

Abū Bakr Moḥammad Ibn Zakriyā Al-Rāzī (Rhazes): Father of Paediatric

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Abstract

Abū Bakr Moḥammad Ibn Zakriyā Al-Rāzī, a distinguished physician of the 9th–10th centuries, made ground-breaking contributions that significantly shaped the discipline of paediatrics and advanced the knowledge and treatment of infectious diseases. His scholarly works, which include the renowned texts *Kitāb al-Hāwi* and *Kitāb al-Judri wa al-Hasbā*, underscore the critical importance of preventive health measures, stringent hygiene practices, and the necessity of implementing age-appropriate treatments tailored specifically for children. *Al-Rāzī* made a significant distinction between the illnesses that affect children and those that are prevalent in adults, advocating for a therapeutic approach that is uniquely tailored to the specific health needs of the younger population. His ground-breaking monograph, titled *Kitāb al-Tibb al-Atfāl*, systematically addressed the various aspects of paediatric care, offering insights that were revolutionary for his time. Furthermore, *Al-Rāzī*'s meticulous and detailed descriptions of diseases such as smallpox and measles enhanced the precision of diagnostics, thereby improving the understanding of these conditions and their management. His insightful contributions laid the essential foundations for the evolution of modern paediatrics as well as for the contemporary approach to infectious disease management, influencing several generations of medical practitioners and researchers in subsequent eras.

Keywords: Rhazes (Rāzī), measles, smallpox, paediatric diseases, medieval physician.

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1. INTRODUCTION

Abū Bakr Moḥammad Ibn Zakriyā Al-Rāzī, born in Rey, was an outstanding physician renowned for his significant contributions to medicine and paediatrics [1,2,3]. While he initially followed the teachings of Hippocrates and Galen, two pillars of classical medicine, *Al-Rāzī* critically evaluated and ultimately rejected their four humors theory. Instead, he emphasized the importance of his own clinical observations and empirical evidence, marking a progressive shift toward a more scientific and observation-based approach in medicine [4]. He is celebrated as the Father of Paediatrics for pioneering specialized medical care for children [5]. His dedication to studying childhood diseases and developing tailored treatments laid the foundation for paediatrics as a distinct medical discipline. By combining critical thinking with hands-on clinical experience, *Al-Rāzī* advanced medical

knowledge and influenced both Islamic and later European medicine.

Zakriyā Al-Rāzī was a prominent physician and scholar who challenged the long-standing medical authority of Galen. In his critical work *Doubts about Galen* (*Shukuk 'ala Jalinus*), he questioned and re-evaluated several of Galen's ideas, advocating for medical knowledge to be based on direct observation and practical experience rather than blind adherence to tradition [1,6,7]. His landmark work, *Kitāb al-Hāwi* (*Continens Liber*), emerged as a cornerstone of medieval medical literature, encompassing a vast compilation of his meticulous clinical insights and innovative therapeutic methods. *Al-Rāzī* was also a pioneer in the field of infectious diseases, being the first to introduce the concept of differential diagnosis in this domain. 8

His ground-breaking work *Kitab al-Judari wa al-Hasbah*, a fourteen-chapter treatise on measles and

smallpox, provides a comprehensive understanding of these diseases. It distinguishes between measles and smallpox, highlighting distinct prodromal signs, providing a reliable method for accurate diagnosis, especially in children, and addressing the medical framework of his era [9]. His emphasis on careful clinical differentiation laid the foundation for more precise medical practice and contributed greatly to the development of epidemiology and infectious disease management in the Islamic Golden Age. *Al-Rāzī's* work outlines therapeutic approaches for managing measles and smallpox, emphasizing methods to lower fever, ease breathing, safeguard the eyes, care for the skin, ensure proper hydration, apply gentle cooling interventions, and uphold cleanliness in the surroundings. He adapts treatment to patient age and constitution, advocating gentle methods for children.

Al-Rāzī's paediatric approach was revolutionary, he recognized the need for specialized care, catalogued paediatric diseases with precision, and applied empirical methods to treat young patients. His emphasis on observation, hygiene, pharmacology, and patient well-being prefigures modern paediatric principles. His paediatric treatise systematically covers diseases across paediatric populations, including skin disorders, eye and ear ailments, gastrointestinal issues (vomiting, distension, diarrhoea, constipation), and neurological conditions such as paralysis, epilepsy, and hydrocephalus [10,11,12].

