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# Iran-India Scientific Interactions in the Field of Medicine during the Abbasid Caliphate: The Role of Gundishapur in Transmitting Indian Medical Heritage to the Islamic World

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Received: 15 February 2026

Revised : 13 May 2026

Accepted : 01 June 2026

Online : 01 June 2026

## Abstract

India is recognized as one of the earliest centers for the formation and flourishing of medical knowledge in the ancient world. This study, employing a library-based approach with a descriptive-analytical methodology, investigates the scientific interactions between Iran and India, with a specific emphasis on the role of Gundishapur in transmitting Indian medical heritage to the Islamic world. The findings indicate that Indian medical knowledge, particularly from the Sasanid era, entered the scientific sphere of Iran via Gundishapur. Here, it either integrated with or influenced existing medical schools. Indian physicians possessed significant expertise and experience in areas such as psychological medicine, acupuncture, and herbal medicine. This knowledge, through connections with Gundishapur, subsequently influenced medicine during the Islamic period. Furthermore, with the expansion of Islam and the conquest of India, certain Indian medical ideas and teachings found their way into the courts of the Abbasid Caliphs, and a number of Indian physicians served as medical advisors to the Caliphs. In light of the Translation Movement and the Abbasids' attention to medical sciences, several Sanskrit and Pahlavi texts were translated into Arabic. Consequently, Gundishapur served as a crucial intermediary, facilitating the transmission and development of a segment of Indian medical knowledge within Islamic civilization.

**Keywords:** Gundishapur; History of Medicine; Indian Physicians; Islamic World;

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## INTRODUCTION

India, as one of the earliest centers for the emergence of medical science, possesses a rich and deeply rooted history in this field that dates back to antiquity. In ancient times, Indian medicine was interwoven with spiritual, mythological, and religious elements; diseases were sometimes regarded as manifestations of divine wrath, and their treatment involved prayers, talismans, and recourse to supernatural powers. Brahmins- Indian religious scholars and clergy- served as intermediaries and sought the healing of patients through religious rites and practices (Najmabadi, 1992). Herbal remedies formed an integral part of treatment, and over time, the use of drugs, surgical interventions, and wound care were gradually incorporated into the repertoire of therapeutic methods. This comprehensive and multi-faceted approach enabled India to become an important hub for medical knowledge.

In his work *History of Physicians* (*Tārīkh al-Aṭibbā'*), Ibn Abī Uṣaybi'a recognizes and praises India as one of the fundamental sources of medical wisdom (Osaiba'ah, 1998). During the Islamic civilization's "golden age," Indian contributions to various sciences— particularly medicine, astronomy, and mathematics—were widely welcomed. Ya'qūbī, a historian of the third century AH, who had a profound familiarity with Indian culture and knowledge, presents Indians as pioneers in diverse fields of learning, especially medicine (Yaqubi, 1939). Likewise, Mas'ūdī, a scholar of the fourth century AH, in his travel writings, refers to his admiration for the Indians' rationality, wisdom, and abundant intelligence, and records their stringent standards for preserving sharpness of mind (Masoudi, 1989). Historical documents also indicate that the establishment of hospitals in India dates back to antiquity, approximately to the sixth century BCE. The literature of that period- including accounts related to the Buddha- suggests that one physician was appointed for every ten villages, and that hospitals were founded to care for those in need and for patients (Najmabadi, 1992). These early medical institutions emphasized principles such as cleanliness, appropriate nutrition, and attention to patients' hygiene.

Given the rich historical background and the profound influence of ancient Indian medicine, as well as its role in transmitting medical knowledge to other civilizations, a careful examination of this scientific heritage and the mechanisms of its diffusion is an undeniable necessity. Understanding this trajectory of transmission enables us to better identify the roots of much of modern medical knowledge and to draw on the experience of past societies to improve health in the contemporary world. Ancient Indian medical science, owing to its comprehensiveness, antiquity, and richness, exerted a remarkable impact on medical knowledge in the Islamic world; the School of Gundishapur, as a key institution, played a significant role in the transfer and development of this knowledge (Tajbakhsh, 2000). This study, drawing on primary historical and medical sources (such as the works of Ibn Abī Uṣaybi'a, Ya'qūbī, Mas'ūdī, and Najmābādī) and conducting a comparative analysis of Indian and Islamic texts, seeks to provide a coherent and precise account of the pathway through which medical knowledge traveled from India to the Islamic world, with a particular focus on the role of the Gundishapur school. Rather than merely listing general influences, this research aims to identify more precisely the medical scholars, texts, and concepts that were transmitted, and to analyze the central role of Gundishapur in this process. Additionally, the study endeavors to offer a more holistic understanding of Indian medicine by integrating both its spiritual and practical dimensions.

