

# An Overview of Empiricism and Its Contribution to Nursing Epistemology

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**Abstract:** The purpose of this article is to provide an overview of empiricism and its contribution to nursing epistemology. It describes the key philosophical assumptions and discusses the major tenets of this school of thought. Finally, it highlights the role of empiricism to the development of nursing epistemology and presents the benefits and limitations of the research, as chosen from this philosophical orientation.

**Methods:** This is an opinion article that discusses the authors' opinion regarding the importance of empiricism to nursing practice and how it contributed to nursing epistemology.

**Results:** In nursing, the development of nursing knowledge through empiricism approach is deemed appropriate because the nature of the nursing practice requires predictions and explanations; empiricism has the capacity for explanation, which is necessary for clinical practice. Through empiricism, the human phenomena related to normal and abnormal physiological or psychological processes can be objectively identified and observed.

**Conclusions:** The nursing knowledge yielded through an empirical approach is considered fit for generalization based on an explanation of similar phenomena. Since the role of values as claimed by this approach tends to be 'value free', the nursing knowledge yielded from empiricism is considered valid, reliable, and objective. This makes the nursing practice evidence based.

**Keywords:** philosophy, empiricism, nurses, knowledge.

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## I. INTRODUCTION

Empiricism is one of the philosophical schools of thought that have contributed to epistemology. It is defined as the philosophy that claims knowledge stems entirely from sensory experiences [11]. The focus of this article is to provide an overview of empiricism. It will mainly describe the key philosophical assumptions and discuss the major tenets of this school of thought. It will also discuss the epistemological assumptions of empiricism and identify the source of knowledge for this approach. Finally, it will describe its contribution to nursing epistemology and present the benefits and limitations of the research, as chosen from this philosophical orientation.

## II. METHODS

This is an opinion article that discusses the authors' opinion regarding the importance of empiricism to nursing practice and how it contributed to nursing epistemology.

## III. MAJOR ASSUMPTIONS OF EMPIRICISM

### A. Predictability vs. Universality:

There are three major philosophical assumptions underlying empiricism: predictability vs. universality, knowledge development or knowledge to improve nursing practice, and analysis and synthesis [12]. The first assumption states that a

degree of predictability exists in the physical, psychological, and behavioral phenomena that make up the world; however, empiricism acknowledges that total predictability is not realistic. There are responses to the phenomena that cannot be fully understood and all the complexities of the phenomena can never be completely captured [12]. Therefore, empiricism, like any other scientific approach, does not seek to understand all the complexities of phenomena but rather to further the understanding of those phenomena to obtain a wider view of the various aspects that might shape it, as well as the factors that may influence its impact, its perception, and its occurrence [12].

### ***B. Knowledge Development:***

The second assumption is about knowledge development or knowledge to improve the nursing practice. According to empiricism, scientists must be committed to generating knowledge that helps explain the different responses that occur in the world, as well as to predict the effectiveness of various interventions. In the nursing practice, nursing science is committed to generating appropriate knowledge that helps explain the human responses associated with health and recovery, as well as predict the effectiveness of various nursing interventions to achieve health-related goals. According to empiricism, explanations and predications are seen as important to maintaining credibility in the nursing discipline [12]. Empiricism claims that understanding the phenomena does not only occur through an explanation of the phenomena, but also through the meticulous descriptions of those phenomena, to help generate information for further exploration and testing [12].

### ***C. Analysis and Synthesis***

The last assumption is about analysis and synthesis, or understanding the entirety of the phenomena. Based on this assumption, the phenomena must be analyzed and synthesized to understand fully the elements of that phenomena, the relationships among these elements, and to understand the meanings created by the synergism among those elements related to the phenomena. In light of this assumption, understanding the whole picture of the phenomena is important so the synergism among its elements can create a new meaning [12].

## **IV. TENETS OF EMPIRICISM**

Two major tenets of empiricism serve as the foundation of empirical thoughts. These are deductive reasoning and the substantiation of theoretical claims [12].

