International Journal of Unani & Traditional Medicine
Published by FHT • ISSN: 3048-9482

Review Article

Revisiting Ibn Rushd's *Kitāb al-Kulliyyāt fī al-Ṭibb*: Philosophical Foundations and Contemporary Relevance for Unani Medicine

Mohammad Abul Mufazzal[1]*, Mohammed Yasir[2]
[1]*Jawaharlal Nehru University (JNU), New Delhi, India*
[2]*Dr. M.Ishaq Jamkhanawala Unani Medical College, Mumbai*

KEYWORDS:
Ibn Rushd
Kitāb al-Kulliyyāt fī al-Ṭibb
Unani medicine
Humoral theory
Mizāj (temperament)
Traditional Philosophy
Integrative medicine

ABSTRACT

This article revisits Ibn Rushd's seminal medical treatise, Kitāb al-Kulliyyāt fī al-Ṭibb, exploring its philosophical foundations, humoral theory, and enduring relevance to contemporary Unani medicine. Written in 12th-century Andalusia, the Kulliyyāt articulates medicine as an applied science rooted in Aristotelian epistemology, balancing theoretical knowledge with practical healing. Ibn Rushd's seven-part classification of medical knowledge—spanning anatomy, physiology, pathology, diagnostics, pharmacology, preventive care, and therapeutics—reflects a systematic and holistic approach that prefigures modern integrative medicine. Central to his framework is the doctrine of humors and mizāj (temperament), which he presents as dynamic, individualized determinants of health. The article examines how Ibn Rushd's emphasis on equilibrium, lifestyle factors, and treatment by contraries aligns with contemporary models of personalized and preventive care. It also highlights his methodological synthesis of empirical observation and rational analysis, anticipating principles of evidence-based medicine and clinical reasoning under uncertainty. By situating al-Kulliyyāt within both its historical context and modern discourse, the study underscores Ibn Rushd's role in shaping a rational, ethical, and patient-centered medical tradition. His insights offer valuable perspectives for Unani practitioners and medical educators seeking to integrate classical wisdom with modern clinical standards.

1. Introduction

Abū al-Walīd Muḥammad ibn Aḥmad ibn Rushd (1126–1198 CE), widely known in the Latin West as Averroes, occupies a central place in the intellectual history of medieval Islam. A jurist, philosopher, and physician, Ibn Rushd's scholarly range encompassed law, theology, philosophy, astronomy, and medicine (Gutas, 2001). He is remembered not only for his extensive commentaries on Aristotle, which profoundly influenced scholastic thought in Europe, but also for his contributions to medical theory, particularly his synthesis of Greco-Islamic medicine with Andalusian intellectual traditions (Arnaldez, 1998). Among his medical writings, *Kitāb al-Kulliyyāt fī al-Ṭibb* ("The Book of Generalities on Medicine"), translated into Latin as the *Colliget*, represents his most systematic articulation of the principles of medicine. Written around 1162 CE, this work was conceived as a theoretical compendium (*kulliyyāt*, i.e., "generalities") intended to complement more practically oriented treatises, notably *al-Taysīr fī al-Mudāwāt wa-l-Tadbīr* ("Book of Simplification") by his friend and contemporary Abū Marwān ibn Zuhr (Avenzoar). The deliberate pairing of these two texts, Ibn Rushd's *Kulliyyāt* covering general principles and Ibn Zuhr's *Taysīr* focusing on clinical specifics, illustrates Ibn Rushd's conviction that medicine requires both universal theoretical foundations and concrete applications in practice (Pormann & Savage-Smith, 2007). Indeed, the title *al-Kulliyyāt* ("Generalities") was explicitly chosen in contrast to Ibn Zuhr's *al-Juz'iyyāt* ("Particulars"),

* *Corresponding author. Jawaharlal Nehru University (JNU), New Delhi, India*
Email: khanmufazzal@gmail.com

underlining a collaborative vision in which theory and practice are united.

Composed at a time when the synthesis of Greek, Islamic, and local Andalusian medical knowledge had matured, the *Kulliyyāt* reflects Ibn Rushd's Aristotelian commitment to order and classification. Building on the works of Hippocrates, Galen, and Ibn Sīnā (Avicenna), Ibn Rushd defines medicine (*ṭibb*) as an applied science that is distinct from, yet dependent upon, natural science (*ʿilm al-ṭabīʿah*) for its general principles (Ullmann, 1970).

The influence of Ibn Rushd's *Kulliyyāt* was not confined to the Islamic world. The work was translated into Latin by the 13th or 14th century and became widely known in Europe as the *Colliget*. For several centuries, it served as a medical textbook at European universities, being cited and taught well into the Renaissance (Fakhry, 2001; Tbakhi & Amr, 2008). The *Colliget*'s structured overview of medicine provided a convenient summary of Galenic medicine and was often studied alongside Avicenna's *Canon of Medicine*. Notably, the Spanish-Arabic origin of the text and its Aristotelian rigor made it an object of interest to scholastics seeking to reconcile classical knowledge with medical practice in medieval Europe (Arnaldez, 1998). Ibn Rushd himself made original contributions to medicine, he wrote treatises on topics like tremor and paralysis, correctly identified the retina as the seat of vision (departing from the classical view that the lens was primary), and described clinical cases resembling stroke and Parkinson's disease (Tbakhi & Amr, 2008). These insights underscore that while *al-Kulliyyāt* was a compilation of *kulliyāt* or general principles, Ibn Rushd was also an observer and innovator on specific medical questions of his time.

2. The Preface: Medicine as an Applied Science

In the Preface (*Muqaddimah*) to *al-Kulliyyāt*, Ibn Rushd defines medicine (*ṭibb*) as a *ṣināʿah fāʿilah*, an operative or applied discipline, whose aim is "to preserve health (*ṣiḥḥah*) when present and to restore it when lost." This dual function highlights both the preventive and curative dimensions of medicine, situating it firmly within the practical sciences (Arnaldez, 1998). By characterizing medicine as an "applied science," Ibn Rushd underscores that medical knowledge is not pursued for its own sake (as in pure theoretical science), but for the sake of action, specifically, the action of healing and maintaining well-being. This view mirrors an Aristotelian philosophical framework: in Aristotle's classification, theoretical sciences seek knowledge for truth, whereas practical sciences (like ethics or politics) and productive sciences (like engineering or crafts) seek knowledge for the sake of action or production. Ibn Rushd explicitly places medicine in this scheme as akin to a practical science oriented toward human well-being (Gutas, 2001), much as ethics aims at the good life. In doing so, he both affirms medicine's dependence on theoretical knowledge of nature and insists on its autonomy as a craft that must adapt to particular circumstances of patients.