In ancient times, Indian medicine was interwoven with imaginative and transcendent elements, and diseases were often perceived as manifestations of divine anger. People resorted to prayers and talismans, while Brahmins acted as intermediaries (Najmabadi, 1992). At the same time, herbal remedies were widely used, and medical practice included the administration

of drugs, surgical treatment, and care of wounds. This multi-dimensional approach turned India into a major center of medical knowledge. Ibn Abī Uṣaybi‘a (Osaiba’ah, 1998) and Ya‘qūbī (Yaqubi, 1939) emphasize India’s status as a source of medical wisdom. Mas‘ūdī (Masoudi, 1989) also praises the Indians’ intellect and rationality. The Translation Movement demonstrates the participation of Indian migrants in transferring knowledge to the Islamic world (Ibn Nadīm, 1985).

## LITERATURE REVIEW

The Abbasid “Golden Age” (750–1285 CE) is widely regarded as a turning point in the history of science and Islamic culture, witnessing an unprecedented flourishing across diverse fields, including medicine ([https://en.wikipedia.org/wiki/House\\_of\\_Wisdom](https://en.wikipedia.org/wiki/House_of_Wisdom)). Within this broader context, the influence of Indian medicine—characterized by a rich legacy and a holistic approach—played a crucial role in shaping medical knowledge in the Islamic world, particularly during the Abbasid period. This influence was primarily realized through two main channels: (i) the migration of Indian scholars and physicians to the scientific centers of the Islamic world and their active participation in scholarly life, and (ii) the translation of Indian medical texts into the dominant languages of the time, most notably Arabic ([https://en.wikipedia.org/wiki/Graeco-Arabic\\_translation\\_movement](https://en.wikipedia.org/wiki/Graeco-Arabic_translation_movement)). Major scientific centers such as Gundishapur, which had been active even before Islam, contributed to the transfer of these forms of knowledge and subsequently served as a model for Abbasid institutions (<https://pmc.ncbi.nlm.nih.gov/articles/PMC9638627>).

After the conquest of Iran—and concomitantly, with the rise of the “Translation Movement” during the Abbasid era—particularly under the patronage of the Barmakid family, who held a special interest in Iranian and Indian culture (Majidi 2005), Indian scholars became increasingly integrated into scholarly circles in Baghdad. As a pre-Islamic center, Gundishapur served as a haven for medical elites, including Indian physicians, and contributed to the transmission of knowledge in areas such as psychiatry, the linkage of body and soul, and pharmacology (M. Niknejad 2005). Figures such as “Manka,” who emphasized knowledge of medicinal plants, and “Shanāq,” who gained renown in the domains of toxicology and antidotes, were among the prominent individuals whose works—once translated—became valuable to Muslim physicians (Zarrinkoub 2000).

Indian medicine, with its comprehensive view of the human being, its emphasis on inner balance, practical herbal pharmacology, and the interweaving of medical knowledge with philosophical and astronomical concepts, became an inspiring source for the generation of medical knowledge in the Islamic world (Nasr 1968). This approach provided a rich intellectual inheritance for scholars such as Avicenna, who found notions of temperament, herbal medicines, and bodily equilibrium within a historical framework connecting Greece, Iran, and India (Dimitri Gutas 1988). The transmission of this knowledge—through translations that were sometimes mediated first via Middle Persian (Pahlavi) or Persian and then rendered into Arabic—together with the direct presence of Indian physicians in the Abbasid court and in hospitals established in that milieu, greatly contributed to the enrichment of Islamic medicine and to the formation of a distinctive, uniquely Islamic medical identity (Nasr 2006).

## METHODS

This study employed a library-based method and a descriptive–analytical approach, grounded in an examination of historical sources in the field of medical history. The initial phase involved a purposeful search using targeted keywords such as medicine, Indian physicians, Indian medical works, Iranian (Persian) medicine, the history of medicine, and

Gundishapur. Subsequently, a thorough review of the literature on the history of medical sciences was conducted, accompanied by systematic and careful note-taking of the information gathered. To further enrich the study, reputable websites and scholarly databases were comprehensively consulted, alongside articles that were directly and indirectly related to the research topic and objectives. The culmination of this process consisted of the rigorous classification and analysis of all collected data, which were then organized in a systematic manner and presented in a well-structured written form.

