**PROPOSAL: META-ANALYSIS ON RESPIRATORY-CARDIAC EFFECTS OF AIR POLLUTION ACROSS DIFFERENT AGE GROUPS AND GENDER**

**Background:**

Air pollution is a major public health concern worldwide, and exposure to air pollutants has been linked to respiratory and cardiovascular diseases (Brook et al., 2010). However, the effects of air pollution on health outcomes may vary depending on age and gender, as different groups may have different susceptibility to the health effects of air pollution. Meta-analysis can be used to synthesize the findings of multiple studies and provide a more precise estimate of the respiratory-cardiac effects of air pollution across different age groups and gender.

**Aims and Objectives:**The key objective of this meta-analysis is to evaluate the respiratory-cardiac effects of air pollution across different age groups and gender. The specific objectives are to:

* Determine the effect size of air pollution on respiratory and cardiac health outcomes, such as asthma, chronic obstructive pulmonary disease (COPD), and heart disease, across different age groups and gender.
* Assess the heterogeneity of the studies included in the meta-analysis.
* Identify potential sources of bias and confounding in the studies included in the meta-analysis

**Methods:**

A systematic search will be conducted on Scopus and PubMed to identify relevant articles published in the last 10 years (2012-2022). The search will use a combination of keywords such as "air pollution", "respiratory", "cardiac", "age groups", and "gender". The inclusion criteria will be observational studies that: (1) evaluated the respiratory-cardiac effects of air pollution, (2) included participants of different age groups and gender, (3) used quantitative methods to estimate the effect size of air pollution, and (4) were published in English. The exclusion criteria will be studies that: (1) used non-human subjects, (2) used qualitative methods, (3) were reviews or meta-analyses, and (4) had a follow-up duration of less than 6 months.

The selected studies will be assessed for quality. The effect size of air pollution on respiratory and cardiac health outcomes will be calculated using random-effects meta-analysis, which accounts for the heterogeneity of the studies (Cai et al., 2019). The heterogeneity of the studies will be assessed using the I-squared statistic, which measures the percentage of total variation across studies due to heterogeneity rather than chance .Funnel plots and Egger's regression test will be used to assess publication bias (Liu et al., 2016). The meta-analysis will be conducted using Excel software. The effect size and 95% confidence interval will be calculated for each study, and the summary effect size will be calculated using the weighted mean effect size.

**References:**

Brook, R.D., Bhatnagar, A., Rajagopalan, S., Pope III, C.A., Brook, J.R., Diez-Roux, A.V., Holguin, F., Ogneva-Himmelberger, Y., Peters, A., Stamler, J., & Turner, S.C. (2010). Particulate matter air pollution and cardiovascular disease: An update to the scientific statement from the American Heart Association. Circulation, 121(21), 2331-2378.

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