



# Does Ophthalmology Need Philosophy?

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## Abstract

Although ophthalmology has made significant progress and awareness about eye care and the accessibility of health technology has increased, there are still aspects that might be improved. One of the ways to achieve improvement is philosophical investigation of some reasoning and behavior styles in ophthalmology. Philosophy means love of wisdom, and the philosophical approach can contribute to increasing the wisdom of ophthalmologists. Logical fallacies currently affecting the decisions of ophthalmologists can be reduced. "ontology" can contribute to a better understanding of "the nature of reality". A detailed inquiry about the basic concepts concerning ophthalmology may support better reasoning styles. Reflecting on epistemological questions such as "What is true knowledge?", justifying information, and having a skeptical attitude may help to make decisions with more accurate information. The philosophy of science is concerned with the detailed investigation, questioning, and understanding of ophthalmologists' scientific activities and may form the missing link between ophthalmology and philosophy. Moreover, the claim that philosophy's contribution to science is of no interest to scientists warrants consideration. The philosophers of science Karl Popper and Thomas Kuhn have made significant contributions to the perception of science that are still valid today. Karl Popper proposed that a demarcation between science and pseudo-science might be made through the concept of "falsification". According to this concept, a statement is scientific if it can be tested and falsified using valid methods. Thomas Kuhn stated that major scientific changes (i.e., revolutions) occur through paradigm shifts. Although the areas of moral philosophy/ethics/bioethics have generated useful ideas and practices for the improvement of the art of medicine, bioethics in particular deserves to be questioned philosophically by physicians living in real life. Ophthalmologists can develop more beneficial and realistic ophthalmology education, research, diagnosis, treatment, and rehabilitation practices by utilizing the basic methods of philosophy.

**Keywords:** Philosophy, ophthalmology, wisdom, philosophy of science, moral philosophy

## Introduction

Ophthalmology has shown significant progress and achievements, particularly in the last 20 to 30 years. Surgical incisions are made on a micron scale, and drugs that act against pathological vascularization are providing more "successful" results in incurable diseases. Societal awareness of eye health has increased, and technological products for diagnosis and treatment have become widespread and more accessible. Thus, in many parts of the world, ophthalmology utilizes these advanced

capabilities to reduce vision loss and improve people's quality of life.

Although science in general and ophthalmology in particular have made major progress, when examined objectively, one can recognize aspects of both that can be improved.<sup>1,2,3,4,5</sup> One means of improving these aspects is a philosophical approach that subjects some established thoughts and behaviors to more rigorous examination and inquiry.<sup>6,7,8,9,10,11,12</sup> Philosophy is not an "ivory tower" activity that quotes important philosophers, deals only with the theoretical realm, and is carried out

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with complex words. Although unnoticed, philosophy is an activity that positively or negatively affects life in many ways and determines the basic mental processes that guide life. Ophthalmology practices, like all activities of life, are shaped by some fundamental philosophical approaches.

This article provides an introduction to philosophy and the areas in which philosophy and ophthalmology interact. Philosophy in Turkish means “love of wisdom,” and we will discuss the connection and relationship between ophthalmology and philosophy based on the premise that the main purpose of philosophy is to “acquire wisdom.” We use the concept of “wisdom” within the scope and historical meaning of the Turkish language, not implying a “mystical” wisdom of Far East or similar origin. We use a plain language, avoiding expressions and terms that are not used by people outside the field of academic philosophy, such as “geist,” “phenomenology,” and “transcendental.” This article will attempt to raise the call to carefully reexamine ophthalmology, which has historical ties and interaction with philosophy, within the conditions of our language (Turkish) and country.

## Philosophy

As is widely known, “philosophy” is formed from the words *philo* and *sophia* and means “love of wisdom.” In the Turkish language, the concept of wisdom (*bilgelik*) is based on the root for “know” (*bil-*) and has a common origin with words such as knowledge (*bilgi*), science (*bilim*), scientific (*bilimsel*), and consciousness (*bilinç*). “Know” (*bil-*) in our language is also used in the sense of “having the power, skill, and ability to do” in the Turkish words for “able to do” (*yapa-bilmek*), “able to see” (*görebilmek*), and “able to know” (*bile-bilmek*). Considering the dictionary definitions, “wise” (*bilge*) can be defined as a person who has comprehensive knowledge and can use their knowledge correctly and beneficially, and “wisdom” can be defined as the state of evaluating what transpires with a superiority born of virtue and knowledge. Essentially, wisdom can be described as “to comprehensively know and be aware; to implement in a correct, beneficial, and virtuous way.”