## FINDINGS AND DISCUSSIONS

### Findings

Medical interactions between India, Persia, and the Islamic world represent far more than a simple transfer of technical data; they signify a complex, multi-layered process of “civilizational exchange.” Research indicates that the Academy of Gondishapur served not merely as a geographic location but as a vital conduit a platform for the reinterpretation and synthesis of distinct knowledge systems (Persian, Greek, and Indian) (Najmabadi, 1992). In this context, the integration of Indian medical knowledge into the Islamic sphere, particularly during the Abbasid era and under the patronage of political and cultural entities such as the Barmakids, elevated the medical paradigm from a predominantly Hellenocentric model to an “intercultural” one (Osaiba’ah, 1998).

The appeal and efficacy of Indian medicine for Muslim scholars stemmed from three fundamental characteristics: first, a holistic approach to health that established a profound nexus between physical, psychological, and cosmological dimensions; second, a remarkable richness in herbal medicine and practical pharmacology; and third, a methodological flexibility that blurred the traditional boundaries between medicine, astronomy, and philosophy (Ibn Nadim, 1985). These attributes established Indian medicine as a vibrant source for knowledge production; consequently, thinkers such as Avicenna did not operate in a vacuum but built upon the foundations of this multi-source heritage (Avicenna, 2005). While some historical accounts regarding Indian physicians are interspersed with narrative and mythological elements, these accounts clearly illustrate the “epistemic status” of Indian medicine within the worldview of Islamic elites (Qefti, 1992).

Ultimately, the evidence confirms that the transmission of medical knowledge from India to the Islamic world was a gradual and systematic process, originating from long-standing civilizational encounters during the Sassanid era and reaching maturity during the Islamic Golden Age. Therefore, the history of medicine in the Islamic era would be incomplete without acknowledging the active role of the Indian tradition. This tradition functioned not as a rival, but as a foundational historical pillar that facilitated the construction of classical Islamic medicine. These interactions stand as a testament to the scientific dynamism and pluralism of Islamic civilization, attesting to the convergence of ancient traditions in the formation of the sophisticated medical science of that era (Najmabadi, 1992, Osaiba’ah, 1998).

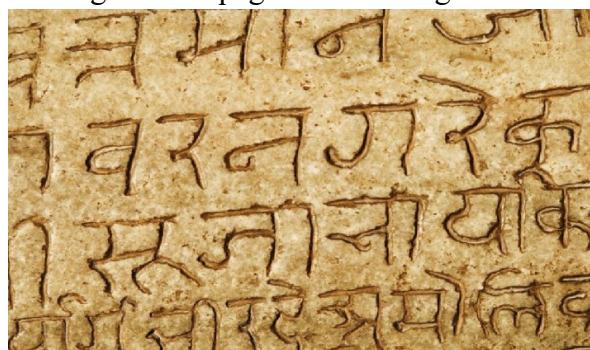
### Discussions

#### Role of Iran and the Gundishapur School in the Transmission of Medical Knowledge

Due to historical and geographical proximity to India, Iran played a vital role in scientific exchanges, particularly in the integration of Indian medical practices. Examination of Indian texts such as the *Rig Veda* (Fig. 1) indicates that their medical knowledge has a long-standing background, and that Brahmins were recognized as the earliest physicians. By around 1600 BCE, Indian society regarded medicine as a divine science, governed by specific educational and ethical standards for physicians that reflected the principles of the Hippocratic

Oath. These standards included cleanliness, kindness, compassion, abstinence from inappropriate social relations, and ethical honesty. Physicians were expected to be patient and to provide thorough attention to patients' needs. The foundations of medicine in ancient India rested on four pillars: the physician, the patient, treatment, and the caregiver. The principles governing physicians and caregivers emphasized knowledge, proficiency in the formulation of medicines, spiritual purity, proper conduct, and loyalty (Najmabadi, 19921). This commitment to health positioned India as one of the foremost pioneers of medicine and pharmacy. Ibn Abī Uṣaybi'a (Usaibi'ah, 1998) refers to the travel narrative of Asclepius and its connections with India and Iran. Many medical terms also trace their linguistic origins to Sanskrit. The theory of humors, which was prevalent in India (Sarton, 1978), likely shares ancient roots with analogous approaches in ancient Iran (Najmabadi, 1992). Within this context, the School of Gundishapur—an important scientific center in the Sasanian period founded by Shapur I played a pivotal role in transmitting Indian medical knowledge to the Islamic world. Indian scholars and physicians disseminated their works and writings through this institution, thereby exerting a profound influence on the formation of Islamic medical science. This rich legacy reflects the enduring impact of Indian medicine on the broader fabric of global medical knowledge.