Ibn Rushd's Preface makes an instructive analogy between medicine and other skill-based disciplines such as navigation and military strategy. Navigation relies on astronomical and geographical knowledge but also on the pilot's experiential judgment amid changing winds and currents; strategy draws on principles of tactics and logistics but must be adjusted by the commander in the unpredictability of battle. Similarly, medicine must not only rest upon general theoretical principles (*qawāʿid*) derived from natural science, but also be applied with prudence (*ḥikmah*) and contextual judgment in real cases. Ibn Rushd criticizes those who confine themselves to theory without practice as well as those who rely only on trial-and-error without understanding general principles. For him, the ideal physician unites both approaches: *ṭibb* is at once scientific and practical, requiring *ilm* (knowledge of causes) and *amal* (skill in application). This stance was a continuation of a long tradition in Islamic medicine: earlier physicians like al-Rāzī (Rhazes) and Ibn Sīnā had also emphasized the interplay of theory and practice, with Ibn Sīnā defining medicine as "the science by which we learn the various states of the human body when in health and when not in health, with the aim of preserving health and restoring it" (Avicenna, as cited in Ullmann, 1970). Ibn Rushd echoes this but goes further in explicitly framing it as an *applied* science anchored in Aristotelian epistemology. To provide structure to the domain of medicine, Ibn Rushd outlines seven divisions of medical knowledge in his Preface. These seven parts are: (1) Chapter on *Tashrīḥ al-Aʿḍāʾ:* the study of organs (anatomy of simple and compound organs), including humors (*akhlāṭ*) and pneumas (*arwāḥ*); (2) Chapter on *Al-Ṣiḥḥat:* the study of health (*ṣiḥḥah*), its types and causes (physiology); (3) Chapter on *Al-Maraḍ:* the study of disease (*maraḍ*), its types, causes, and manifestations (pathology); (4) Chapter on *Al-ʿAlāmāt:* the study of signs of health and disease (Wellness Markers and clinical diagnosis or symptomatology); (5) Chapter on *Al-Adwiyah wal-Aghdhiyah:* the study of the tools of health and disease, including drugs (*adwiyah*) and nutrition (*aghdhiyah*) (pharmacology and dietetics); (6) Chapter on *Ḥifẓ al-Ṣiḥḥa:* the study of measures and regimens for maintenance of health (preventive medicine); and (7) Chapter on *Shifāʾ al-Amrāḍ:* the study of therapeutic interventions or treatments (curative medicine). This sevenfold classification reflects Ibn Rushd's systematizing spirit and his Aristotelian love of order. It essentially covers the entire spectrum of medical science as known in the 12th century, and in modern terms it maps onto the major medical disciplines: anatomy, physiology, pathology, symptomatology, pharmacology (and nutrition), preventive medicine, and curative medicine (Figure. 1). By explicitly enumerating these categories, Ibn Rushd was following the precedent of Galen and later Islamic physicians in organizing medical knowledge into a coherent curriculum. For instance, the comprehensive Canon of Avicenna was structured into books on similar topics (anatomy, hygiene, pathology, pharmacology, etc.), though Avicenna divided material into five books rather than seven. Ibn Rushd's schema can be seen as an attempt to clarify and perhaps streamline the pedagogical organization of medicine (Pormann & Savage-Smith, 2007). It indicates an educational intent: the *Kulliyyāt* was meant to be a foundational textbook that trainees could study to grasp the "universals" of medicine before moving on to case-based practice and manuals of specifics like Ibn Zuhr's work.

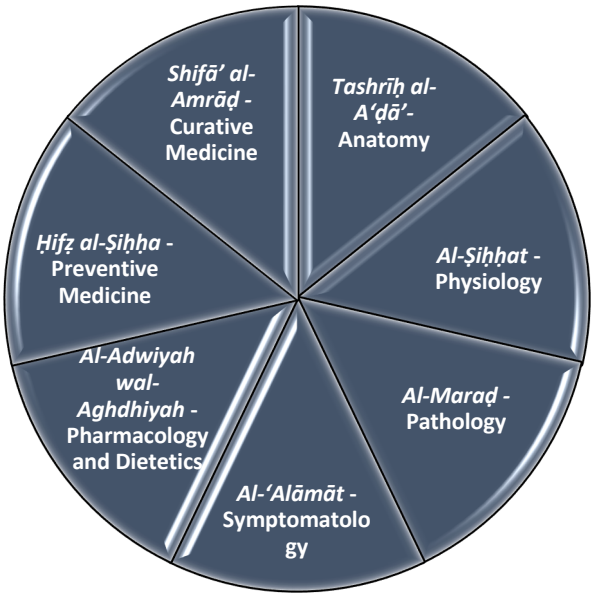

Figure. 1: Ibn Rushd's Seven-Part Classification and Modern Equivalents

Medicine, in Ibn Rushd's conception, thus stands as a holistic and integrative discipline. The Preface effectively serves as a manifesto for a *kullī* (universal) view of medicine that is comprehensive and unified. It argues that just as a navigator must understand stars and winds, a physician must be versed in principles of anatomy, physiology, and theory, but at the same time, like a seasoned sailor, the physician must respond to the unique "weather" of each patient's condition with experience and sound judgment. This view prefigures modern calls for holistic and integrative medicine. Contemporary medicine, after a long period of specialization and reductionism, has seen a resurgence of interest in treating the patient "as a whole" and emphasizing preventive care. Ibn Rushd's insistence on including diet, lifestyle, and prevention as equal parts of the medical curriculum resonates with current models of healthcare that stress lifestyle medicine and preventive strategies alongside curative interventions (Gutas, 2001).

Historically, the classification of medicine as an applied science also had to do with asserting the legitimacy and status of medicine. By grounding medicine in natural science, Ibn Rushd placed it on a firm philosophical foundation, countering any notion that healing was merely a craft or trade devoid of intellectual rigor. Yet by highlighting its applied nature, he defended the autonomy of medical practice against overly theoretical scholars who might criticize physicians for not adhering strictly to philosophical doctrine in the face of practical exigencies. This balance of theory and practice championed by Ibn Rushd became influential in medical education. The *Colliget* in Latin Europe was used to teach the general principles, while other texts and apprenticeships covered practical aspects. Through the centuries, this integrated approach would slowly give way to increasing specialization. However, the pendulum in the 21st century is swinging back: modern medical curricula incorporate ethics, communication, public health, and clinical experience from early on, reflecting an understanding that good medicine is both science and art. In this light, Ibn Rushd's Preface reads as surprisingly modern, advocating a well-rounded physician who is at once a scientist, a philosopher, and a skilled craftsman of healing.