## Logic and Fallacies

Logic is among the essentials of philosophy and works on the principles of correct reasoning. Logic defines the methods and rules by which experienced realities and mental processes can be conveyed through words (or symbols) in a way that other minds can understand and process. Although there are different definitions, in our opinion, logic structurally examines the processes involved in using words (and symbols) connected to thoughts to enable realities to be conveyed in accordance with actuality.

The most important logic topic that concerns ophthalmologists is logical fallacies. Logical fallacies are erroneous thought processes that occur unconsciously. Although ophthalmology is largely carried out through rigorous cognitive processes, logical fallacies can mislead patients and

ophthalmologists just as everyone else. Publications on logical fallacies and how to reduce them are also found in medical literature.<sup>13,14,15</sup> In this article we address several important and common fallacies concerning the field of ophthalmology.

A common fallacy in life and ophthalmology is called *post hoc ergo propter hoc* in Latin, or the “post hoc fallacy” for short.<sup>16</sup> This fallacy can be described as the assumption that unrelated events are connected because they occur in temporal proximity (one after the other). It manifests as an erroneous causal relationship drawn between events with very low or no probability of connection. It can be regarded as essentially an extension of the problem of induction in philosophy.<sup>17</sup>

As an example related to ophthalmology, if a person with atopic tendency and complaints of intense eye itching, redness, and off-white discharge uses antibiotic drops at home, leaves the city, and then attributes the cessation of their symptoms to the antibiotic, this is an example of post hoc fallacy. Their symptoms likely resolved because they moved away from an allergen, but they think the antibiotic cured their condition. Another example is to assume that intravitreal injections alone improved or worsened a patient’s condition, without adequately considering some other important factors, such as blood glucose regulation. To believe that the intravitreal drug is definitively effective or ineffective carries the possibility of post hoc fallacy, because the presumption of (in)efficacy is being made in a multifactorial clinical condition based on only one variable, without a comprehensive evaluation of the causal relationship.

Statements such as “drug A is effective and safe in eye disease B” that bear truth/falsity and provision/judgment values are called propositions. When a phenomenon inconsistent with this proposition is observed, from a philosophical standpoint this proposition is no longer as strong as it was; in a sense, it is “refuted.” In this case, new scientific observations and studies are conducted in an attempt to gain a more comprehensive understanding of the subject of the proposition. A new study shows that drug A is more effective in patients with intraocular pressure of 20–25 mmHg. Therefore, the proposition becomes “drug A is effective and safe in eye disease B when intraocular pressure is between 20 and 25 mmHg.” Now more is known about disease B and drug A and there is more comprehensive knowledge of which patient group drug A will be effective in. The hypothetical phenomenon given here is an example of the “thought experiment” concept in philosophy. Thought experiments aim to scrutinize reality within the framework of existing information, according to reason and logic but with imaginary/hypothetical situations. This thought experiment is an example of the process of better understanding the incompletely understood disease B, creating a more correct approach, and avoiding post hoc fallacy.

Post hoc fallacy can be seen in some patients in examples such as “my head hurts, my intraocular pressure is high,” or in exfoliative zonular weakness, “surgery was performed incorrectly, my lens shifted.” Headache may be associated with intraocular pressure in a group of patients; however,

if intraocular pressure is implicated when the headache was actually caused by a factor such as tension or stress, then a post hoc fallacy was committed. Similarly, a patient with advanced exfoliation who undergoes normal cataract surgery and later attributes intraocular lens dislocation due to severe zonular weakness as “incorrect surgery” is another example of post hoc fallacy. The capsule is no longer adequately supported due to structural alterations in the patient’s eye, yet the patient believes the surgery was performed incorrectly.