Figure 1. A page from the Rig Veda



The medical school of Gundishapur (Figure 2) should be recognized as one of the most significant centers for the transmission and synthesis of medical knowledge in the ancient world and the early Islamic period. Although established before the advent of Islam, it reached its zenith during the Sasanian era, particularly under the reign of Khosrow Anushiravan. The importance of Gundishapur extended beyond mere medical education or patient treatment; its significance lay in its role as a confluence of three major medical traditions: Persian, Greek, and Indian. From this amalgamation, a distinct, supranational medical system emerged. This synthesis elevated Gundishapur beyond a simple educational institution, transforming it into a bridge between East and West, and between theoretical and practical medical traditions (Dols, 2017).

Figure 2. Ruins remaining from the University of Gundishapur, dating back more than 1,700 years

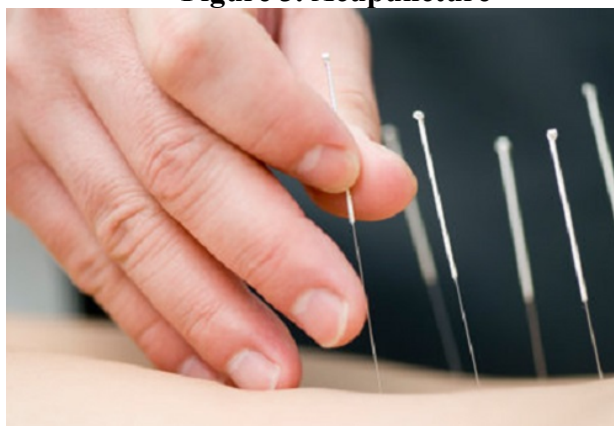


The presence and influence of Indian medicine in Gundishapur held a special significance. Certain studies suggest that Sanskrit, alongside languages such as Syriac, Greek, and Persian, had gained considerable traction within the intellectual sphere of this center. This linguistic penetration is further evidenced by the direct or indirect presence of Indian texts within later Persian and Arabic traditions. This linguistic influence was not merely indicative of lexical exchange but reflected a broader transfer of Indian medical concepts, methodologies, and therapeutic paradigms into the scientific domains of Persia and, subsequently, the wider Islamic world. In essence, Sanskrit at Gundishapur served as a conduit for a comprehensive knowledge system, rather than merely being an alien language (Sarton, 1978, Zysk, 2019).

The historical relationship between Persian and Indian medicine predates the Sasanian era, with some accounts tracing it back to the mythical period of Fereydun (Thrēta). Historically, commercial and scholarly interactions between these two civilizations persisted from the 7th century BCE onwards. These exchanges facilitated the cross-pollination of medical concepts, medicinal plants, and even certain cosmological and religious beliefs between the two traditions. From this perspective, Gundishapur was not the genesis of the Iran-India relationship but rather a locus for the accumulation and systematization of a long-standing connection. Furthermore, during this period, some theories that later gained prominence in Greek medicine were re-examined in conjunction with Eastern traditions, particularly Indian ones. References to the theory of humors, or even elements related to the quaternary and tri-elemental theories, have been explained in certain sources through Sanskrit roots or, at the very least, through shared intellectual foundations between India and Persia. While such claims necessitate scientific caution, as conceptual similarities do not automatically imply direct borrowing, the structural resemblances in temperaments, elements, and humoral explanations across Indian, Persian, and Greek traditions suggest that these worlds were not isolated from each other (Najmabadi, 1992).

Khosrow Anushiravan played a pivotal role in the advancement of Gundishapur. By attracting scholars exiled from the Byzantine Empire and providing them with a conducive environment for scientific pursuits, he transformed the center into a sanctuary for medical and philosophical elites. Within this milieu, Indian physicians also found a distinguished place, particularly in areas such as psychiatry, the psychosomatic connection, pharmacognosy, and even certain therapeutic methods that later sources refer to as acupuncture (Figure 3). The significance of this lies in the fact that Gundishapur was not merely a recipient of Indian medicine but actively reinterpreted and reorganized it alongside other traditions (Browne, 1992).

