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Publication bias in prevalence studies should not be ignored

Masoud Mohammadi[1,2]*

Dear Editor,

One of the indicators considered in assessing the comprehensiveness of systematic reviews and meta-analyses is the examination of publication bias. Publication bias indicates the bias of published studies and occurs when certain results of research are published more often because they are positive or interesting, and negative or insignificant results are often not published. This can cause deviations in the research literature [1–3]. Publication bias in meta-analyses leads to inaccurate determination of the association between an exposure and an outcome. Furthermore, the association between exposure and outcome may be over- or under-reported [1–3].

When literature searches in systematic reviews and meta-analyses are based on the type of research (published or unpublished), the results of the sampling of studies can have publication bias. The most important strategy for dealing with missing studies in the literature search process is to identify publication bias, and the simplest and most common method for identifying publication bias is the funnel plot [4, 5].

First, we need to provide an explanation of prevalence studies and the concept of publication bias in these studies, and then explain the funnel plot for examining publication bias. according to the definition of publication

bias, which means not publishing articles that have non-significant results, and in this case, it is said that in prevalence studies, prevalence itself is not related to significance and is always reported because prevalence is a ratio and does not show a relationship, but it should be noted that not all articles have a cross-sectional method and can be descriptive, analytical or observational and report prevalence in the form of examining relationships in the study. In this case, if the results of the study show a non-significant relationship, reporting a prevalence alone will not be very useful, and in this case, the prevalence obtained in these studies will be the victim of obtaining non-significant results in examining relationships and may not be reported.

A funnel plot is a scatterplot that plots the effect size on the horizontal axis and the sample size, variance, standard error, or weight of each study on the vertical axis. In meta-analyses without publication bias, a funnel plot resembles a funnel with the effect size of studies with small sample sizes and high variance at the large end [4, 5]. Also, at the small end of this funnel are the effect sizes of studies with large sample sizes and smaller variance. In the middle of this funnel are studies with medium effect sizes. The symmetry of the left and right sides of the funnel plot indicates the absence of publication bias [4, 5]. Funnel plot asymmetry indicates the presence of publication bias in meta-analysis. If small studies with small sample sizes are neglected and are included in the missing studies, a gap and asymmetry are created in the large part of the funnel [4, 5]. Now, according to the explanations given, a question arises, in studies that report the prevalence of a risk factor or a disease, how can one have a symmetrical funnel plot?

*Correspondence:
Masoud Mohammadi
masoud.mohammadi1989@yahoo.com
[1] Department of Epidemiology and Biostatistics, Faculty of Health, Isfahan University of Medical Science, Isfahan, Iran
[2] Research Center for Social Determinants of Health, Jahrom University of Medical Sciences, Jahrom, Iran

Since we know that the range of prevalence is from zero to one, given that it is a proportion, in this case, if the range of the funnel is negative infinity $(-\infty)$ to positive infinity $(+\infty)$, then all studies should be collected on the right side of the funnel, and of course, this is a logically correct interpretation and has led some researchers to be indifferent to publication bias in prevalence studies with this interpretation.

The answer is that the software uses log to form the funnel and will calculate the log event (prevalence) for the prevalence. In this case, by adding log to the prevalence, its range will change from zero to 1 to negative infinity $(-\infty)$ to positive infinity $(+\infty)$, and the necessary conditions for examining the propagation bias are provided. Therefore, this explanation makes researchers not indifferent to examining this indicator in prevalence studies.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The author declare that they have no competing interests.

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