The problem with the post hoc fallacy is that it is difficult to determine whether successive events are truly connected, i.e., to determine causality. Even randomized controlled studies cannot fully solve this problem; the complexity of the human organism makes it difficult to reach the truth.<sup>18,19</sup> “Confounding” and “bias,” which exist in medicine and the nature of life, also create challenges in identifying causal relationships. Although this logical fallacy can be overcome to some extent through more careful observations and interpretations based on a better scientific method, it is an important problem of science and philosophy that has yet to be solved.<sup>17</sup> Ophthalmologists can reduce the frequency of post hoc fallacy by being more aware of the fact that successive events can also occur by chance.

Apart from the post hoc fallacy, some habits in the medical field may also lead to erroneous thinking and decision-making by physicians.<sup>13</sup> The habits of appealing to authority and appealing to convention are also common fallacies. These are examples of logical fallacies in that well-known people may not always show the right path, or the majority may be misguided.<sup>20,21,22,23</sup> In the case of ophthalmology, it should also be borne in mind that despite being published in reputable journals, study results may be biased due to factors such as academic or financial concerns. Using publications with a high citation index and a practical orientation, as well as checking the accuracy of information related to the physicians’ workplace, hospital conditions, and patient group may help prevent these logical fallacies.<sup>21,22,23,24,25</sup>

Varner<sup>25</sup> reported that there are problems in the ophthalmology literature regarding issues such as study validity and bias, patient selection and eligibility, compliance with standards of comparison, insufficient patient numbers, lack of comparison to the gold standard or placebo, confounders, and a lack of clear research objectives.

An important part of logic studies is the branch of propositional logic. When many statements used in ophthalmology are examined within the framework of propositional logic, one can gain a more in-depth perspective in the diagnosis, treatment, and follow-up stages. For example, the expression “this person has glaucoma” is perceived as a true, clear, and understandable proposition by ophthalmologists. However, ophthalmologists being acquainted with subjects like whether a judgment is accepted as “true” because it is “concordant with the facts” or because it is “consistent with all other propositions of the system to which that proposition belongs” may contribute to more solid foundations of ophthalmological knowledge.<sup>26</sup>

## Ontology: The Philosophy of Being/Existence

One means by which physicians can achieve wisdom is to scrutinize basic definitions and concepts that influence their thinking and practices, such as “disease,” “health,” “therapy,” “healing,” “innovation,” or “the latest treatment.” Although this area is considered to be related to the branch of ontology, which is translated into Turkish as “the philosophy of existence,” it also falls into the domain of epistemology and aims to provide a better understanding of the nature of reality. The reason ontology concerns ophthalmologists is that basic definitions and concepts influence their ways of thinking that lead practices in that field of knowledge. For example, the phrase “complete well-being” in the World Health Organization’s definition of health indicates a very high level of well-being and creates a goal that is difficult to achieve in real life.

Another example of the importance of definitions and concepts for physicians and patients is statements such as “the latest treatment” or “innovation.”<sup>27</sup> While such words can be presented as a hope and cure for the patient, they also carry meanings such as “treatment whose effects and side effects are not yet fully known.” Ontology examines words’ mental correlates in real life, thereby enriching perceptions and understanding of the subject and contributing to wisdom. Although philosophy scholars and philosophers examine such basic concepts in theoretical terms, physicians can make more realistic contributions to these examinations and explanations from real life.

## Epistemology: The Philosophy of Knowledge

Along with ontology, another important branch of philosophy is epistemology, or the philosophy of knowledge. Epistemology is defined as “a general reckoning with knowledge,” and it leads philosophical discussions such as “the nature of knowledge and justification” and “the position/attitude of skepticism.”<sup>28</sup> Knowledge is defined as “justified true belief,” and valid and adequate indications that a proposition is true are accepted as evidence.

Epistemology is a branch of philosophy that adopts a measured skepticism and seeks answers to questions such as “What is true knowledge?”, “What factors make knowledge true?”, and “Is the information given by people known as authorities always reliable?” Epistemology is one of the most fundamental areas of philosophy and deals with the “having true and comprehensive knowledge” aspect of wisdom. Seeking an answer to the question “Does industry funding influence research results?” is in fact an epistemological pursuit. A more detailed form of epistemology is the philosophy of science, which subjects scientific thought and practices to philosophical scrutiny and inquiry.