3. Medicine and Natural Science

Ibn Rushd's definition of medicine as an applied science raises the question of its relationship to other disciplines, particularly the theoretical science of nature. He notes in *al-Kulliyyāt* that medicine "borrows principles" from *ʿilm al-ṭabīʿah* (natural science or physics), yet remains distinct in its orientation and purpose. The natural scientist (*ṣāḥib al-ʿilm al-ṭabīʿī*) may study the human body and its illnesses abstractly as natural phenomena, but the physician (*ṭabīb*) studies them with a view to action, namely prevention and treatment (Arnaldez, 1998). This distinction aligns with the Aristotelian division between theoretical knowledge (*episteme*) and practical knowledge (*phronesis* or applied techne).

In the Islamic scholarly tradition, this positioning was significant. Early classifications of the sciences by thinkers like al-Fārābī and Ibn Sīnā included medicine often as one of the branches of natural science or as a craft allied to natural science. Ibn Sīnā in his *Aqsām al-ʿUlūm* (Categories of Sciences) lists medicine under the physical sciences but acknowledges its practical aspect (Ullmann, 1970). Ibn Rushd is more explicit in giving medicine a dual identity. He even likens medicine to ethics in *al-Kulliyyāt*: as ethics is to the philosopher, a practical science aimed at the good life, so is medicine to the physician, a practical science aimed at health (Gutas, 2001). This analogy underscores the noble status he assigns to medicine; it's not just a trade like carpentry, but a discipline requiring wisdom (*hikmah*) and concern for human welfare (indeed, the very term for medicine, *ṭibb*, is often associated with kindness and benevolence in Arabic).

The dependence of medicine on natural science in Ibn Rushd's view meant that a physician should be educated in the fundamentals of anatomy, physiology, and even elements of physics and chemistry as understood in his time. He was aware that certain general principles, such as the Four Elements (earth, water, air, fire) and their qualities (hot, cold, moist, dry), or basic anatomical structures, come from natural philosophy. In *al-Kulliyyāt*, for example, he invokes elemental theory to explain human temperaments and the workings of drugs (each humor or drug has a quality that can be described in those elemental terms). This "borrowing" from natural science is necessary to ground medical reasoning: without understanding what blood or bile is, or how the liver functions as an organ, the physician's interventions would be blind. However, Ibn Rushd is careful to point out that the natural scientist's inquiry stops short of the physician's interest. A physicist (in the ancient sense) might explain that phlegm increases in winter because of cold and moisture in the environment, a natural phenomenon, but only the physician will ask how to manage a phlegmatic imbalance in a patient and what regimen could counteract it.

This distinction reflects Ibn Rushd's broader Aristotelian background and perhaps a subtle critique of philosophers who meddled too far into medicine and of physicians who pretended that medicine could be entirely derived from philosophical theory. For Ibn Rushd, medicine's orientation (*wijha*) is toward action and particular cases, whereas natural science's orientation is toward truth and universals. In modern terms, we might say he differentiates between basic science and applied science or between bench research and clinical practice. A parallel can be drawn to today's separation of fields: for example, biology and physiology discover mechanisms, while medicine and clinical sciences apply those findings to treat patients. Ibn Rushd's perspective resonates with the concept of translational research, moving from *bench to bedside*, acknowledging that while the bench (the lab, theoretical knowledge) provides critical insights, the bedside (clinical context) has its own demands and constraints.

Unani medicine, the tradition that evolved from Greco-Islamic medicine and to which Ibn Rushd contributed, continues this concept by distinguishing *ilmu'l-tabīʿah* (the knowledge of nature, including anatomy and physiology) from *ilmu'l-ṭibb* in practice. Contemporary Unani scholars note that foundational principles are drawn from understanding nature (e.g., the humors as bodily natural constituents), but the hakīm (Unani practitioner) applies them in individualized treatment (Pormann & Savage-Smith, 2007). The World Health Organization, in its modern review of traditional medicines, echoes that systems like Unani are "holistic medical systems" that view the human body as a single unit integrated with nature (Yuan et al., 2016). This holism is inherent in Ibn Rushd's conception of medicine's place: since medicine straddles natural science and practical ethics, it inherently treats the person as both a biological organism and a subject of care.

From a historical perspective, Ibn Rushd's emphasis on medicine's practical orientation was also a defense of medical knowledge against speculative overreach. In the medieval context, some thinkers influenced by Neoplatonism or mysticism might have tried to attribute disease to purely spiritual or supernatural causes, bypassing natural explanations. By rooting medicine in natural science, Ibn Rushd (like Hippocrates before him) upheld a rational, non-superstitious understanding of disease. At the same time, by asserting medicine's independent goal, he warned against a pure theorist's approach that might neglect the *art* of healing. This balance helped solidify the intellectual respectability of medicine in the Islamic world. It was seen neither as mere empiricism nor as armchair theory, but as a disciplined craft informed by science.

In modern philosophy of medicine, there is ongoing debate about the extent to which medicine is reducible to biology (the "biomedical model") versus the extent to which it must include humanistic, ethical, and social dimensions. Ibn Rushd's framing essentially prefigures this debate: he would likely assert that medicine cannot be wholly reduced to biology (natural science) because it must concern itself with the patient's well-being in context, which includes judgment calls, values (ethics), and individualized factors. This is analogous to contemporary arguments for a "biopsychosocial model" or for integrative medicine that combines technical science with holistic care. In the Stanford *Encyclopedia of Philosophy*, biomedicine is described as embracing reductionism and focusing on purely biological causes of disease, often to the exclusion of other factors (Krieger, 2011, as cited in Andersen, 2023). Traditional systems like Unani, Ayurveda, or Traditional Chinese Medicine, by contrast, inherently include environment, lifestyle, and even emotional factors in their understanding of health, a viewpoint that modern medicine is rediscovering in fields like preventive medicine and psychosomatic medicine. Ibn Rushd's insistence on the *orientation* of the physician being toward action and outcomes can thus be seen as an early statement of what we might call *clinical pragmatism*.

4. Humoral Theory and *Mizāj*

A central element of Ibn Rushd's medical discourse in *al-Kulliyyāt* is the classical doctrine of the four humors (*akhlāṭ*) and the concept of temperament or constitution (*mizāj*). While Ibn Rushd's anatomical knowledge was limited by the observational tools of his era (e.g., human dissection was rudimentary), his treatment of humoral theory is extensive and has had enduring influence in Unani medicine. Drawing on the legacy of Hippocrates and Galen, as transmitted and elaborated by earlier Islamic physicians like al-Rāzī and Ibn Sīnā, Ibn Rushd affirms that the human body contains four primary humors: blood (*dam*), phlegm (*balgham*), yellow bile (*ṣafrā'*), and black bile (*sawdā'*) (Ullmann, 1970). Health (*ṣiḥḥah*) is defined as the state of *iʿtidāl* (equilibrium or balance) among these humors in both quantity and quality, while disease (*maraḍ*) arises from *ikhtilāl* (imbalance or disturbance) in their proportion or mixture. Each humor is associated with specific qualities: blood is hot and moist (sanguine), phlegm is cold and moist, yellow bile is hot and dry (choleric), and black bile is cold and dry (melancholic). These correspondences reflect the cosmological linkage of humors to the four Empedoclean elements (air, water, fire, earth) and seasons (spring, winter, summer, autumn), a grand schema whereby the microcosm of the body mirrors the macrocosm of nature (Lagay, 2002).