**Figure 3. Acupuncture**



One of the most intriguing accounts regarding the presence of Indian physicians in Anushiravan's court involves the response of an Indian doctor to the king's question about the

greatest human affliction. His answer—“physical ailments accompanied by psychological distress”—offers a clear illustration of the Indian understanding of the interconnectedness of body and mind. Although this anecdote is presented with some literary or narrative embellishment in certain sources, its significance lies in reflecting a holistic perspective on the human condition: illness is not merely a physical disruption but occurs within a complex network of emotions, mind, and body. This approach appears sophisticated and precise when compared to some more reductionist interpretations (Bahrami, 2006).

Following the Arab conquest of Persia, these connections were not severed. On the contrary, with the commencement of the Translation Movement during the Abbasid era and the caliphs' burgeoning interest in fields such as medicine, astronomy, and mathematics, Indian scholars and physicians became increasingly integrated into the intellectual circles of the Islamic world. At this juncture, the transfer of knowledge was no longer solely reliant on direct contact at Gundishapur. Instead, it continued through translated books, the migration of physicians, their presence in Baghdad, and even through captivity or formal invitations to royal courts. This continuity underscores that the political collapse of the Sasanians did not signify the demise of Gundishapur or its scientific legacy. Consequently, the transmission of Indian medicine post-Islam neither ceased nor was limited; rather, it persisted in a new and expanded format (Pirnia, 1983, O'Leary, 1995, Azari, 1971, Uthman, 2020). Within this process, the Barmakid family played a pivotal role. With a discernible affinity for Persian and Indian culture, they championed Indian physicians and contributed to the translation and dissemination of their works. Certain sources, including Ibn Abi Usaybi'ah and Ibn al-Nadim, document physicians who arrived at the Abbasid court or were active in Baghdad and affiliated centers of the Barmakids. This cultural policy ensured that Indian medicine in Baghdad was regarded not as a peripheral discipline but as a significant successor to Christian and Greek medicine. Even the establishment of hospitals emphasizing Indian herbal therapeutic methods gains its context within this framework (Safa, 1990, Elias, 2018).

The transfer of Indian medical knowledge to the Islamic world occurred through two primary channels: firstly, via Indian physicians who journeyed to the scientific centers of Persia and Iraq, participating in education, treatment, and translation (table 1); secondly, through the translation of Indian texts into Pahlavi, Persian, and subsequently Arabic. Muslims' initial familiarity with Indian medicine was largely acquired through the Gundishapur hospital. Following this, during the Abbasid period, this acquaintance continued directly and in an organized manner. Notably, the emphasis on botany, pharmacology, herbal pharmacy, and treatments based on natural substances allowed medicine during the Islamic period to derive tangible and practical benefits from Indian medical knowledge (Mohammadi BolbolanAbaad & Alhoei Nazari, 2011). Muslim physicians not only read these works but also actively utilized them in practice. Reports detailing explicit requests from some physicians for the importation of medicinal plants from India indicate that Indian medicine was more than just a subject of study for them; it served as a source for genuine, empirically validated treatments. This was particularly significant in the realm of pharmacy, as ancient Indians, according to some accounts, were familiar with over a hundred medicinal plants and employed them in treating various ailments (Najmabadi, 1992). Therefore, Indian ethnopharmacological knowledge represented one of the principal pathways for the infiltration of Indian medicine into medicine during the Islamic period.