## Ophthalmology and the Philosophy of Science

Ophthalmology, which is actually a branch of science, is most connected to philosophy through the philosophy of science. The

philosophy of science is concerned with more closely examining, questioning, and understanding the procedures and processes called “scientific activity.” It has been stated that in traditional education, there is a “missing link” between science and philosophy and that philosophy’s contribution to science is of no interest whatsoever to scientists.<sup>29</sup>

Philosophy of science aims to contribute to many questions such as “What is science and its purpose?”, “What properties distinguish scientific knowledge from other types of knowledge?”, “What is scientific explanation?”, and “Under what conditions is science useful?” Ophthalmologists can examine and review their activities as science practitioners within the framework of the philosophy of science. This examination and review process may allow ophthalmology practices to further mature and be more open to development.

Although many scientists and philosophers have contributed to the philosophy of science, Karl Popper and Thomas Kuhn in particular made significant changes in perspectives of science, the impact of which persist even today.<sup>30</sup> Therefore, we will briefly discuss some ideas of these two science philosophers.

Popper<sup>31</sup> made the concept of “falsifiability” central to science. According to this idea, the distinction between scientific and non-scientific information is whether it can be falsified. Information that cannot be tested experimentally and falsified by the scientific method is not considered scientific, but is relegated to the realm of pseudoscience.<sup>31</sup> Karl Popper’s concept of falsifiability, which promotes scientific skepticism, also offers ophthalmologists an important approach and useful research style. According to this research style, if ophthalmology knowledge and practices can be falsified by an experiment or observation, that knowledge and practice is scientific. For example, the proposition that “elevated intraocular pressure damages the optic nerve” is considered scientific because it can be confirmed or shown to be false by experiment or observation. It is observed that people with glaucomatous damage have high intraocular pressure, and it is understood that intraocular pressure damages the optic nerve. However, as time progresses and observations increase, the observation of a person with glaucomatous damage who does not have high intraocular pressure indicates a fault in the proposition “high intraocular pressure damages the optic nerve” and it becomes clear that another explanation for glaucomatous damage is needed. Thus, the explanation of low tension glaucoma emerges and glaucoma is better understood.

An important point learned from Popper is that findings contrary to established knowledge and general belief should not be disregarded, because they will contribute to a better understanding of medical truths. Applying the falsifiability principle in daily life exposes the errors and fallacies of general beliefs and thoughts and allows them to be corrected and strengthened. Without a skeptical approach based on the falsifiability principle, ophthalmologists would probably still be diagnosing and monitoring glaucoma with Schiøtz tonometry. Demonstrating the shortcomings of this device enabled follow-up and treatment to be performed using better methods. When

current methods are also shown to be flawed, it will immediately open the way for more useful diagnostic and therapeutic methods for nearly all eye diseases. By means of the falsifiability principle, findings that falsify established practices are given more attention, theories and explanations are closer to the truth, and practices are improved.

The scientific philosopher Kuhn<sup>32</sup> introduced the concept of “paradigm shift,” which explains how scientific revolutions, or major changes in scientific understanding, have occurred throughout history. This explanation rejects the view that science is an activity that evolves and is perfected by the gradual accumulation of knowledge over time. According to Kuhn, people in a profession group, with the influence of their professional perspectives, develop scientific propositions (i.e., “paradigms”) that explain events within a certain framework. Although these scientific propositions do not always reflect the most accurate and truthful information, those within the group perceive them as true knowledge. Over time, however, new findings reveal important flaws in the existing paradigm, and a new paradigm is developed to explain the situation. An example of paradigm shift in ophthalmology is the transition from explaining glaucomatous damage by the mechanical effect of intraocular pressure to the explanation of vascular autoregulation, and even the transition to considering it an eye disease related to systemic neurodegeneration.<sup>33</sup>

The concept of paradigm shift draws attention to the fact that established ideas are understood and explained with the existing level of knowledge and that these truths can change with new information. Instead of assuming medical findings that contradict the general view are errors or inadequate observations, seeing them as an opportunity to improve the general view can initiate large-scale changes. In terms of ophthalmology, Kuhn’s major contribution is that existing knowledge is considered “valid according to the present understanding” and that more comprehensive understanding and perceptions of reality can be achieved through new findings and new perceptions. From Kuhn’s perspective, the attitude that will further advance ophthalmology is not research that replicates and confirms established knowledge, but adopting an approach that encourages development and change by demonstrating deficiencies in the current understanding.