Ibn Rushd's exposition of humors in *al-Kulliyyāt* largely follows Galenic tradition, but with clarification and organization characteristic of his Aristotelian bent. He explains not only what the humors are, but also their role as intermediate agents of physiology and pathology. The humors are the basic fluids that "make up the constitution and cause its pains and health," as the Hippocratic dictum goes. They are formed from digested foods and distributed to organs, nourishing them and enabling bodily functions. Each person is born with a particular *mizāj* (temperament). Ibn Rushd, like Galen, connects these physical temperaments to psychological character, noting that the humoral balance influences both body and soul. This is evident in everyday language (even today we describe someone as "phlegmatic" or "choleric" to indicate personality traits, a linguistic legacy of humoral theory).

Crucially, *mizāj* in Unani medicine is not a static concept but a dynamic one. It represents an individual's normative equilibrium. Ibn Rushd underscores that every person has a unique, inherent temperament that is "most appropriate for him, endowed by nature for the sake of his function". A balanced or moderate

temperament means the humors are in ideal proportion for that individual (which can vary by age, sex, climate, etc.), whereas an imbalanced temperament predisposes to illness. He likely inherited from Galen the idea of a *crasis* or mixture that constitutes an individual's makeup. In practice, diagnosing the temperament was fundamental for a physician because it guided what was considered normal or abnormal for that patient. For instance, a person of cold-dry temperament might normally have a lower body temperature and slower metabolism; if they exhibit signs of excess coldness (beyond their usual state), that indicates an imbalance.

In therapy, humoral theory leads to the principle of treating by contraries (*al-ʿilāj bi-l-ḍidd*). Ibn Rushd discusses how dietary regimen (*tadbīr al-aghdhiya*) and pharmacological treatments must be tailored to a patient's temperament and humoral condition. A disease of excess heat and dryness (e.g., a fever with dehydration) should be treated with cooling, moistening remedies; conversely, an ailment of excess cold and moisture (e.g., phlegmatic congestion) should be managed with warming, drying interventions. This approach, deeply rooted in Hippocratic medicine, is illustrated by countless examples in Unani texts: a patient with too much phlegm (cold/moist) might be given ginger (hot/dry) to restore balance, or someone with choleric overheating (hot/dry) might be given a cooling drink of herbs. Ibn Rushd's systematic framework of causation included external causes (e.g., climate, diet) affecting the humors, internal causes (organ malfunction producing humoral excess or deficiency), and resultant symptoms when humors are out of balance. He integrated this with the concept of six essential factors (*asbab-e-sittah zaruriyyah*), air, food/drink, sleep/wake, motion/rest, excretion/retention, and emotions, which in Unani theory influence the humors and thereby health (Ahmad et al., 2022). Although *al-Kulliyyāt* itself may not enumerate the six factors in detail, Ibn Rushd's discussion of prevention touches on managing these lifestyle variables to keep the humors in check (WHO, 2010).

The enduring nature of humoral theory in Unani medicine up to today cannot be overstated. While biomedical science in the 19th and 20th centuries discarded the literal notion of the four humors as fluids in the body, Unani practitioners have often reinterpreted them in more functional terms (Jamil et al., 2010). Many contemporary Unani scholars argue that the concept of humoral balance can be seen as a precursor to homeostasis and bodily equilibrium (Nirmal et al., 2020). For example, blood as "hot and moist" corresponds to a state of warmth and nourishment (perhaps analogous to metabolic and hormonal activity), whereas phlegm as "cold and moist" might be likened to functions of cooling and lubrication (one could draw a parallel to the parasympathetic nervous system or to certain anabolic processes). Some attempts have been made to correlate humoral imbalances with biochemical or immunological profiles, e.g., viewing a phlegmatic imbalance as corresponding to excess mucus and maybe high leukocyte counts in certain infections, or a bilious temperament with high bilirubin or liver overactivity (though such correlations remain speculative). The language of humors thus functions metaphorically for systemic states. In modern Unani clinical practice, a physician might explain to a patient that their "dominant humor" is producing certain symptoms and advise dietary changes to counter that, effectively a way to instill moderate lifestyle changes (balance of work and rest, hot and cold foods, etc.), which often aligns with sound health advice even if the theoretical rationale differs from modern physiology.

It is also instructive to compare humoral theory with analogous concepts in other traditional systems. Ayurveda, the classical medicine of India, posits the theory of three *doshas* (Vata, Pitta, Kapha) which strongly resembles humorism. *Pitta* corresponds to hot, bilious qualities (like *ṣafrā'*); *Kapha* corresponds to phlegmatic, cold-moist qualities; and *Vata* (wind) has no direct analog in the four humors but embodies movement, dryness, and cold. Health in Ayurveda is similarly a state of equilibrium of the *doshas*, and personal constitution (*prakriti*) is key (Patwardhan et al., 2005). Traditional Chinese Medicine (TCM), while structured differently (with its theories of Yin-Yang and Five Elements), also emphasizes a balance of fundamental forces and fluids (such as Qi, Blood, and Moisture) and attributes hot/cold or damp/dry qualities to illnesses and herbs. The parallels suggest a convergent understanding across cultures: the idea that wellness is a dynamic balance and illness a perturbation of that balance due to internal or external factors. Ibn Rushd's insistence on treating the imbalance (not just the symptom) aligns with the holistic orientation of these traditional systems. In all these philosophies, treatment often involves *opposing* the quality of the disease (e.g., cooling fevers, warming chills), which is a logical strategy that even modern medicine employs in certain ways (cooling therapies for hyperthermia, hydration for dehydration, etc.).

However, from the perspective of modern biomedicine, humoral theory in its original form is obsolete. It provides no accurate map of anatomy (blood and bile are real fluids, but "phlegm" and "black bile" as systemic entities are not), and it lacks a mechanistic explanation for disease that can be empirically verified. The humoral model was largely superseded between the 17th and 19th centuries by discoveries in anatomy, circulation (Harvey's work), pathology (Morgagni, Virchow), and ultimately microbiology (Pasteur, Koch). The decline of humorism in the West is often marked by the rise of germ theory and cellular pathology in the 19th century, which demonstrated that diseases have specific etiologies (bacteria, lesions, biochemical disruptions) rather than being due to generalized imbalance of fluids (Encyclopedia.com, n.d.).