### ***A. Deductive Reasoning:***

Empiricism proposed an (hypothetic–deductive) approach to generate empirical data [12]. According to empiricism, inductive inference is insufficient to support claims of knowledge and; therefore, empiricism is substituted in the deduction process that begins with a theory and from which a hypothesis is deduced. A deductive approach rests on falsifying the hypothesis rather than confirming or supporting a theory from one or two tests [8]. Empiricism claims the theory that withstands repeated tests and that has not been falsified after many repeated tests can be regarded as valid knowledge [12]. Deductive reasoning helps facilitate objectivity because the phenomena are experimentally tested and therefore, it is not subjected to bias. Objectivity remains an important emphasis in this approach [7], and scientific reasoning must be free from bias.

Deductive reasoning is theory-driven and the theoretical model is considered the core of this approach. It serves as a system of inference, which has specific concepts reflecting the ideas that are essential to understanding the phenomena [12]. Theories synthesize a body of hypotheses that help to clarify the relationships among the concepts. Its purposes are not only to provide a complete picture of the phenomena but also to simplify and organize complicated bodies of information [12]. There are two types of theoretical models: deterministic and probabilistic. Deterministic models suggest that initial sets of conditions at one point in time determine completely the outcomes of the phenomena at other times. Probabilistic models, on the other hand, propose that initial factors determine the probabilities only of different possible responses later [12].

### ***B. Substantiation of a Theoretical Claim:***

The second major tenet of empiricism is the substantiation of a theoretical claim, which suggests there is no theoretical claim that can ever be proven true and all claims about the phenomena are merely plausible. Theoretical claims must be subjected to testing to establish the ‘real knowledge’ in the claims [11]. This involves the formulation of logical and specific operations to

test the theory. The performed operations are needed to render the hypotheses observable [12]. Observation is considered the fundamental cornerstone of substantiation. For the hypotheses to be observable, they must be translated to concrete feelings, thoughts, and behaviors so they can be measured. Based on this tenet, observations implicate the senses so what is perceived through experience is the source of all knowledge and; therefore, these observations must imply the ability to define and capture the aspects of experience through valid and reliable instruments to yield empirical data. Instrumentation or experimentation is considered the means through which the assertion toward knowledge is tested. The experimental approach, as an operation to test the theory, serves to observe, classify, and quantify the phenomena. This tenet suggests repeated trials are needed not only to verify factors related to the phenomena, but also to modify or add other factors to observe the effects. This tenet emphasizes knowledge cannot be accepted from one trial and the hypothesis specified must be subjected to falsification, as Popper proposed [1,8,12]. Therefore, this stance suggests experiments are seen as a means to hold or reject theories based on alternative hypotheses. If a hypothesis survives repeated trials and fails to be falsified, it could be substantiated as true or accurate knowledge [12].

### *C. Epistemological position of Empiricism:*

The epistemological position of empiricism is that, the sensory experiences provides all the source of knowledge [11]. According to John Locke (1690-1759), there are two types of experience that lead to formulating ideas in the mind: the experience of sensation and reflection. Locke claims that, the senses are affected by external physical objects which lead to the creation of ideas. Through reflection, the individuals examine the operations of their minds and experience processes of thinking, doubting, reasoning, knowing, and perceiving [11]. Locke also suggests that the experience derived from sensation or reflection generates simple ideas that are passively received by the mind and formulate the original foundation for knowledge. Those simple ideas can be joined, contrasted, and compared actively in the mind by varieties of criteria to construct complex ideas [11]. David Hume (1740-1797) further expanded Locke's views and suggested that all perceptions of the mind resolve in two forms: impressions and ideas [11]. Hume distinguished with this view between sensing process and thinking and claimed that impressions are derived from the experience (sensing) and result from the perceptions. To Hume, sensing and thinking produce ideas. Hume also distinguished between three types of reason; knowledge, proofs and probabilities and he claimed that all reasoning about cause and effects are derived from custom. Based on Hume, precise standards determine quantity relations without any possibility of error [11]. These two empiricists emphasized on the external, physical world as an object of knowledge, the role of senses in acquiring this knowledge, and the importance of knowledge consistency with physical reality. These emphasises had a profound impact on science development [11].