**Table 1. Influential Indian Physicians and Scholars in medicine during the Islamic period**

| Row | Name                                                                           | Specialty                                            | Major Works                                                                          | Role in the Islamic World                                                                                                                                   |
|-----|--------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | <b>Mankah</b>                                                                  | Medicine, Philosophy, Botany                         | Translation of several Indian works into Persian and Arabic                          | Treating Harun al-Rashid and strengthening scholarly exchanges (Ahmad Birashk 1995; Ahmad Isa Bey 1998; Usaibi'ah 1998).                                    |
| 2   | <b>Shanaq</b>                                                                  | Medicine, Pharmacology, Toxicology, Astrology        | Al-Sumūm, Muntaqa al-Jawāhir, Fī'l-ʿIlm al-Nujūm, al-Tadbīr, The Five Notes          | Facilitated the transmission of knowledge through Persian translations and informed Muslim scholarly study (Fuat Sezgin 2001)                               |
| 3   | <b>Sanjahl</b>                                                                 | Medicine, Astrology                                  | Mawālīd al-Kabīr                                                                     | Introduction of integrated medical–astrological knowledge into Islamic tradition                                                                            |
| 4   | <b>Konkeh</b>                                                                  | Wisdom, Medicine, Astrology                          | al-Namūdhaj fī al-A'mār, Asrār al-Mawālīd, al-Qirānāt al-Kabīr, al-Qirānāt al-Ṣaghīr | Expansion of the study of Indian works in the Islamic world (Usaibi'ah 1998).                                                                               |
| 5   | <b>Ṣāliḥ ibn Bahla</b>                                                         | Medicine, Indian therapies                           | No surviving written work                                                            | Promoted “acupuncture” and exemplified the blending of Indian, Persian, and Greek medical traditions (Jamaluddin Abu al-Hasan Ali bin Yusuf al-Qifti 1992). |
| 6   | <b>Ibn Dahn</b>                                                                | Translation of Indian works, Hospital administration | —                                                                                    | Led the Barmakid hospital and contributed to translation activities (Al-Nadim 1985; Zabihollah Safa 1990).                                                  |
| 7   | <b>Judar</b>                                                                   | Medicine, Astrology, Philosophy                      | al-Mawālīd                                                                           | Among the important Indian physicians in Islamic tradition                                                                                                  |
| 8   | <b>Bakheer, Rāhī, Sīka, Qalīrfal, Jawhar, Andī, Jārī, Dāhir, Ankū, Sindbād</b> | Medicine, Pharmacology                               | No clearly identified written works                                                  | Introduced in Islamic sources as influential figures in Indian medicine (Seyyed Hossein Nasr 1987).                                                         |

When examining these physicians, it is important to note that many names are known to us today not so much through extant, precisely preserved works, but through the historical memory of Muslim scholars—recorded in sources such as Ibn al-Nadīm's *al-Fihrist* (Ibn Nadim, 1985), Ibn Abī Uṣaybi'a's *Ṭabaqāt al-Aṭibbā'* (Usaibi'ah, 1998), and Yāqūt's *Tārīkh al-Ḥukamā'* (Mohammadi & Alhuei, 2011). This point has two significant implications: first, the historical credibility of these figures is corroborated through the Islamic bibliographic tradition; second, portions of their works have either been lost or survive only in secondary reports. Consequently, studying them is simultaneously a study of the history of knowledge and the history of forgetting.

Among these figures, Mankah occupies a particularly prominent position. Known for both medicine and philosophy and proficient in Arabic, Persian, and Indian languages, he arrived in Iraq during the reign of Hārūn al-Rashīd and, with the patronage of the Barmakids, gained an important place at the Abbasid court. The account of Mankah's treatment of Hārūn al-Rashīd's seemingly incurable illness—though reported in a vividly anecdotal manner in the sources—nonetheless indicates the degree of trust placed in his medical expertise, evidenced by the granting of permanent stipends and privileges. In addition, his attention to the identification of medicinal plants contributed to his emergence as an early figure in phytopharmacology within the Islamic context (Birashk, 1995, Khan, 2017).

Shanaq is also among the most distinguished figures associated with medicine and Indian learning. As a physician, botanist, and pharmacist, and also as a scholar familiar with wisdom and astronomy, he is presented in Islamic sources as a major intellectual authority. His reputation is especially tied to toxicology and antidotes, and his works—once translated into Persian—became valuable to Muslim physicians. Beyond medical writings, titles in astronomy are also attributed to him, suggesting that the boundary between medicine and astronomy in that period was neither rigid nor strictly sealed (Mohammadi & Alhuei, 2011, Gupta, 2019). Sanjahl and Konkeh likewise fit within this broader tradition. Sanjahl, through the astronomical work *Mawālīd al-Kabīr*, and Konkeh, through works such as *al-Namūdhaj fī al-A'mār* and *al-Ṭibb wa Huwa Yajrī Majrā K...* (as cited in your source), show that in the Islamic world “Indian medicine” was not merely a matter of drugs and treatment. Rather, it was interwoven with cosmology, theories of human origination, fate, and the timing of therapy. This overlap between medicine and astronomy provides an important context for understanding the cosmic naturalism characteristic of Islamic-period medical thought (Usaibi'ah, 1998, Bahrami, 2006, Sharma, 2022).