Yet, it's worth noting that some principles of humoral theory were indirectly vindicated by modern science in a different guise. The focus on diet, exercise, sleep, and emotional balance, all central to maintaining humoral equilibrium, is validated by modern epidemiology showing these factors are critical to preventing lifestyle diseases. The idea of patient-specific treatment (temperament-based) prefigures personalized medicine, which today looks at genetic and metabolic individuality to tailor treatments (Patwardhan, 2014). Moreover, the holistic approach of humoral theory, considering the patient's environment and habits, resonates with contemporary integrative medicine and systems biology. Systems biology, for instance, studies the body as an integrated network of systems striving for homeostasis; this is analogous to the Unani view of *ṭabīʿat* (the body's innate self-preserving faculty) maintaining balance

among humors (Ahmad et al., 2022). Some researchers have even explored the immune system in terms of an equilibrium that could be metaphorically mapped to humors, e.g., the balance of pro-inflammatory and anti-inflammatory factors could be seen as a "hot-cold" balance in modern terms (Baker, 2018). While these analogies should not be taken too literally, they demonstrate that the humoral concept of balance still offers a language and conceptual framework that is meaningful in discussing health in an integrative context.

In Ibn Rushd's case, we should also highlight his intellectual honesty regarding humoral theory. Even as he affirms the classical doctrine, he is aware of its empirical limits. Medieval physicians, including Ibn Rushd, faced cases that did not neatly fit humoral explanations. Ibn Rushd acknowledged varying presentations and the limits of certainty, for example, recognizing that humoral etiology can be mixed and that outward signs (pulse, urine, etc.) must all be interpreted together to infer the internal humoral state. This diagnostic art was subtle and probabilistic. In a way, their diagnostic process was an early form of pattern recognition across multiple variables (pulse, urine, stool, etc.), which is not unlike the multifactorial diagnostic reasoning clinicians use now, albeit without the same theoretical backdrop.

Indeed, the World Health Organization has encouraged integration of traditional systems like Unani into public health, provided they are evidence-based and quality-controlled.

In summary, humoral theory and *mizāj* form the backbone of Ibn Rushd's medical theory in *al-Kulliyyāt*. Philosophically, it provided a unified way to understand human physiology, psychology, and pathology in one schema of balance and imbalance. Its strength lay in its holistic and individualized approach. The legacy of humoral theory, however, is far-reaching. It shaped not only Unani but also medieval European medicine (where Galenism reigned until the Enlightenment).

5. Methodology and Epistemology

Ibn Rushd was not only a physician but also one of the great Aristotelian philosophers of the medieval period. It is thus unsurprising that in *al-Kulliyyāt* he devotes attention to how medical knowledge is obtained and validated. He emphasizes that medicine derives its knowledge from two primary sources: empirical observation (*tajrībah*, i.e., experience) and rational analysis (*burhān*, demonstrative reasoning). Neither source is sufficient on its own. Empirical observation, such as observing clinical cases, noting symptoms, and testing the effects of drugs, provides the raw data of medicine and often yields useful rules of thumb, but by itself it cannot yield universal and necessary truths. Rational analysis, grounded in logic and general scientific principles, offers coherence and explanatory frameworks, but by itself it may be disconnected from reality or too general to guide specific treatments. Therefore, per Ibn Rushd, sound medical methodology *requires the combination of both*. This mirrors his approach in philosophy where he often insisted that true understanding comes from harmonizing sense experience with intelligible principles.

In the context of medieval medicine, this dual emphasis was quite pertinent. There were long-standing debates between the so-called *empiricists* and *rationalists* in ancient and medieval medicine (Porter, 1997). The empiricists claimed that experience (often the accumulated case observations or *tried remedies*) was the only trustworthy guide, while the rationalists (or dogmatists) built elaborate theories (e.g., theories about anatomy and invisible causes) to guide treatment. Ibn Rushd, following Galen's line, sought a middle ground. He quotes (or paraphrases) the famous maxim attributed to Hippocrates that "Life is short, the art is long", implying that one cannot rely on direct experience alone to learn everything, because life would end before one sees all possible cases. Thus, rational generalization is needed to extend knowledge beyond individual experiences. However, he also acknowledges that not every medical principle can be demonstrated with absolute certainty (*burhān qaṭʿī*) in the manner of a mathematical proof or a philosophical syllogism. Medicine often must operate in the realm of the probable. This notion closely anticipates what we now call *clinical reasoning under uncertainty*. Ibn Rushd writes that probabilistic knowledge, when applied systematically, is sufficient for successful therapy. This is a direct reflection of Aristotelian epistemology: in practical sciences, we often have only *ihtimāl* (conjecture) or *ẓann* (informed guess) rather than *yaqīn* (certainty), yet that is acceptable because the end is action, not absolute knowledge.

Ibn Rushd's epistemology of medicine thus foreshadows the modern concept of evidence-based medicine (EBM) in an interesting way. EBM posits a hierarchy of evidence and acknowledges that we rarely have 100% certainty; instead, we have levels of probability and confidence from clinical trials, observational studies, etc. The physician must make decisions often with incomplete information, using the best available evidence combined with clinical judgment. Ibn Rushd would likely agree, as he stresses the integration of evidence (observation) with reasoning. One could liken *tajrībah* in his context to what we might call "clinical data" or "case studies" and *burhān* to "pathophysiological reasoning" or "general scientific principles." A concrete example from *al-Kulliyyāt* is how he discusses the testing of drugs. He knew from Galen and others that one should test a drug's effect in a simple case, observe its action, but also reason about it, e.g., if a certain herb consistently cools fevers, one can rationally classify it as "cold in the second degree" in temperamental terms and then predict it will treat other hot diseases (provided those diseases share similar qualities). This is an early form of generalization from trials.

Indeed, medieval Islamic physicians formalized criteria for testing drugs empirically, a practice Ibn Rushd would have been aware of through Ibn Sīnā's Canon and other sources: the drug must be pure, tested on a single illness, tried on different patients, and so forth (Arslan, 1984). These were primitive precursors to clinical trials. Ibn Rushd's emphasis on experience implies he valued such empirical trials, but his emphasis on demonstration implies he also valued understanding the underlying cause, for instance, understanding that a drug is effective because it has a certain quality or affects a certain organ, not just because "it worked before somehow." This aligns with Galen's approach of combining *logos* (reason) and *peira* (experience). In modern terms, it's the blend of *mechanistic understanding* and *statistical evidence*.

Ibn Rushd also addresses the limits of certainty in medicine with humility. He notes that unlike mathematics or metaphysics, medicine cannot always achieve certainty because of the variability of individual bodies and the complexity of factors at play. This variability means the same intervention might yield different outcomes in different patients, which is something even modern medicine grapples with (think of how patients respond variably to the same medication). Ibn Rushd's pragmatic view was that medicine need not be certain to be useful; it is enough that it produces results most of the time. This pragmatic success criterion is reminiscent of later notions of *probabilism* in medicine, and even of the way evidence-based guidelines are framed (e.g., "this treatment is likely to benefit X% of patients"). His perspective contrasts with any idea that medicine should be purely theoretical. In a way, he was inoculating medical epistemology against both the overconfidence of dogmatists and the nihilism of skeptics.

