

State of the Art: Making the Research Gap Explicit in the Background of Research Articles

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The background section of a research article should do more than introduce a health problem, describe its magnitude [1-5], and cite previous studies [6-10]. Its ultimate purpose is to establish a clear rationale for why the present study needs to be conducted. One important element for achieving this purpose is the state of the art [11-15], which should generally be presented toward the end of the background, particularly in original research articles. The state of the art describes the current position of scientific knowledge concerning the topic being investigated. It should demonstrate what is already known, what has been investigated by previous researchers, what findings have been established, and, importantly, what remains uncertain, insufficiently explored, inconsistent, or unresolved. In this sense, the state of the art is not simply a list or summary of previous publications. It is a concise synthesis of the existing body of evidence that positions the present study within the current development of knowledge [16-20].

The state of the art also serves as a bridge between the general problem described at the beginning of the background and the specific research question addressed by the study. Without this bridge, a background may contain numerous references and extensive descriptions of a health problem but still fail to answer a fundamental question: Why is this particular study necessary? A well-developed state of the art allows readers to understand the scientific landscape before the present study is introduced. It enables the researcher to show whether previous studies have produced consistent findings, whether evidence remains limited to particular populations or settings, whether methodological limitations remain, whether findings from other regions can reasonably be applied to the study population, or whether an important relationship, intervention, or phenomenon has not yet been adequately examined. Thus, the state of the art establishes the intellectual context in which the research question becomes meaningful [21].

A strong state of the art should naturally lead to the identification of the research gap [22-25]. The research gap is the specific deficiency in existing knowledge that the present study intends to address [26-32]. The gap may take different forms. Previous studies may have been conducted in other countries but rarely in the researcher's setting; evidence may exist but remain inconsistent; a particular population may have received little attention; previous studies may have used different methodological approaches; or an important variable or relationship may not have been adequately investigated. The state of the art therefore answers the question, "Where does current knowledge stand?", whereas the research gap answers, "What is still missing?" The research objective then answers the next question: "What will this study do to address what is missing?" When these three elements are connected logically, the background becomes a coherent scientific argument rather than merely a collection of information.

The placement of the state of the art toward the end of the background is particularly useful because it allows the narrative to move progressively from broad context to specific justification. The background may begin by establishing the importance and magnitude of the health problem, followed by relevant epidemiological evidence and findings from previous studies. The discussion can then become increasingly specific until it reaches the current state of knowledge. At this point, the researcher can identify what remains unknown or insufficiently understood and explain how the present study is intended to contribute to resolving that deficiency. The final part of the background can then introduce the research objective or question. This creates a logical sequence: health problem → existing evidence → current knowledge → research gap → purpose of the present study.

Health Notions encourages authors of original research articles to make the state of the art explicit near the end of the background section. This recommendation is not intended to impose an additional formal subsection or to require authors to use the exact expression "state of the art." Rather, it encourages authors to ensure that the final part of the background clearly communicates the current scientific position and explains how the proposed study emerges from that position. Authors should avoid ending the background abruptly after describing the health problem or simply stating that "therefore, this study was conducted." Such a transition may leave readers uncertain about what previous research has already established and what genuinely new contribution the present study is expected to make. Instead, authors should synthesize the most relevant previous evidence, identify its limitations or unresolved issues, and explicitly position their study as a response to those limitations.

Including a clear state of the art is particularly important because the scientific value of an original research article depends not only on the quality of its data and statistical analysis but also on the novelty and relevance of the knowledge it contributes. A study may be conducted carefully and produce statistically significant findings, yet its scientific contribution may remain unclear if the authors do not demonstrate how the findings extend, challenge, refine, or complement existing knowledge. Conversely, a relatively focused study can have substantial scientific value when its rationale is clearly connected to an important gap in the literature. The state of the art therefore helps reviewers and readers assess the originality, relevance, and necessity of the research before they even reach the Methods and Results sections.

Authors should consequently regard the state of the art not as a decorative addition to the background, nor merely as a requirement imposed by journal editors, but as an essential component of scientific reasoning. A well-written state of the art tells readers what science currently knows, what science does not yet know sufficiently, and why the present investigation deserves to be undertaken. For original research articles, Health Notions strongly encourages authors to end the background with a clear statement of the current state of knowledge, followed by the specific research gap and the contribution expected from the present study. Such a practice will make research articles more coherent, transparent, and persuasive, while helping readers recognize precisely where the new study stands in relation to the knowledge that has already been established.

In conclusion, the state of the art is an essential element of the background of an original research article because it establishes the position of the proposed study within the existing body of scientific knowledge. A well-presented state of the art enables readers to understand not only what is already known about a health problem, but also what remains uncertain, insufficiently investigated, inconsistent, or unresolved. By placing this synthesis near the end of the background, authors can create a logical transition from the general health problem to the existing evidence, the research gap, and finally the purpose of the present study. Health Notions therefore encourages authors of research articles to explicitly present the state of the art toward the end of the background and to connect it directly with the research gap and study objective. Such a practice

strengthens the scientific rationale of the manuscript, makes its novelty and contribution more transparent, and helps readers and reviewers understand why the research is necessary. Ultimately, a background section should not merely convince readers that a health problem exists; it should convincingly demonstrate what science currently knows, what remains to be known, and how the present study contributes to advancing that knowledge.

Ethical consideration, competing interest and source of funding

-Although this editorial did not require formal ethical approval, all ethical principles were consistently upheld.

-There is no conflict of interest related to this publication.

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