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None declared.

Prevalence and influencing factors of occupational pneumoconiosis: A systematic review and meta-analysis

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Review question / Objective: **The aim of this systematic review was to address and explore the prevalence of pneumoconiosis and effect size of different influencing factors. What is the prevalence of pneumoconiosis and the effect size of influencing factors for occupational dust exposed workers?**
Condition being studied: **Pneumoconiosis is inclusive of a group of serious pulmonary diseases associated with the inhalation of mineral dusts and corresponding reactions of lung tissues, including diffuse fibrosis and progressive lung dysfunction. Some studies have reported a downward trend since 2015—around 527,500 cases of prevalence with about 60,000 new patients reported globally in 2017 corresponds with around 1,111,000 cases of prevalence with about 99,000 new patients reported globally in 2016. However, it is still escalating in some regions, especially countries with a large number of workers.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 04 April 2022 and was last updated on 04 April 2022 (registration number INPLASY202240019).

INTRODUCTION

Review question / Objective: **The aim of this systematic review was to address and explore the prevalence of pneumoconiosis and effect size of different influencing factors. What is the prevalence of pneumoconiosis and the effect size of influencing factors for occupational dust exposed workers?**

Rationale: **Some targeted prevention for current status of pneumoconiosis may be much in demand now. Targeted prevention requires a further understanding of the influencing factors. Due to the scarce and controversial available evidence, moreover,**

there is no meta-analysis and systematic review that summary related research results, we conducted the current systematic review and meta-analysis to review the prevalence and influencing factors of pneumoconiosis worldwide.

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METHODS

Search strategy: Two reviewers systematically and searched the literature published before November 2021 in online databases, including PubMed, EMBASE, the Cochrane Library and Web of science, with no limitation on language or time of publication by using search terms related to "pneumoconiosis" and "cohort studies". Any differences in the literature search process were resolved through a full discussion with a third reviewer.

Participant or population: Occupational dust exposed workers.

Intervention: Factors increasing prevalence of pneumoconiosis.

Comparator: Factors decreasing prevalence of pneumoconiosis.

Study designs to be included: Cohort Studies.

Eligibility criteria: Studies included in this meta-analysis must meet the following criteria: (1) all involving occupational dust exposure workers (exposed to silica dust in any periodof their work history) are divided into with-pneumoconiosis group and without-pneumoconiosis group according to the national diagnostic criteria of pneumoconiosis; (2) at least one variable investigated as an influencing factor for morbidity of pneumoconiosis; (3) the outcome was the number of workers with and without pneumoconiosis under the condition of with and without exposure or with different levels of exposure. (4) cohort study designs.

Information sources: Electronic databases, contact with authors and trial registers.

Main outcome(s): The pooled prevalence of pneumoconiosis; influencing factors and the pooled effect size of them.

Quality assessment / Risk of bias analysis: The quality of the included studies will be assessed independently by two authors using the Newcastle Ottawa Scale (NOS). The NOS contains eight categories relating to methodological quality and each study will be given an eventual score out of a maximum of 9 points. A score of 0~6 points equate to a low-quality study, and a score of 7~9 points equate to a high-quality study. Egger's linear regression test and funnel plot will be used to test publication bias.Any disagreements about quality assessment will be resolved through a full discussion with a third reviewer.

Strategy of data synthesis: Statistical analyses will be undertaken using Review Manager 5.4 (The Cochrane Collaboration, Copenhagen, Denmark), Stata 16.1 software (Stata Corp. TX, 2019) and R 4.1.3 Software. First of all, for exploring the prevalence of pneumoconiosis in dust exposed workers, the pooled prevalence and its 95% confidence intervals (CIs) will be calculated by using a random-effect model. Second, in the study of the association between potentially influencing factors and prevalence of pneumoconiosis, the risk ratios (RRs) and its 95% CIs will be calculated by using a random-effect model. Third, we plan to explore the relation between exposure to occupational dust and pneumoconiosis through two aspects: duration of dust exposure and CTD, and

will apply the two-stage approach for dose-response meta-analysis.

Subgroup analysis: We will divide the data into small groups based on type of pneumoconiosis (CWP versus other type of pneumoconiosis), occupational category for CWP and study quality (NOS<7 versus NOS≥7), and then will compare across subgroups.

Sensitivity analysis: The sensitive analysis will be conducted by forest plot of omitting each study.

Country(ies) involved: China.

Keywords: pneumoconiosis; pooled prevalence; influencing factors; pooled effect size; dose-response meta-analysis.

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