Popper and Kuhn have made some important contributions to the perceptions and application of science and the scientific method. In our opinion, the most important contributions of these two science philosophers are that they draw attention to the need for existing knowledge to nearly always be open to inquiry and even challenge. Ophthalmologists may be inclined to consider findings that are inconsistent with general knowledge and understanding as incomplete or inaccurate observations. Ophthalmology journals, like all journals, can fall prey to publication (or non-publication) bias, particularly toward articles stating that drugs and treatments are not effective.<sup>25,34,35</sup> Publication bias in the field ophthalmology can be observed as a higher publication rate of studies with positive results, i.e., showing that there are benefits of treatment, especially in

journals with a high impact factor.<sup>35</sup> This suggests that studies showing that drugs and treatments are ineffective are less likely to be published, especially in high-impact journals.

In addition, misconduct by those regarded as authority is met by silence due to the culture of respect for elders in the profession, which has persisted from the Hippocratic Oath to the present day. Although it is important to preserve ophthalmological traditions, which are an extension of our country's culture, measured and logical objections to established inadequate practices can help ophthalmology advance in the right direction.

An important feature of science and ophthalmology is the different approaches to science in countries or institutions that “produce knowledge” and those that “use knowledge.” Although the scientific method has the same standards, there may be differences among individuals and institutions that produce scientific knowledge and those who transfer and use it. The people, institutions, and countries that produce knowledge “promote” the scientific product with the inherent aim of ultimately profiting from it. For this promotion, inadequacies and flaws of a method may be overlooked while so-called “scientific” methods are used to convince others of its superiority. So-called “scientific” studies can also be seen in research and knowledge-generation processes for reasons such as academic promotion, recognition, and industry affiliations.<sup>20,36</sup> By seeking answers to questions such as “What are its inadequacies and advantages?” and “Does it contribute significantly to clinical practice?”, the users of scientific information and technological products can more accurately evaluate scientific products. This way of thinking contributes to a more comprehensive understanding of reality and wisdom through questions like “What is true knowledge?” and “Who benefits from this information?”, which are actually among the fundamental questions of epistemology.

### Moral Philosophy/Ethics/Bioethics

The area of greatest interaction between philosophy and medicine is the field of deontology/ethics/moral philosophy. Changes in the last few decades have resulted in a silent shift from the concept of “deontology” to the concept of “ethics” in medical education and practice. As ethics, derived from “ethos,” is perceived as an area that more encompasses professional rules, we prefer the more comprehensive term “moral philosophy” in this article. Moral philosophy is the field of philosophy that discusses the morality of thoughts and behaviors through questions such as “What is the right behavior?”, “What is virtuous behavior?”, and “What makes a behavior moral?”

In addition to big problems in the field of academic philosophy such as “Can there be moral standards other than religious edicts?”, moral philosophy can also be used for other everyday life problems. Frank discussions of questions such as “What boundaries make industrial relationships with physicians moral?”, “Is it morally appropriate to present a medical practice as a new treatment while in the research stage?”, and “Can a

revenue/performance-based pricing system negatively affect the principle of doing no harm?” are also included in the field of moral philosophy. In addition, the philosophical and moral examination of the concepts of health law cited in malpractice claims such as “failure to inform,” “strict liability,” and “professional inexperience” also warrants philosophical inquiry in terms of expressing the physician's viewpoint.