In addition, this school of thought claims that, experimentation and testing theories are key methods of generating empirical knowledge [8]. Testing theories is the basic idea behind Poppers' claims of how science works. Popper argued that the science proceeds inductively as claimed by the logical positivists. Therefore, he attempted to resolve the induction problem by making two claims. The first claim is that knowledge is not gained through passive observations but through engaging in the observations from a theoretical position [1]. Second, knowledge is conjectural and science progresses through a series of conjectures [8] and attempted refutations [4]. According to Popper, scientific knowledge is composed of theories that imply conjectures. These conjectures can be subjected to falsification [1,6]. Popper claims that from theoretical observations, incomplete conjectures may arise that require conjectural explanations. Theories and hypotheses are developed to fill the gaps in these conjectures and then trial solutions are put [1,8]. The hypothesis is then rigorously tested and an attempt must be made to falsify the theory. Repeated tests must be undertaken to test the hypothesis to falsify it. If it has been falsified, it will clarify that one possible solution did not work to solve the problem; therefore, scientists will refine, build on the hypothesis, and continue to falsify it. If the hypothesis survived repeated tests and is not falsified, new conjectures will be added to the theoretical framework and regarded as valid or true knowledge [1]. This is known as the 'hypothetic-deductive method,' which involves different steps: putting forward a hypothesis as an initially uncorroborated conjecture [4]. deducing a consequence from the hypothesis, and, through experimentation and observation, comparing its prediction with the observation to determine whether it stands up to the test. If the test proves negative, the theory is experimentally falsified and an alternative will be suggested. Repeated tests will be conducted to test the hypothesis and if the test fits the theory, the knowledge will be upheld as undefeated conjecture, but not as proven truth [4]. To Popper, it cannot be concluded that theories are true; other methods must be attempted to falsify them with new predictions. If the theory seems never to be

falsified, it has now survived, but scientists will never stop trying to falsify it [5]. Popper claimed that no general theory can be proven; rather, it can be disproved through testing, and observations that cannot be falsified cannot be tested and therefore, they cannot be counted as scientific [10]. Popper believed that scientific testing and falsification differentiate science from non-science or pseudo-science [1].

Empiricism relies on the (hypothetic–deductive) approach to gain knowledge. Deductive reasoning facilitates objectivity because this approach encourages the examination and testing of phenomena depending on a theory and a hypothesis that clarify the relationship among the concepts of the phenomena. Objectivity remains a special emphasis of this school of thought and the replicated finding is probably true [7]. Therefore, the knowledge yielded from this approach is recognized as free from bias [12]. and is considered reliable knowledge. Quantitative research is fueled by this school of thought.

## V. BENEFITS AND LIMITATIONS OF EMPIRICISM

The main strength of the empirical approach is it emphasizes the role of evidences and experiences as important methods of justifying the claims of knowledge [12]. According to empiricism, experiences can demonstrate whether a phenomenon repeats itself and abides by laws, or whether it happened randomly, which is based on it being considered a good foundation for uncovering facts [2]. Empiricism seeks scientific ways to support the claims of knowledge [12]. This approach can link facts together and using experiments; it tests through observations whether the assumptions about the knowledge are true. Moreover, empiricism is used in science as a method that helps prove and disprove theories through empirical testing and suggesting falsified hypotheses with an inquiry aim to explain, predict, and control the phenomena [7]. Because empiricism relies on experimentation, rigorously testing the knowledge, and seeking to falsify a hypothesis to establish a true knowledge [13], this approach is considered a useful and reliable method to justify knowledge claims. In addition, the hypothetic–deductive approach, which is theory-driven, facilitates objectivity and suggests there is no intrusion of bias [6,12,13]. Therefore, the results yielded from this approach are considered reliable. Based on this approach, the observations are seen as ‘value free.’ In empiricism, values are excluded and seen as confounding variables that have no roles in a putatively objective inquiry [12]. This adds another value to empiricism.