Modern paediatrics benefits from molecular diagnostics, immunology, vaccination, and standardized protocols—areas absent in *Al-Rāzī's* time. Still, shared principles remain: attentive observation, ethical care, and systematic treatment approaches echo *Al-Rāzī's* methods, affirming his enduring relevance. This paper offers a historical and medical review of *Al-Rāzī's* contributions to paediatric medicine. It examines his methodologies, clinical writings, ethical principles, and enduring influence on medieval and Renaissance medical practice, affirming his rightful place in history as a foundational figure in child healthcare.

2. MATERIAL AND METHODS

This research focuses on the analysis and acknowledgement of information extracted from the pivotal medical text, *Kitāb al-Hāwī*, *Kitāb al-Mansūrī*, *Kitāb al-Judri wa al-Hasbā* authored by *Abū Bakr Moḥammad Ibn Zakriyā Al-Rāzī*. Furthermore, the exploration extends beyond these traditional sources by incorporating perspectives from modern academic literature. This includes a thorough review of peer-reviewed journals, research articles, and contemporary publications, thereby creating to establish a comprehensive framework that not only draws upon historical insights but also effectively connects them with contemporary academic discourse and emerging ideas.

3. OBJECTIVES

This research paper aims to thoroughly explore and acknowledgement of the pioneer work of *Abū Bakr Moḥammad Ibn Zakriyā Al-Rāzī* in the field of Paediatrics.

4. LITERATURE REVIEW

4.1 Paediatric Contributions: Treatise and Innovations

4.1.1 Kitāb al-Hāwī (Continens Liber)

In *Kitāb al-Hāwī* (Continens Liber), *Al-Rāzī* included dedicated chapters on the diseases of children, showcasing his progressive approach toward paediatrics in the medieval Islamic world. These chapters compiled detailed case observations, symptom descriptions, and therapeutic measures for a range of childhood ailments, including neonatal care, teething disorders, fevers, digestive problems, and respiratory illnesses [13,14,15]. *Al-Rāzī* often differentiated paediatric conditions from similar adult disorders, emphasizing that children required distinct diagnostic consideration and treatment strategies. His clinical discussions reflected a methodical reliance on observation and practical experience rather than strict adherence to earlier medical authorities [16,17].

Preventive health was another prominent feature of these paediatric chapters, as *Al-Rāzī* stressed the role of hygiene, balanced diet, and careful monitoring of growth in ensuring child wellbeing. He advocated age-appropriate treatments; favouring mild and non-invasive remedies to suit a child's developing body.¹⁸ By integrating such detailed paediatric insights within a comprehensive medical encyclopaedia, *Al-Rāzī* not only advanced the understanding of child-specific illnesses but also helped shape the early foundations of paediatrics as a distinct field in Islamic medical scholarship.

4.1.2 Kitāb al-Mansūrī

In *Kitāb al-Mansūrī fī al-Tibb* (The Book of Medicine Dedicated to al-Mansur), *Al-Rāzī* devoted specific sections to paediatric diseases, demonstrating his recognition of the unique medical needs of children. These passages addressed topics such as infant nutrition, weaning, teething troubles, and common childhood ailments including fevers, diarrhoea, and respiratory conditions [13]. *Al-Rāzī's* descriptions were based on direct clinical observations, distinguishing between diseases that were exclusive to childhood and those that manifested differently in adults. His recommendations emphasised careful, gentle treatment and the avoidance of overly aggressive interventions in young patients [16].

Preventive measures were also a central theme in these paediatric discussions. *Al-Rāzī* highlighted the importance of clean surroundings, appropriate clothing, and balanced diets to support healthy growth and development [19,20,21]. He linked the health of children to broader public health concerns, suggesting that the wellbeing of the young was a cornerstone for a healthy

society. By incorporating comprehensive paediatric instructions into the widely disseminated *Kitāb al-Mansūrī*, *Al-Rāzī* ensured that his expertise in child healthcare was accessible to physicians throughout the Islamic world, subsequently shaping medical understanding through its Latin translations in medieval Europe [22].

4.1.3 *Kitāb al-Judri wa al-Hasbā*

Al-Rāzī's Kitāb al-Judri wa al-Hasbā (Treatise on Smallpox and Measles) stands as one of the most significant early works in the history of infectious diseases. Written in the 9th–10th century, it is widely recognised as the first detailed clinical description that clearly differentiates between smallpox and measles [13]. Prior to this, earlier physicians often confused the two diseases due to similarities in their rash presentations. *Al-Rāzī* meticulously documented the distinct symptomatology, disease progression, and outcomes of both conditions, emphasising differences in fever patterns, lesion morphology, and patient recovery timelines [23]. His work not only reflected careful observation but also advanced diagnostic precision in an era dominated by Galenic medical traditions. *Al-Rāzī* incorporated Galen's discussions on smallpox and measles into his own work, yet enriched them with his personal clinical observations to draw a clearer distinction between the two illnesses, particularly in paediatric cases. He sought to provide a more precise understanding by describing the unique features of each disease, ensuring that physicians could identify them accurately in children [24,25,26,27]. This combination of inherited medical knowledge and first-hand experience allowed him to enhance diagnostic clarity and improve patient care.

