

INPLASY

Work stress and Its Association with Cardiovascular Events in Occupational Populations: A Systematic Review and Meta-Analysis

INPLASY2024100088

doi: 10.37766/inplasy2024.10.0088

Received: 20 October 2024

Published: 20 October 2024

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ADMINISTRATIVE INFORMATION

Support - This work was supported by the Natural Science Foundation of Shanghai [grant number 23ZR1463600]; and the Shanghai Medical Trade Union Committee Key Project [grant number 2024YGL09].

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2024100088

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 20 October 2024 and was last updated on 20 October 2024.

INTRODUCTION

Review question / Objective This systematic review and meta-analysis focused on comparing the efficacy of different work stress assessment tools in predicting cardiovascular events.

Condition being studied Cohort studies that provided quantitative estimates of the association between work stress and cardiovascular events.

METHODS

Participant or population General population of working age (no specific age limit).

Intervention Exposure factors are work-related stress; using standardized questionnaires to assess work stress.

Comparator Not Applicable.

Study designs to be included Inclusion criteria:(1) cohort study;(2) general population of working age (no specific age limit); (3) exposure factors are work-related stress; (4) using standardized questionnaires to assess work stress. (5) reporting the hazard ratio (HR) between work stress and the risk of CVD and adverse events. (6) article language is English.

Eligibility criteria We excluded conference abstracts, letters, commentaries, case reports, reviews, Full text not available, duplicate publications, clinical trials and so on.

Information sources From the inception of the databases to September 2023, we systematically searched PubMed, Web of science, Scopus, Cochrane and Embase databases for both journal articles and conference papers. Furthermore, we

scrutinised the bibliographies of all included studies for any titles that were initially missed in the primary literature search.

Main outcome(s) Eighteen articles involving 257,101 subjects were included. The studies were carried out between 2002 and 2023, with follow-up durations ranging from 3 to 25 years. Participants ranged in age from 18 to 65. Overall, the pooled effect size indicated a 26% increase in the risk of cardiovascular events among individuals experiencing work stress during the follow-up period (HR=1.26; 95%CI:1.19 to 1.34; $p<0.001$). In subgroup analyses stratified by assessment scale, the Job Content Questionnaire (JCQ) demonstrated a statistically significant association between work stress and cardiovascular events (HR=1.25; 95% CI:1.17 to 1.34; $p<0.001$; $I^2=11.4\%$). When assessed with the Effort-Reward Imbalance (ERI) scale, work stress also demonstrated statistically significant effects, but with notable heterogeneity (HR = 1.30; 95%CI: 1.15 to 1.47; $p = 0.084$; $I^2 = 54.9\%$). When categorized by event type, the increase of work stress level elevated the risk of specific cardiovascular events, including coronary heart disease (HR=1.2).

Quality assessment / Risk of bias analysis Two researchers (H. Dong and S. Yang) independently assessed the incorporated studies used the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for cohort studies, and resolved any inconsistencies through discussions with another author (J. Wu). The instrument comprises 11 assessment criteria, necessitating the researcher to determine "yes," "no," "unclear," or "not applicable." If the response was affirmative, the question received a score of 1. If the response was negative, uncertain, or not relevant, it received a score of 0. Following a group discussion, a decision is then made to either include or exclude, or seek further info the study. Additionally, to estimate potential publication bias, Begg's and Egger's tests were carried out, and the funnel plots were visually inspected.

Strategy of data synthesis All statistical analyses for this study were conducted using Stata data analysis software (version 17.0, Stata Corporation). In the analysis of cohort studies, hazard ratios (HR) and 95% confidence intervals (CIs) were used as the effect size to report the outcomes of this meta-analysis. Calculation of I^2 went to evaluate heterogeneity between studies, and determine the suitable effects model. If the I^2 value is more than 50 per cent, a random effects model is used, otherwise, a fixed effects model is used.

Subgroup analysis Subgroup analysis was then performed on scales, outcomes, study sites, follow-up time, race, and occupational types to identify sources of heterogeneity. Forest plots were utilized to visually present the outcomes of the meta-analysis.

Sensitivity analysis sensitivity analyses were performed by sequentially excluding each study and employing the fill and trim method.

Country(ies) involved China.

Keywords Cardiovascular events; Effort–reward imbalance (ERI) scale; Work stress; Job content questionnaire (JCQ); Meta-analysis.

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Author 2 - Shenglan Yang.
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