## VI. CONTRIBUTION OF EMPIRICISM TO NURSING EPISTEMOLOGY

In nursing, the development of nursing knowledge through this approach is deemed appropriate because the nature of the nursing practice requires predictions and explanations; empiricism has the capacity for explanation, which is necessary for clinical practice [6]. Furthermore, the clinical practice has become more scientific and dependent on technology to identify complex patient statuses, which often requires prolonged observations and assessments due to the complexities. These complexities, which are confronted by the practitioners, require scientific and clinical judgments that are analytical and empirical. Empiricism provides hypothetical counterarguments to support or weaken the practice and provide scientific explanations to support decision-making [6]. Moreover, this approach forces the researcher’s precision, caution, and skepticism about the outcome [6,13]. In addition, some observable human phenomena (vital signs, radiographic findings) must be linked with unobservable phenomena (psychological processes) to suggest causal factors and to identify the relationship among these factors. Through empiricism, the human phenomena related to normal and abnormal physiological or psychological processes can be objectively identified and observed. Therefore, the nursing knowledge yielded through an empirical approach is considered fit for generalization based on an explanation of similar phenomena [6]. Since the role of values as claimed by this approach tends to be ‘value free’, the nursing knowledge yielded from empiricism is considered valid, reliable, and objective. This makes the nursing practice evidence based.

An example of nursing research fit to be studied quantitatively while relying on an empirical approach is ‘The impact of Sickle Cell Disease (SCD) on Health-related Quality of Life (HRQoL) of children with SCD. This research aims to identify the impact of SCD on different outcomes of health, including the physical, psychological, social, and cognitive effects. A quantitative approach is deemed appropriate because it facilitates the identification of the relationship between the disease (SCD) and the health outcomes (HRQoL) using objective and reliable tools. This topic is guided by a pre-identified

conceptual model for HRQoL that was developed and tested earlier in the literature. From this conceptual model, a hypothesis can be deduced (The more frequent the pain crises in SCD children, the poorer the HRQoL identified.) This hypothesis is subjected to falsification. This approach will provide a better explanation of various factors that could affect SCD children's HRQoL, and it will link observable and unobservable factors. The tool that will be used is valid and reliable so the results that will be obtained are objective and unbiased. Furthermore, this approach facilitates recruiting a large sample and; therefore, the generalization of the findings on a similar population is possible. In addition, this study might suggest a novel strategy to improve HRQoL; novelty is another feature obtained by utilizing a quantitative design. It is a powerful design and attracts funding [13]. The limitation of empiricism is that it neglects the 'whole' person by studying only specific parts of a human. Sensory data captures only some parts of human experience and some elements of human existence such as dignity, grief and hope cannot be seen or touched and; therefore, it cannot be empirically tested. Another problem with empiricism is that it might not be possible for nurses to eliminate personal experience and subjectivity from the perceived experience [11]. Furthermore, it does not make explicit how the views of patients are drawn into the research process. Moreover, the claimed knowledge represents probabilities about human phenomena instead of universal laws [9]. Knowledge may also be affected by external factors, and some experiments can yield different results under certain conditions [2]. In addition, the development of the theory is controlled by others who are outside the discipline [13].

## VII. CONCLUSION

This article discussed empiricism as an important school of thought that has contributed to epistemology. Experimentation and focusing on falsification is the methodology suggested by this approach, with an inquiry aim to explain, predict, and control. The nature of knowledge according to this school of thought is that non-falsified hypotheses are considered probable facts. The quality criterion for such an approach is a conventional benchmark for rigor; therefore, the yielded knowledge is considered valid, reliable, and objective; making the nursing knowledge evidence based. The role of values as claimed by this approach tends to be 'value free,' and there is no role allowed for the values in the observations or in the objective inquiry. The knowledge accretion from empiricism adds to the knowledge of the cause-effective linkages, as well as to generalizing findings [7].

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