Ṣāliḥ ibn Bahla, Ibn Dahn, and Judar contributed to this intellectual stream in their own distinct ways. Ṣāliḥ ibn Bahla, through promoting Indian therapeutic methods—especially acupuncture—was influential in shaping an entanglement among three traditions: Indian, Persian, and Greek (Khan, 2018). Ibn Dahn, active within the Barmakid milieu, exemplifies the role of translation and institutional patronage in the transmission of knowledge (Sharmr, 2020). Judar, through his astronomical and medical writings, also played a part in expanding the reputation of Indian medicine. Alongside them, names such as Bakheer, Rāhī, Sīka, Qalīrfal, Jawhar, Andī, Jārī, Dāhir, Ankū, and Sindbād, though less fully known through surviving works, indicate that the influence of Indian medicine was more widespread than the impact of a few isolated figures (Bahrami, 2006, Qifti, 1992, Gupta, 2022).

From an analytical perspective, what made Indian medicine appealing to Muslims was not merely its antiquity or its “eastern” character. Rather, three essential features mattered: first, a holistic conception of the human being and the interrelation of body and mind; second, an emphasis on phytology/phytopharmacology and the practical application of herbal remedies; and third, the integration of medicine with astronomy, philosophy, and wisdom (*ḥikma*). These features enabled Indian medicine to function, alongside Greek and Persian medicine, as a

“living” source for the production of knowledge in the Islamic world (Safa, 1990). In this respect, Islamic-period medicine cannot be understood as a mere variant of Greek medicine, since Indian medicine also played a constitutive role in its formation. If we wish to observe how these interchanges shaped the medical thought of the most prominent Islamic figures, Ibn Sīnā offers an exemplary case. Although his medical system in the *Qānūn* is organized on the basis of the four humors and the Greek tradition associated with al-Rāzī, the intellectual environment in which he thought was not disconnected from the legacy of Jundishapur and the Indian transmissions. Put differently, Ibn Sīnā inherited a conceptual apparatus in which notions of temperament (*mizāj*), herbal remedies, climate (*iqlīm*), and the internal balance of the body were formed through ongoing intellectual interaction among Greece, Persia, and India. Accordingly, Indian medicine was not a rival to Ibn Sīnā; rather, it constituted one of the historical conditions that made his system possible (Tajbakhsh, 2000, Ahmadi, 2019).

Finally, attention must be paid to the narrative nature of certain reports. Accounts such as the seemingly miraculous cures attributed to kings, exaggerated praises of physicians’ skill, or stories concerning the astonishing presence of Indian sages at royal courts cannot all be treated as straightforward historical records. Nevertheless, it would be equally mistaken to dismiss them entirely, because such narratives indicate that Muslims and Iranians of that period understood Indian medicine not simply as a set of techniques, but as credible, influential knowledge possessing cultural standing (Mohammadi & Alhoei, 2011, Chen, 2021).

In general, the transmission of Indian medicine to the Islamic world can be traced in three stages: first, the longstanding coexistence of Iran and India and the formation of shared ground; second, the concentration and flourishing of this exchange in Jundishapur—particularly during the reign of Khusraw Anūshirwān; and third, its continuation and expansion in the Abbasid period through migrating physicians, translators, and patrons such as the Barmakids. This trajectory shows that Islamic-period medicine was not built upon the shoulders of a single, uniform tradition. Instead, it emerged within a multi-sourced, cross-cultural setting, with Jundishapur serving as the principal intermediary between Indian medicine and Islamic-period medicine; without it, the history of medicine in the Islamic period would have unfolded differently (Nasr, 1987, Tajbakhsh, 2000, Rezaei, 2017).