Epistemologically, Ibn Rushd aligns with the Aristotelian idea that knowledge in practical sciences is often *contingent* and *for the most part true* rather than universally and necessarily true. We see this in his approach to prognosis: he might say "If certain signs appear, the patient *usually* recovers, but there are exceptions." This kind of reasoning appears in the Hippocratic Corpus as well and was carried through Galen. A famous example: The Hippocratic aphorism "Extremes of physique (very fat or very thin) are more prone to die early", it's a probabilistic generalization from empirical observation, which Ibn Rushd would treat as *generally reliable* but not absolute. Interestingly, he ties this probabilistic nature to the concept of *burhān* (demonstration) in a modified way, acknowledging a category of *burhān ẓannī* (probable demonstration) in medicine, distinct from the *burhān yaqīnī* (certain demonstration) of math or physics (Arnaldez, 1998). This subtle philosophical point shows his innovative attempt to broaden Aristotelian epistemology to accommodate medical science.

If we compare this to modern scientific philosophy, it is analogous to differentiating between the *hard sciences* (where controlled experiments yield repeatable results) and *clinical sciences* (where heterogeneity and context mean we rely on statistics and probabilities). Modern philosophy of science, as reflected in the work of folks like Nancy Cartwright or in the design of clinical trials, similarly grapples with the idea that what works "on average" may not work in every case, and that we seldom have universal laws in biology comparable to physics. Ibn Rushd's writing foreshadows this understanding.

Additionally, the *classification* Ibn Rushd provides of the parts of medicine (the seven divisions) is not just a pedagogical outline; it reveals epistemological concerns. Each division corresponds to a domain of inquiry with its own principles and methods (he notes that each has distinct causes and purposes). This suggests he recognized that the criteria for knowledge or evidence might differ slightly in each subfield. For example, anatomy relies more on direct observation (even dissection of animals and inference), whereas pharmacology relies on experimentation and inference of qualities, and diagnosis relies on signs and analogical reasoning. By structuring knowledge, he implicitly tells the student physician: here are the domains you must master, each with its way of knowing. In the modern era, we still see something similar, medical curricula separated into anatomy (mostly descriptive science), physiology (experimental science), pathology (analytic science connecting signs to causes), pharmacology (applied chemistry with empirical testing), etc. The unity of these disparate methodologies under the umbrella of "medicine" can be philosophically challenging, but Ibn Rushd's Aristotelian approach allowed him to see it as a coherent whole: all aimed at the end of health, all part of the *art of medicine*, but drawing on different mixtures of induction and deduction.

An interesting dimension to discuss is Ibn Rushd's commentary on previous physicians' methodologies. Prominent thinkers like Ibn Sīnā had heavily systematized Galenic medicine, sometimes with very elaborate logical and metaphysical additions. On the other side, there were simple practitioners and folk healers who might be dismissive of theory. Ibn Rushd, with his typical rationalist zeal, likely critiqued slavish adherence to authority in medicine. It is known that he wrote a now-lost book *Kashf al-Burhān* (The Demonstration of Proof) against Galen on certain points (Hamarneh, 1970). This indicates he was willing to challenge medical doctrines if they didn't meet his standard of reasoning. This critical spirit is essential to scientific progress and is something we value today, the willingness to update practice when evidence contradicts tradition. For instance, Galen had said bloodletting is useful in many situations; a critical empirical mindset eventually led doctors to see it often did more harm. Ibn Rushd didn't have the evidence to overturn bloodletting (he probably accepted it in principle), but the seeds of a more cautious, evidence-tied approach are there in his emphasis on *tajrībah*.

From a modern critical perspective, one could argue that Ibn Rushd still placed too much trust in Aristotelian physics (e.g., the four elements theory) as a basis for reasoning in medicine. This was a limitation of his time; without a better model, he rationalized within that framework. Sometimes rational analysis built on faulty premises can mislead, for example, reasoning that a certain disease must be caused by excess black bile because all symptoms appear "cold and dry" may miss the actual cause (say, a pathogen or a nutritional deficiency). This points to the importance of continually updating the rational principles with new empirical discoveries, something that started happening centuries later. Ibn Rushd's method could accommodate that, in theory, because he'd say improved *ʿilm al-ṭabīʿah* (natural science) leads to improved principles for *ṭibb*.

6. Contemporary Relevance

Why should *al-Kulliyyāt*, a text composed in 12th-century Córdoba, matter for contemporary medicine, especially the Unani tradition and the broader landscape of integrative health? Ibn Rushd's insights, when reframed in modern terms, speak to several important trends and discussions in today's healthcare.

First, Ibn Rushd's definition of medicine as an *applied science*, requiring both theoretical knowledge and practical wisdom, resonates strongly with contemporary calls for holistic and integrative medicine. In an era where high-technology interventions often dominate, there is a growing realization that medicine is not reducible to technical procedures alone; it is

fundamentally about healing people, which entails judgment, empathy, ethics, and a focus on overall well-being (Hassan, 2019). The integrative medicine movement, for instance, emphasizes treating the whole person (body, mind, and spirit), drawing on both conventional biomedical treatments and complementary therapies for a more balanced care (WHO, 2013). Ibn Rushd's view that the physician must unify scientific principles with practical judgment and ethical concern for the patient's welfare is very much in line with this. Modern definitions of integrative medicine often stress the *healing relationship* and the combination of mainstream and alternative methods for optimal health (Maizes et al., 2009). Averroes, in his time, similarly saw the physician's role as not just a technician but a wise guardian of health, akin to how a philosopher-guides society or an ethicist guides moral action. His analogies comparing medicine to navigation and governance underscore the humanistic and situational awareness needed in practice[7]. This ethos is exactly what many feel modern assembly-line medicine has lost and needs to recapture. In fact, contemporary medical curricula are increasingly incorporating training in communication, medical humanities, and ethical decision-making to produce doctors who can apply science with compassion and context, essentially echoing Ibn Rushd's integrated model (Bleakley, 2014). As one scholar puts it, "Medicine is not just about curing diseases, it is about caring for patients," and Ibn Rushd would have heartily agreed (Gutas, 2001).

