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Opinion Article

Types of outcomes in research: what is their importance?

Types of outcomes in research: what is their importance?

José Francisco dos Santos[1], Renata Sena dos Santos[1], Antônio Marcos Andrade da Costa[1,2].

1. Faculdade do Centro Oeste Paulista, Bauru, SP, Brazil.
2. Centro Universitário Social da Bahia, Salvador, BA, Brazil.

Currently, in the field of sports science, we are increasingly experiencing the transition from a decision-making model based on isolated expert opinions to an evidence-based decision model. This process demands that professionals have the skills and competence to carry out a systematic critical assessment of the available scientific information, before applying an intervention. Evidence-based practice is a strategy aimed at improving the quality of care for clients or patients. This approach involves the definition of a problem, the search and critical evaluation of the available scientific evidence, the application of that evidence in clinical practice and finally the quantitative and or qualitative evaluation of the results [1].

The cornerstone for building a good evidence-based practice lies in formulating an appropriate research question, as it enhances the recovery of evidence and directs the scope of research, avoiding unnecessary search efforts. According to Richardson and Murphy [2], the acronym called P.I.C.O, the search strategy should be incorporated as a way to facilitate the construction of a clear and objective question, where the (P) is the characteristics of the participants, (I) is an intervention or indicator from which the evidence is wanted, (C) the usual control or condition to be compared and (O) is the outcome or outcome expected as a result. Within this process, an obstacle to the elaboration of a good investigation question is precisely the definition of that last item, the outcome. The choice of the outcome should always be aligned with the research question, and the hypothesis to be tested.

The outcomes or endpoints are variables that must be monitored during the execution of a scientific experiment, in order to assess the impact of an intervention or exposure on a given population [3]. In general, outcomes can be presented in different ways:

- Dichotomous (eg male or female);
- Continuous (eg triglyceride values);
- Ordinal (eg functional classification of heart failure);
- Temporal (eg survival curve)

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Correspondence: Antônio Marcos Andrade da Costa, Av. Oceânica, 2717 - Ondina, Salvador - BA, 40170-010.
antoniomarcoshand@gmail.com

Given the variety of types of outcomes and their remarkable relevance for obtaining an adequate answer to the research question, it is necessary to know their classifications, applications and limitations in the context of decision-making.

The outcomes can be classified according to their relevance within the research as primary and secondary. Primary outcomes should be designed with the main condition of interest being to obtain a direct benefit to the client or patient (for example, improved quality of life, reduced mortality, increased strength). Secondary outcomes, on the other hand, are additional results that should only serve to strengthen the interpretation of the results found in primary outcomes or may also serve as generators of hypotheses.

The outcomes can also be categorized as to their subjectivity of measurement as "subjective outcomes" or soft endpoints, which are those where the interpretation of the result is dependent on the expertise of the evaluator, and therefore more subject to verification bias (for example, examination resonance imaging). End the outcomes we call objectives or hard endpoints, as is the case of "death from all causes", which has little or no scope for subjectivity in its measurement, so that, its interpretation is less susceptible to distortions due to measurements misleading. Thus, whenever possible we should use them in our praxis [4].

Some outcomes can also be differentiated as to the relevance of their application in the population, such as clinical outcomes that are the result of variables whose value translates into immediate benefit to the client or patient (for example, reduction in the number of infarctions or mortality), which should be privileged whenever possible. And what we call surrogate endpoints, which are usually continuous variables, such as laboratory tests, tests of physiological variables or results of biomechanical analyzes, which occur before the clinical outcome [4]. Therefore, its use should be limited, in most cases, to raising mechanistic hypotheses regarding the clinical outcome, which should be tested in a pragmatic way in the future.

The Surrogate endpoints have fundamental value in phases I and II of studies involving human beings, especially when the potential benefits and safety of a new intervention are being considered [4]. However, we suggest caution when considering this type of result as evidence for decision-making to replace the clinical result, since the human organism is complex, composed of multiple systems that interact with each other, at all times, often causing us to establish a direct association between the surrogate result and the clinical one in a hasty manner, which can lead us to a false interpretation of the effectiveness.

In synthesis, whenever possible, we should prefer objective outcomes that assess clinical benefits focused on the client or patient, such as maximum strength gain, mortality, and fatal events such as heart attacks, rather than outcomes that assess laboratory changes such as elevated blood glucose, cholesterol, or electroneuromyographic activation. Of course, this is just an initial provocation on the topic, but it allows us to open a discussion that can, with the maturation of ideas, provide subsidies to improve the quality of care in our interventions.

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