**Table 2. The most significant works of Indian medicine transmitted to the Islamic world**  
 (Ibn Nadin, 1985, Safa, 1990)

| No. | Title of the Work               | Subject/Content                                    | Brief Description                                                                         |
|-----|---------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------|
| 1   | Sisrid                          | Signs and symptoms of diseases and their treatment | A work describing the symptoms of diseases and the methods used for their treatment.      |
| 2   | Astankar al-Jāmi‘               | Not specified in the text                          | One of the major Indian medical works translated into Arabic.                             |
| 3   | Shirk (Sīrak)                   | Signs and identification of 404 diseases           | A work on the diagnosis of diseases and their classification.                             |
| 4   | Sandistāq                       | Names of drugs                                     | A work concerned with the nomenclature of drugs and possibly pharmacological terminology. |
| 5   | Mukhtaṣar al-Hind fī al-‘Aqāqir | Botany and pharmacology                            | A work introducing medicinal plants and their applications.                               |

|    |                                          |                                                   |                                                                                   |
|----|------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------|
| 6  | <b>‘Ilājāt al-Ḥabālī</b>                 | Women’s diseases and their treatment              | A work on pregnant women and the therapeutic methods related to their conditions. |
| 7  | <b>Toqashtal</b>                         | One hundred types of diseases and their treatment | A comprehensive work on diseases and methods of treatment.                        |
| 8  | <b>Rūasā al-Hind fī ‘Ilājāt al-Nisā’</b> | Women’s diseases and their treatment              | A work on gynecology and methods of treatment.                                    |
| 9  | <b>‘Ashar Maqālāt</b>                    | Ten treatises on medicine                         | A ten-part collection dealing with medical subjects.                              |
| 10 | <b>Asmā’ ‘Aqāqīr al-Hind</b>             | Medicinal plants and their therapeutic properties | A work on Indian herbal drugs and their therapeutic uses.                         |
| 11 | <b>Ajnās al-Ḥayyāt wa-Sumūmihā</b>       | Types of poisons and pharmaceuticals              | A work on poisons, their identification, and related pharmaceutical practices.    |
| 12 | <b>Al-Tawahum fī al-Amrāḍ wa-al-ilāl</b> |                                                   |                                                                                   |

## CONCLUSION

India has long been a significant center of ancient knowledge and research, with medicine holding a deep-rooted and prominent position within its civilization. The diverse climatic, geographical, and biological landscape of the subcontinent fostered the development of various therapeutic approaches, leading to the flourishing of branches such as herbal medicine, psychotherapy, and certain traditional healing methods. This scientific legacy not only remained within India’s borders but gradually found its way to other scientific and cultural hubs, most notably Persia. Among these centers, the Academy of Gondishapur played a pivotal role in absorbing, reinterpreting, and transmitting Indian medical knowledge, serving as a bridge between Indian civilization and the Perso-Islamic world. This scholarly connection further expanded during the Sasanian era and, subsequently, with the advent of Islam. Indian physicians and scholars were present at Gondishapur, drawing the attention of Persian kings and intellectuals to Indian sciences, particularly medicine and astronomy. Later, during the Abbasid Caliphate, especially from the time of Harun al-Rashid, many Indian medical teachings entered the Caliphal court, and Indian physicians gained recognition alongside their Muslim counterparts as respected consultants and healers. The patronage of influential families, such as the Barmakids, also contributed significantly to the dissemination and validation of this knowledge. During this period, numerous Indian medical texts were translated from Sanskrit and Pahlavi into Arabic, enriching the medical corpus of the Islamic era.

Overall, Gondishapur can be considered one of the most crucial links in the transmission of Indian medical knowledge to the Islamic world. This academic institution was not merely a meeting point for diverse healing traditions but also catalyzed a dynamic scientific exchange among India, Persia, and Islamic civilization. Therefore, studying these interactions reveals that medicine during the Islamic period was, to a considerable extent, the product of dialogue and exchange between civilizations, with India playing a foundational and enduring role.

## AUTHOR CONTRIBUTIONS

Mohammad Hashemimehr was born in Iran. First, he graduated in Persian literature and then continued his major in English and taught for 18 years as an English teacher. He was interested in studying history, especially the History of Medicine, so he started researching it and graduated in September 2019. Now he is a PhD student in the History of Medicine at Mazandaran University of Medical Sciences in Iran, working and teaching at Babol University of Medical Sciences in Iran. He is also interested in getting information about world literature, history, and art, and has published papers in this field, and likes to do research. Farah Ahad is a medical professional with a passion for delivering exceptional patient care. She completed her schooling at Saint Joseph's Higher Secondary School in Baramulla, Kashmir, and later pursued her MBBS degree at Tehran University of Medical Sciences and Technology in Iran. Currently, she is serving as a medical intern at Government Medical College in Udampur, India, where she is honing my clinical skills and gaining valuable experience in the medical field. In addition to her clinical work, she is enthusiastic about research and has contributed to several papers in her field. She is driven by a desire to stay up-to-date with the latest.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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