It has been stated that for the art of medicine to be performed with decency, it must be determined not only by technical rules but also by medical ethics, and many criticisms of medicine arise from the patient feeling that they have been subjected to excessive and unnecessary interventions.<sup>37</sup> Excessive medicalization has been called a real danger in many countries due to situations that can be described as the abuse of drugs and medicine.<sup>38</sup> Biomedical ethics is also expected to answer the questions of what to do, what not to do, and how to solve problems encountered while conducting research or practicing the profession.<sup>39</sup> Moreover, it becomes a moral imperative to test practices that are currently being presented as scientific, such as leeching, ozone therapy, homeopathy, and acupuncture, according to real scientific standards, and only allow practices that are not of “pseudoscience” status. Such trials by philosophical inquiry contribute to a deeper understanding of medical practices and the enhancement of their morality.

The field of medical ethics has been shaped by the concept of “bioethics” since the 1970s, largely due to the contributions of philosophy and medical history scholars.<sup>40</sup> Bioethics is a theoretical field of study that has contributed significantly to the strengthening of human rights in the field of medicine and health and to making medical practices more humane. Today, bioethical principles are used as a moral norm/standard in a wide range of areas, from health law to medical research. The Turkish Ophthalmological Association adopts the Professional Ethics Guide for Ophthalmologists: Ethical Principles and Professional Principles and determines the ethical principles of ophthalmological activities in our country.<sup>41</sup> In addition, the Turkish Medical Association Professional Ethics Code is shaped by the four principles of bioethics.<sup>42</sup>

While some additions may be made, the core bioethical principles of beneficence, non-maleficence, justice, and autonomy have remained strong over the years. In fact, although ophthalmologists may not realize it, a significant proportion of everyday practices are shaped by these four principles of bioethics. For example, practices such as informed consent are carried out within the scope of the bioethical principles of patients being autonomous/self-governing and the procedure being beneficial for the patient. Although such bioethical practices create some difficulties for physicians and health institutions, they ensure the implementation of many practices that are for the patient's benefit.

While bioethics has made significant contributions to more humane medical practices, this field must also be subjected to philosophical inquiry by physicians, i.e., by those who apply these principles in practice. When the literature is examined, there are many articles that regard bioethical principles positively,

as well as criticisms that these principles reflect the traditions of Western moral philosophy, politics, and social theory and are even a tool of moral imperialism.<sup>43,44</sup> Taking into account these and similar criticisms, the field of bioethics is due for a philosophical examination using the questioning tools of moral philosophy.

Ophthalmologists, as people who are living and observing in real life, can make important contributions to the theoretical field of bioethics. Some moral standards developed at an office desk may not be compatible with the realities of daily life. Some well-intentioned theoretical practices can turn into impositions that strain the human dignity of physicians. Under the guise of actualizing bioethical norms, physicians may be exposed to practices outside the norms of human rights. Ophthalmologists should also try to utilize philosophical inquiry for support in the scientific and moral criticism of the legal norms associated with bioethical principles and to avoid being subject to undignified allegations of malpractice.

## Conclusion

Science and philosophy had nearly the same meaning historically but have been divergent for several centuries, and today the connections between science and philosophy are rather obscure. For thousands of years, philosophy has involved thinking and producing written works on various subjects, whereas science has used mental abilities to innovate practices to make life better. Over time, the ties between science and philosophy have weakened; philosophy remained purely a field of intellectual production, while science continued on to become a field of intensive technology production and use, but limited in terms of inquiry.

Even if ophthalmologists are not interested in philosophy, just asking the question “Is it possible that what is said may be untrue?” will constitute the first stage of wisdom. Philosophy can contribute to an ophthalmology practice that is firmly grounded and consistent with how physicians want themselves and their families treated, not swayed by the researchers, authors, and opinion leaders (although rare) who abuse the drug industry’s support. For such medical practices, there may be important benefits to revisiting and reconstructing both the “logos” and “ethos” areas of ophthalmology (i.e., ophthalmologos).

A philosophical attitude that pursues wisdom makes an important contribution to more accurately observing, thinking about, and interpreting one’s experiences. This may enable a more comprehensive and sound evaluation of professional practices. The essence of the professional activity performed can be better recognized and understood. Philosophy provides individuals and the profession with valuable intellectual abilities and tools applicable in a broad range of contexts, from advancing ophthalmology research to defending against malpractice claims. For these reasons, ophthalmologists need philosophical activity and the wisdom they can gain from it.

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