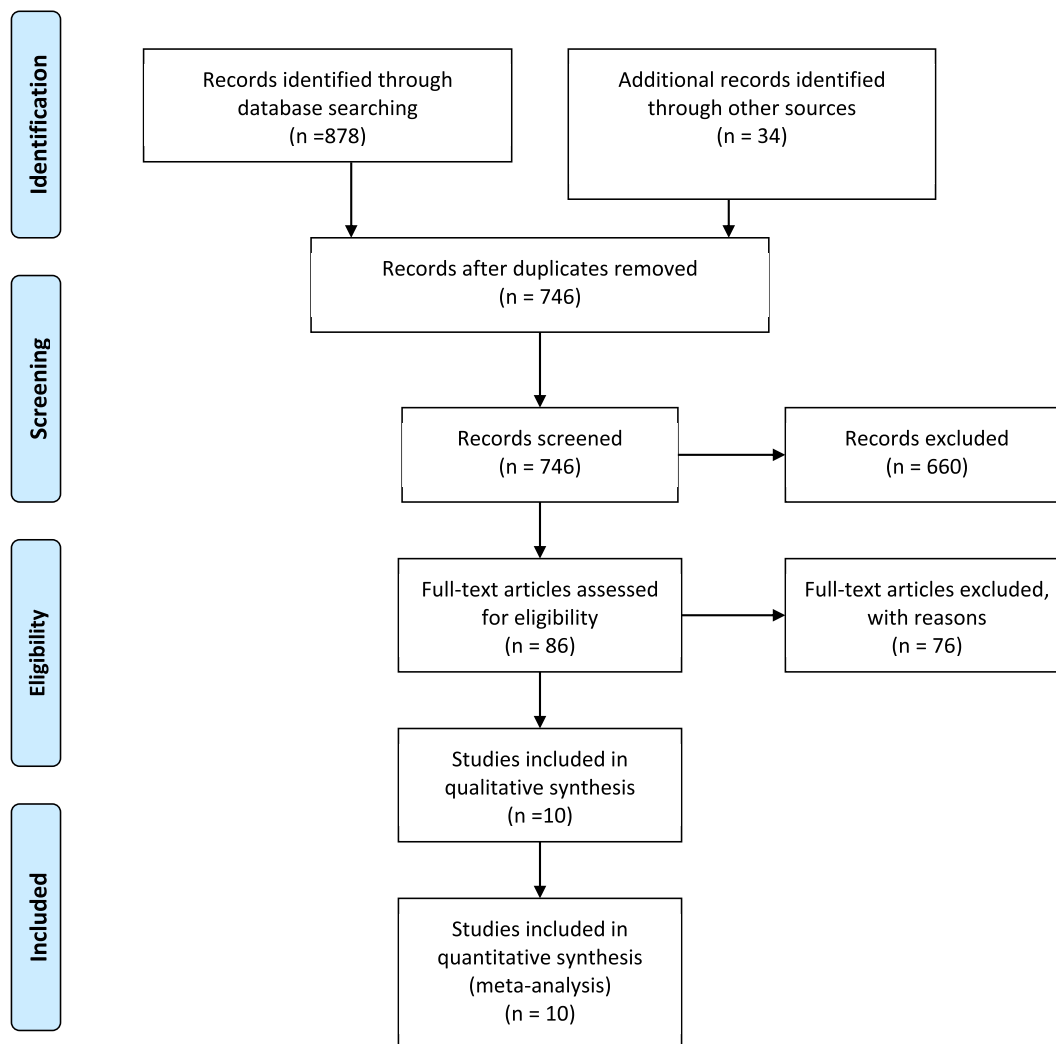


Fig. 1. PRISMA Flow Diagram.

Statement (Liberati et al., 2009).

2.2. Search strategy

Three databases, PubMed, Embase, and CINAHL were accessed on February 2, 2017. The following search terms were used for Embase and CINAHL: “Neck Pain,” “first incidence OR prognosis OR risk factor OR first onset OR first episode,” “risk factors OR risk factor.” Search strategy for PubMed is cited in Appendix A with the following search terms, “Neck Pain” [MeSH], “cohort studies” [MeSH], “First onset[tiab] OR first episode [tiab],” “longitudinal studies” [MeSH]. Filters for human subjects and the English language were applied to the search. No limitation was placed on the date of publication.

2.3. Eligibility criteria

Only longitudinal, observational, cohort studies were considered eligible for inclusion. At baseline, subjects were required to be ≥ 18 years of age and in a pain free state (for any period of time) at the time of enrollment in the study (Taylor et al., 2014). We did include studies involving patients with recurrent neck pain who were pain-free during the enrollment of the study. Neck pain was defined as pain within the cervical spine and muscles originating from the cervical region acting on the head and shoulders (Borghouts et al., 1998). Articles that reported incidence rates for neck pain in combination with pain in other areas of the body were not considered. In this review, we were

interested in identifying physical, psychosocial and individual level (demographic) factors. Studies that failed to report an odds ratio, relative risk, or hazard ratios (ORs, RRs, HRs, respectively) for risk factors were excluded (Taylor et al., 2014).

Operationally, odds ratios represent the odds that a particular outcome would occur, given a specific exposure (Szumilas, 2010). In comparison, risk ratios are the ratio of risk that subjects will develop the outcome, given a specific exposure (Sistrom and Garvan, 2004). Hazard ratios describe the relative likelihood of complication (i.e. neck pain) on the basis of compared event rates (Spruance et al., 2004).

2.4. Study selection

Two reviewers (KC and CW) independently evaluated potentially eligible studies that were captured in the initial search. All articles were screened by title and abstract, with one author (RK) serving as the consensus reviewer for inclusion. Two authors (KC and RK or CW and RK) then completed full-text reads to include or exclude a study based on our criteria described previously. Consensus for inclusion was achieved with the help of a third author (CW or KC) as needed.

2.5. Data collection and extraction

From each study, the number of subjects, age of the population, type of population studied (population was categorized into either community or occupational), the follow-up period, the episode of neck pain,

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