LETTER TO THE EDITOR

ARE DIRECTEDACYCLICGRAPHS (DAGS) AN IMPORTANT TOOL TO PERFORM OBSERVATIONAL STUDIES?

REFLECTIONS FROM A CASE IN BURNED PATIENTS

To the Editor,

With great interest, we read the study by Costa Santos et al., published in the last issue of Annals of Burns and Fire Disasters. The objective of this research was to establish whether epidemiologic differences in the elderly contribute to higher mortality compared to younger patients. However, we would like to make some observations on this manuscript. Regarding the age variable, it can be deduced that this is an effect modification analysis, although the authors did not explicitly express this in the article. Nevertheless, the role of age in the analysis should be re-evaluated to define if this variable produces an effect modification or if it is a confounding factor; two conditions that require different methodological approaches to obtain an adequate control.

According to the classical definition, a confounding factor must meet the following criteria: 1) it must be a risk factor for outcome among the unexposed; 2) it must be associated with the exposure variable in the source population from which the subjects arise; 3) it must not be an intermediate step in the causal pathway between exposure and the disease, also, it must not be affected by exposure. On the other hand, the definition of effect modification mentions that the strength of the association between exposure and outcome differs according to the level of another variable (effect modifier variable). Therefore, the use of strategies with modern approaches is required to control the confounding factor, such as the directed acyclic graph (DAG). The DAG allows us to identify which confounding variables meet the criteria of the “backdoor way” because having a variable set may be sufficient for adjustment, but it may be unnecessary to adjust all the variables in the set (Fig. 1).

Fig. 1 – Representation of the backdoor way – directed acyclic graph (DAG).

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In that sense, we propose that the age variable would not be presented as an effect modifier variable, but rather as a confounding variable. In the Costa Santos et al. article, we understood that age would be associated with exposure (comorbidities and complications) and it could produce the outcome (mortality), but the authors do not include any discussion about the role of age in the causal pathway. In this context, DAGs could be an important strategy for deliberating the role of age in the association (Fig. 2).

In conclusion, confounding is one of the foremost threats to the validity of a study and its control is a major challenge in the causal inference arena. Thus, strategies could be carried out at different levels, where the DAG is a highly relevant approach. Moreover, currently DAGs can be used even for effect modification analysis. Consequently, the utilization of DAGs should be considered in the development of observational studies.

**BIBLIOGRAPHY**


**Conflict of interest.** The authors have no conflict of interest to declare.