The treatise is remarkable for its systematic approach to disease description. *Al-Rāzī* began by outlining the etiology as understood in his time, explaining how humoral imbalance could predispose individuals to these diseases, while also acknowledging environmental and seasonal influences.¹⁸ He described prodromal symptoms in detail, noting that measles often began with coryza, cough, and conjunctivitis, whereas smallpox was more likely to present with severe back pain and a more abrupt onset of pustular rash. Such distinctions helped physicians make earlier and more accurate diagnoses, thereby improving patient management [22].

In addition to his diagnostic insights, *Al-Rāzī* provided practical therapeutic guidance for both diseases. He advocated for supportive care, hydration, and the use of cooling remedies during the febrile phase, while warning against unnecessary bloodletting in children [19]. His therapeutic recommendations were tailored to patient age, constitution, and disease severity, reflecting an early understanding of personalised medicine. Furthermore, he stressed the importance of proper ventilation and hygiene in the patient's

environment, anticipating modern concepts of infection control and prevention.

The influence of *Kitāb al-Judri wa al-Hasbā* was profound, as it was translated into Latin in the 18th century and widely circulated in Europe, where it shaped medical understanding of these diseases for centuries [13]. Its emphasis on empirical observation over blind adherence to inherited doctrine marked a turning point in clinical medicine. By distinguishing smallpox from measles with precision and providing practical, age-appropriate care recommendations, *Al-Rāzī* not only contributed to medieval Islamic medicine but also laid foundations that would resonate in epidemiology and infectious disease management well into the modern period.

4.1.4 *Kitāb al-Tibb al-Atfāl* (Book on Diseases of Children)

Al-Rāzī authored the earliest known monograph dedicated entirely to the care of children *Kitāb al-Tibb al-Atfāl*, often referenced in Latin as *Practica Puerorum* or “Booklet on the Ailments of Children and their Care”—a ground-breaking work with 24 chapters addressing diseases of new-borns, infants, and children [10,27]. It reflects *Al-Rāzī's* systematic approach to child health. It discusses developmental physiology, infant nutrition, breastfeeding, congenital disorders, childhood fevers, infections, and gastrointestinal diseases.¹³ He understood that children differed fundamentally from adults and therefore needed uniquely designed treatment approaches suited to their specific needs. This pioneering text addressed the diagnosis, prevention, and treatment of childhood illnesses at a time when paediatric medicine was not yet recognized as a distinct branch of healthcare [28]. It covered a wide range of topics, including infant nutrition, hygiene, and developmental milestones, reflecting *Al-Rāzī's* holistic approach to child health.

In this treatise, *Al-Rāzī* emphasized the importance of understanding the unique physiological and developmental needs of children, distinguishing their ailments from those of adults [29,30]. He advocated for gentle and age-appropriate treatments, highlighting the significance of early medical intervention and proper caregiving in ensuring healthy growth.

Al-Rāzī offered clear, practical guidance to physicians and caretakers, including how to wean infants, soothe teething pains, and treat common paediatric ailments like diarrhoea, worms, and epilepsy [31]. His holistic view integrated emotional and psychological care with physical treatment—a concept far ahead of his time. By producing such a focused and detailed work, *Al-Rāzī* not only demonstrated his compassion for younger patients but also laid the foundations for paediatrics as a specialized medical discipline.

4.1.5 Breastfeeding and Infant Nutrition

Al-Rāzī placed special emphasis on the importance of breastfeeding and maternal health. He recommended exclusive breastfeeding for the first two years of life and offered guidelines on maternal diet and hygiene. When breastfeeding was not possible, he advised on the preparation of milk substitutes, demonstrating an understanding of paediatric nutrition and digestion [32].

4.1.6 Recognition of Paediatric Physiology

One of his major breakthroughs was acknowledging that children's bodies respond differently to medication. He advocated for gentler drugs and reduced dosages, noting that children were more sensitive to pain, heat, and dehydration. This concept—physiological specificity of age—is a cornerstone of modern paediatrics.