Second, Ibn Rushd's emphasis on humoral balance and temperament provides a framework still central to Unani practice, and it finds surprising relevance in addressing modern lifestyle diseases. Today's world is marked by chronic, multifactorial illnesses, obesity, diabetes, hypertension, anxiety disorders, which are often related to lifestyle and require long-term management rather than one-time cures. The Unani focus on balance, regimen (*tadbīr*), and temperament offers valuable insights complementary to biomedicine (Ahmad et al., 2007). For example, the concept of a *mizāj* (temperament) that is particularly susceptible to certain diseases is analogous to the modern idea of risk factors or predispositions. Instead of humors, we might speak of metabolic syndrome or inflammatory markers, but the idea is that an individual's constitutional makeup (genetic or otherwise) combined with lifestyle will tilt them toward certain ailments. Unani physicians often prescribe lifestyle modifications, balanced diet, adequate sleep, stress reduction, exercise, tailored to a person's temperament. Far from being antiquated, this approach aligns with the preventive strategies now advocated by public health experts for combating lifestyle diseases (WHO, 2010). The holistic prescriptions of Unani (e.g., eat according to your temperament and season, maintain equilibrium in work and rest, etc.) mirror modern advice for healthy living, albeit framed in different terms. Indeed, researchers in integrative medicine sometimes recast humoral ideas in modern light: for instance, equating the concept of excess *balgham* (phlegm) with a sluggish metabolism and propensity for excess mucus or adiposity, recommending "warming" lifestyle changes such as more activity and spices in diet (Khan et al., 2017). Such parallels show that the ancient language of humors can often be mapped to present concepts of homeostasis, immunity, or endocrine balance.

Furthermore, in a period where personalized medicine is a buzzword, the tailoring of treatment to the individual characteristics of each patient, Unani's long tradition of individualized regimens based on temperament is a precursor to that mindset. The modern healthcare system, driven by biomedical research, is increasingly acknowledging that one size does not fit all (due to genetic differences, microbiome differences, etc.). Traditional systems like Unani and Ayurveda have always emphasized personalization (Patwardhan, 2014). They segment patients by broad constitutional types and adjust therapies accordingly. While the science behind their segmentation differs from genomic medicine, the practical outcome is attention to the individual, which is a common goal. In fact, there are ongoing studies attempting to correlate traditional temperamental types with genomic or biochemical profiles (e.g., do "hot" temperaments have higher basal metabolic rates or certain gene expressions?). Early results show some correspondences, though this field is nascent (Wahab et al., 2019). The implication is that Ibn Rushd's framework, if translated carefully, could enrich modern preventive medicine, for example, using Unani dietary categorization (foods labeled as hot, cold, etc.) to advise patients on diet in a way that resonates with their cultural understanding and perhaps aligns with anti-inflammatory diets in biomedicine.

Third, Ibn Rushd's methodological humility, his acknowledgment of the limits of certainty and the role of probability, anticipates debates in evidence-based medicine (EBM) and the practice of medicine under uncertainty. In the late 20th century, EBM arose emphasizing the use of population-level evidence (especially from clinical trials) in guiding care, but it was also recognized that evidence must be applied by clinicians in the context of individual patients, and that absolute certainty is rare. The probabilistic thinking that Ibn Rushd advocated (treating medicine as a science of the *most likely*, not the *universally certain*) is very much how modern clinicians approach diagnosis and prognosis (e.g., calculating a differential diagnosis with probabilities, discussing prognosis in terms of chances). He wrote that medical practice often operates in conditions of uncertainty and probability, yet can still achieve therapeutic success (Arnaldez, 1998). This statement rings true today: we often do not know exactly which treatment will work best for a given patient, we go with the treatment that has the highest probability of success as per studies, and then we monitor and adjust. Additionally, Ibn Rushd's dual emphasis on experience and reasoning can be seen in EBM's triad: best research evidence, clinical expertise (experience), and patient values. He didn't explicitly mention patient preference, but the ethical dimensions he acknowledged cover valuing the patient's subjective well-being, which is analogous. Thus, one can argue Ibn Rushd would be a supporter of combining "external evidence" with "clinical judgment," rather than an extremist on either side.

Another area of contemporary relevance is the rising interest in *systems thinking* and *network biology* in medicine. As mentioned, humoral theory conceptualizes the body as an integrated whole where local disturbances have systemic effects (through humoral imbalance). Modern systems biology similarly studies how networks of genes, proteins, and metabolites interact to maintain

balance (homeostasis) and how systemic dysregulation leads to disease. Some authors have drawn parallels between ancient concepts of "balance of humors" and the idea of maintaining internal homeostasis amid external changes (Sneha & Kalra, 2020). The terminology differs, but the conceptual metaphor is surprisingly aligned. In public health too, the idea of salutogenesis (focus on factors that support human health and well-being, rather than on factors that cause disease) resonates with the preventative, balance-maintenance aspect of Unani. For example, Unani's *Hifẓ al-Siḥḥa* (maintenance of health) principles e.g. clean air, appropriate diet, exercise, mental calm, align with modern wellness and preventive care programs. Ibn Rushd's holistic vision thus dovetails with the integrative health movement that combines conventional medicine with complementary practices (like herbal medicine, mind-body techniques, etc.) to address not just diseases but promote overall health (Bell et al., 2002). It's notable that WHO now encourages member states to integrate proven traditional remedies and practices into their health systems for a more person-centered approach (WHO, 2013). Unani medicine, as practiced in South Asia for example, has government-recognized hospitals and colleges, and many people use it for chronic ailments where lifestyle advice and gentle herbal treatments might help (Khan, 2006). The conceptual robustness of texts like *al-Kulliyyāt* provides intellectual support for such integration, showing that Unani is not a random assortment of folk practices but a system grounded in a long philosophic-scientific tradition.

Finally, there is an academic and cultural relevance to revisiting Ibn Rushd's medical work. In the broader history of science and philosophy, Ibn Rushd is celebrated for his commentaries on Aristotle in philosophy and for his impact on European thought (the Latin Averroists, etc.). However, his role as a physician and medical author is less well known outside specialized circles. Re-examining *al-Kulliyyāt* in light of contemporary issues highlights a more complete image of Ibn Rushd, that of a polymath who sought unity of knowledge. It also serves as a reminder of the rich medical heritage outside the commonly taught Western canon. With the modern shift towards global health perspectives and appreciation of traditional knowledge, Ibn Rushd's *Kulliyyāt* stands as a bridge between ancient Greek medicine and today's integrative medicine. It is a historical example of cross-cultural fertilization (Greek, Islamic, local Andalusian) that can inspire current efforts at integrating diverse medical knowledge systems in the service of global health.

Some remedies and practices originating from the Unani tradition (to which Ibn Rushd contributed theoretically) are gaining attention for integration into comprehensive care, for example, the use of certain herbal formulations for metabolic health or massage and hammam (bathing) practices for musculoskeletal conditions. Investigating these with modern science could expand our therapeutic toolkit.

In a world facing challenges like chronic disease epidemics, antibiotic resistance, and mental health crises, the call for more comprehensive, person-centered care is loud. Ibn Rushd's work cannot provide direct solutions to these modern problems, but it offers a philosophical underpinning for why a broadened approach to medicine (one that values balance, prevention, and ethical practice) is important. It also provides historical context that the dichotomy between "traditional" and "modern" medicine is not absolute, the two can be, and historically have been, part of a continuum of evolving medical knowledge.

7. Conclusion

Ibn Rushd's *Kitāb al-Kulliyyāt fī al-Ṭibb* represents a remarkable synthesis of Aristotelian philosophy, Galenic medicine, and Islamic intellectual tradition. While its specific anatomical and physiological descriptions are bound by the limits of medieval knowledge, its conceptual framework remains profound and thought-provoking. By defining medicine as an applied science oriented toward health, integrating humoral theory and temperament into a cohesive model of human functioning, and emphasizing a methodology that unites empirical observation with rational analysis, Ibn Rushd articulated a vision of medicine that endures in the Unani practice to this day. His insistence on clarity of terms, logical classification of topics, and acknowledgement of uncertainty anticipates many concerns of modern medical science and education.

Across the centuries, Ibn Rushd's voice speaks to the idea that medicine is far more than a collection of treatments: it is a way of thinking about human life in equilibrium with nature. In an age of high-tech medicine, this perspective is a valuable corrective. It urges us not to lose sight of the *kulliyyāt*, the generalities, the big picture, amidst the *juz'iyyāt*, the particulars and details of specialization. The preservation of health (a focus of wellness medicine today) and the care of the sick (with both evidence and compassion) are dual obligations that Ibn Rushd foregrounded. Modern medicine, in aiming to become more patient-centered and holistic, finds an unlikely but welcome ally in this 12th-century polymath.

In conclusion, revisiting Ibn Rushd's *al-Kulliyyāt* is not an exercise in antiquarian interest, but a journey that reveals the deep roots of many ideas circulating in healthcare today. It highlights how historical medical philosophies can inform contemporary discourse, be it through providing context, offering alternative paradigms, or simply reminding us that the core goal of medicine has always been the same: to help human beings live in health and in harmony with their world. Ibn Rushd's *Generalities of Medicine* thus remains a relevant part of our collective medical heritage, bridging past and present and enriching our understanding of the medical art and science.

Authors' Contributions

Mufazzal M.A. conceptualized and synthesized the initial manuscript draft, with particular emphasis on the philosophical foundations and integrative framework of the study.

Yasir M. critically revised and enhanced the Unani medical components of the manuscript, ensuring alignment with classical principles and contemporary clinical standards.

Consent of Publication

Not applicable

Funding

None.

Conflict of Interest

Dr. Mohammad Abul Mufazzal and Dr. Mohammed Yasir serve as the Editorial Board Members of the International Journal of Unani and Traditional Medicine. They had no involvement in the editorial review or decision-making process regarding this manuscript. All authors declare that there are no competing interests..

Ethics Statement

Ethical approval is not applicable as the research did not involve any testing on animals or humans.

References

Ahmad, W., Ahmad, M., & Hasan, A. (2022). Understanding the pathophysiology of akhlāṭ (humors) and their relation with health and disease in Unani medicine. Journal of Research in Unani Medicine, 1(1), 1–10.

Ahmed, S. I., Rahman, A., & Masud, M. A. (2010). Clinical evaluation of a Unani formulation in metabolic syndrome. Journal of Ethnopharmacology, 132(2), 539–542.

Arnaldez, R. (1998). Averroes: A Rationalist in Islam (D. Streight, Trans.). University of Notre Dame Press.

Bell, I. R., Caspi, O., Schwartz, G. E., Grant, K. L., Gaudet, T. W., Rychener, D., ... & Weil, A. (2002). Integrative medicine and systemic outcomes research: issues in the emergence of a new model for primary health care. Archives of Internal Medicine, 162(2), 133–140.

Bleakley, A. (2014). Medical Humanities and Medical Education: How the Medical Humanities can Shape Better Doctors. Routledge.

Duffy, J. (1993). Sword of Pestilence: The New Orleans Yellow Fever Epidemic of 1853. Louisiana State University Press.

Encyclopedia.com. (n.d.). Biomedicine and Health: Galen and Humoral Theory. In Science and Its Times: Understanding the Social Significance of Scientific Discovery. Retrieved from https://www.encyclopedia.com

Gutas, D. (2001). Greek Thought, Arabic Culture: The Graeco-Arabic Translation Movement in Baghdad and Early ʿAbbāsid Society. Routledge.

Hassan, F. (2019). Holistic medicine: A historical overview and recent developments. Journal of Integrative Medicine, 17(4), 250–257.

Khan, A. (2006). Unani medicine in India – its origin and fundamental concepts. Clinical Dermatology, 26(1), 62–68.

Khan, S., Ahmad, T., & Ahmad, S. I. (2017). A concept of temperament (Mizaj) in Unani system of medicine: A review. International Journal of Unani and Integrative Medicine, 1(1), 13–16.

Lagay, F. (2002). The legacy of humoral medicine. Virtual Mentor: AMA Journal of Ethics, 4(7), 206–208.

Maizes, V., Rakel, D., & Niemiec, C. (2009). Integrative medicine and patient-centered care. Explore, 5(5), 277–289.

Patwardhan, B. (2014). Bridging Ayurveda with evidence-based scientific approaches in medicine. EPMA Journal, 5(1), 19. https://doi.org/10.1186/1878-5085-5-19

Patwardhan, B., Warude, D., Pushpangadan, P., & Bhatt, N. (2005). Ayurveda and traditional Chinese medicine: A comparative overview. Evidence-Based Complementary and Alternative Medicine, 2(4), 465–473.

Pormann, P. E., & Savage-Smith, E. (2007). Medieval Islamic Medicine. Edinburgh University Press.

Porter, R. (1997). The Greatest Benefit to Mankind: A Medical History of Humanity. W.W. Norton & Company.

Sneha, P., & Kalra, B. S. (2020). Systems biology approach in Unani medicine. Journal of Ayurveda and Integrative Medicine, 11(1), 104–108.

Tbakhi, A., & Amr, S. S. (2008). Ibn Rushd (Averroës): Prince of Science. Annals of Saudi Medicine, 28(2), 145–147. https://doi.org/10.5144/0256-4947.2008.145

Ullmann, M. (1970). Islamic Medicine. Edinburgh University Press.

Wahab, A., Zaheer, S., & Nayeem, S. (2019). Temperament (Mizaj) identification in Persian medicine with analysis of genome-wide association studies. Journal of Alternative and Complementary Medicine, 25(12), 1208–1213.

World Health Organization (WHO). (2010). Standard Unani Terminologies. WHO Regional Office for South-East Asia.

World Health Organization (WHO). (2013). WHO Traditional Medicine Strategy: 2014–2023. WHO Press, Geneva.

Yuan, H., Ma, Q., Ye, L., & Piao, G. (2016). The traditional medicine and modern medicine from natural products. Molecules, 21(5), 559. https://doi.org/10.3390/molecules21050559