5. Broader Medical Contributions and Their Paediatric Implications

Though paediatric medicine was a specialized focus, *Al-Rāzī*'s wider medical contributions enriched paediatric care:

5.1 Disease Differentiation

His clear distinction between smallpox and measles laid a foundation for paediatric infectious disease understanding [8,33,34].

5.2 Pharmacology and Pharmacy

Innovations in drug formulation, experimental therapies, and pharmacy apparatus indirectly benefited paediatric prescriptions with safer and more accurate dosing tools [34,35].

5.3 Clinical Institutions

Leadership roles in hospitals provided platforms for training and implementing paediatric practice, placing children's health in institutional contexts [36,37].

5.4 Ethics and Empathy

His insistence on patient dignity, including in mental health care, influenced paediatric care's sensitive and supportive approach—especially notable in early psychiatric aftercare [10,38].

6. LEGACY AND INFLUENCE

Al-Rāzī's works spread—via Latin translations—to European universities and influenced medical education through the medieval period and into the Renaissance. His works *Kitāb al-Hāwī* and *Kitāb al-Mansūrī* remained central medical texts for centuries.^{35,36} His paediatric treatise, though less referenced than some of his other works, earned recognition as the first paediatric monograph—earning him the lasting title “Father of Paediatrics” [10,34]. This distinction reflects his pioneering role in elevating children's health to a field worthy of specialized

attention. His broader medical philosophy—evidence-based practice, ethical standards, and empathetic care—remains deeply relevant to current medical pedagogy and practice.

7. DISCUSSION

Abū Bakr Moḥammad Ibn Zakriyā Al-Rāzī, sometimes referred to as *Al-Rāzī* or Rhazes, is regarded as the “father of paediatric medicine” because of his significant impact on the emergence of paediatric health as a separate medical specialty. The practice of paediatrics in the Islamic world throughout the Middle Ages was greatly influenced by his ground-breaking publications and clinical observations, which established fundamental ideas that remain applicable today. *Al-Rāzī* was one of the earliest medical scholars to clearly identify paediatrics as a distinct branch of medicine. He outlined unique paediatric pathologies that differed from adult diseases, advocating for tailored approaches to diagnosis and treatment in children rather than merely extrapolating adult practices.

His treatises, such as *The Diseases of Children*, covered a wide spectrum of childhood illnesses, nutritional needs, and preventive care, demonstrating rigorous clinical observation and experimentation. *Al-Rāzī* emphasized the value of mild, non-invasive therapies, placing the well-being and comfort of his young patients at the forefront of care. He emphasized the psychological and hygienic well-being of children, understanding the long-term impacts of early health on adult life. His holistic model considered the body and mind, an approach that aligns with modern paediatric principles.

Recent research highlights *Al-Rāzī*'s careful documentation of diseases, his differentiation between hereditary and acquired ailments, and his early establishment of paediatrics as a formal discipline, centuries before it was recognized in Europe. Researchers still study *Al-Rāzī*'s medical approaches to understand the historical development of paediatric treatment and training. *Al-Rāzī*'s paediatric work also intersects with broader developments in medical ethics and the organization of healthcare. He advocated for rational, empirical inquiry and for compassionate care, setting standards that medical professionals still aspire to. Modern paediatrics benefits from molecular diagnostics, immunology, vaccination, and standardized protocols—areas absent in *Al-Rāzī*'s time. Still, shared principles remain: attentive observation, ethical care, and systematic treatment approaches echo *Al-Rāzī*'s methods, affirming his enduring relevance.

Limitations and Future Research

While *Al-Rāzī*'s approaches were advanced for his time, some limitations existed compared to modern standards. His reliance on observation and trial-and-error sometimes lacked the rigorous controls of contemporary clinical research. Nonetheless, his legacy warrants

further exploration. Modern scholars recommend in-depth comparative studies between *Al-Rāzī's* texts and present-day paediatric protocols to appreciate the historical trajectory and continuing relevance of his work.

8. CONCLUSION

Abū Bakr Muḥammad ibn Zakariyyā al-Rāzī's legacy as the “Father of Paediatrics” is well warranted. Through his early paediatric treatise, empirical clinical methods, and compassionate care ethos, he laid foundational stones for a medical discipline that continues to evolve centuries later. Though overshadowed by limitations of medieval medicine, his pioneering spirit in paediatric care endures in modern principles of child health. Continuing to study *Al-Rāzī* enriches our appreciation of medical history and affirms the timeless value of rigorous, empathetic, and innovative clinical practice.

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