

Review Article

Concept of *Umoor-e-tabiya* in pediatric physiology: an integrative review of *al-Arkān*, *al-Mizāj* and *Akhlāt*

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ABSTRACT

The Unani system of medicine conceptualizes human physiology through a set of seven fundamental natural principles known as *Umūr Ṭabī'īyya* (*Umoor-e-tabiya*), which govern growth, development, and maintenance of health. Childhood represents a unique physiological phase characterized by rapid growth, high metabolic activity, and distinct constitutional attributes, yet the interpretation of *Umūr Ṭabī'īyya* in the context of modern pediatric physiology remains inadequately explored. This review aims to critically examine the Unani concepts of *al-Arkān* (elements), *al-Mizāj* (temperament), and *Akhlāt* (humours) and interpret their relevance to pediatric physiological processes. A comprehensive literature search was conducted using PubMed, Scopus, and Google Scholar for contemporary biomedical literature, alongside classical Unani texts and authoritative reference works, focusing on pediatric physiology, growth, metabolism, and constitutional assessment. Relevant data were extracted and synthesized using a narrative and integrative approach, correlating classical Unani principles with established concepts in modern pediatric science. The review demonstrates that the Unani designation of childhood as a *Hārr Raṭb* (hot and moist) state closely parallels modern understanding of elevated basal metabolic rate, high total body water content, tissue plasticity, and developmental homeostasis in children. The humoral predominance of Dam and Balgham is shown to correspond with contemporary insights into pediatric hematology, immunity, and fluid physiology. This integrative synthesis supports the view that *Umūr Ṭabī'īyya* represents an early systems-based physiological framework that remains conceptually relevant to modern pediatrics. Incorporating these principles may enrich integrative pediatric assessment, education, and individualized healthcare approaches.

Keywords: *Umūr Ṭabī'īyya*, Pediatric physiology, Unani medicine, *al-Mizāj*, *Akhlāt*, Integrative medicine

INTRODUCTION

The Unani system of medicine, originating in the doctrines of Hippocrates and Galen and later elaborated by Arab and Persian scholars, is based on a holistic and integrated model of human biology.^{1,2} At its core lies the concept of *Umūr Ṭabī'īyya* (lit. “natural principles of life” or “factors of existence”), which are described as seven fundamental physiological principles in Unani medicine. These principles form the conceptual framework through which classical physicians explained human development, health, and disease.³ These principles form a harmonious, hierarchical system that explains the organism from its

most basic material composition to its most complex observable functions. Within this framework, health is defined as a state of dynamic equilibrium among the seven components, while disease represents a disruption of this balance.¹ This equilibrium is maintained by an intrinsic, self-regulating, and self-preserving power known as *Ṭabī'at* or *Quwwat Ṭabī'īyya* (Medicatrix Naturae).⁴ *Ṭabī'at* represents the body's innate capacity to preserve equilibrium among the *Umūr Ṭabī'īyya*, combat disease, and restore health. Unani physicians (*hakīms*) regard their role as assisting this natural healing force externally by prescribing therapies that help re-establish the body's inherent harmony.⁵

The conceptual structure of *Umūr Ṭabīʿiyya* closely parallels the hierarchical organization described in modern systems biology. It progresses logically from the most fundamental material causes (*Asbāb Mādīyya*), which constitute the body's building blocks, to the ultimate physiological outcomes. Within this hierarchy, the elements (*al-Arkān*) represent the most remote material cause; these combine to form the humors (*Akhlāt*), which in turn nourish the organs (*Aʿdāʾ*)—the immediate substrates of physiological function.⁶ This progression

from the elemental to the functional mirrors modern biological organization, which extends from atoms and molecules to cells, tissues, organs, and integrated systems.⁶ Such a systemic perspective highlights the logical foundation of Unani physiological theory, positioning it as an early precursor to contemporary holistic and integrative approaches to medicine. To guide the present analysis, the seven *Umūr Ṭabīʿiyya* and their corresponding physiological domain are outlined in Table 1.

Table 1: The seven *Umūr Ṭabīʿiyya* and their corresponding physiological domains.

<i>Umūr</i> (factor)	English equivalent	Core physiological domain
<i>Al-Arkān</i>	Elements	Material and biochemical composition of the body.
<i>Al-Mizāj</i>	Temperament	Individual constitutional nature, homeostatic balance.
<i>Akhlāt</i>	Humours	Vital body fluids, fluid dynamics, and biochemical signaling.
<i>Aʿdāʾ</i>	Organs	Anatomical structures and systems of the body.
<i>Arwāḥ</i>	Vital Spirit/Pneuma	Bio-energy, life force, and carrier of physiological powers.
<i>Quwā</i>	Faculties/Powers	Inherent physiological capacities for function (e.g., digestion, cognition).
<i>Afʿāl</i>	Functions	Observable physiological actions and processes of the body.

Aims and objectives

The purpose of this literature review is to examine the role and relevance of *al-Arkān*, *al-Mizāj*, and *Akhlāt* within the framework of *Umūr Ṭabīʿiyya* in pediatric physiology, integrating classical Unani perspectives with insights from contemporary pediatric science to enhance both academic understanding and clinical application in Unani pediatrics.

METHODS

A narrative and integrative review methodology was adopted to examine the relevance of *Umūr Ṭabīʿiyya* in the context of pediatric physiology. A comprehensive literature search was conducted across electronic databases including PubMed, Scopus, and Google Scholar to identify contemporary biomedical studies related to pediatric growth, metabolism, body composition, hematology, immunity, and developmental physiology. Search terms included combinations of “pediatric physiology,” “childhood growth,” “basal metabolic rate in children,” “body water composition,” “pediatric hematology,” and “developmental homeostasis.”

In parallel, classical Unani literature was reviewed using primary and secondary sources, including foundational texts such as *Kulliyāt-e-Qānūn*, *Ifāda-e-Kabīr*, *Kulliyāt-e-Nafīsī*, *Kitāb al-Mukhtārāt fī al-Ṭibb*, and other authoritative Unani compendia. Contemporary scholarly reviews on Unani and Persian medicine were also included to contextualize classical concepts within modern academic discourse.

Inclusion criteria encompassed classical descriptions and modern scientific studies relevant to *al-Arkān*, *al-Mizāj*, and *Akhlāt* with explicit or implicit applicability to pediatric physiology. Articles focusing solely on adult

physiology without developmental relevance were excluded. Data extraction emphasized conceptual definitions, physiological roles, and clinical implications of Unani principles, along with corresponding modern physiological correlates.

The extracted information was synthesized using a thematic and comparative approach, mapping Unani concepts onto established pediatric physiological parameters. The analysis prioritized interpretative integration rather than mere compilation, allowing the formulation of an evidence-based, systems-oriented perspective on pediatric physiology grounded in *Umūr Ṭabīʿiyya*.

RESULTS

The age of growth (Sinn-i-Numū / Sinn-i-Ḥadāthat): defining the unique physiological state of childhood

In Unani medicine, the span of life from birth until the completion of physical growth (approximately 25–30 years of age) is designated as *Sinn-i-Numū* (age of growth and development). This period is not limited to childhood; rather, it encompasses the entire pre-adult phase of human life.^{7–9}

The distinctiveness of *Sinn-i-Numū* lies in the predominance of two fundamental vital forces: 1) *Harārāt Gharīziyya* (innate Heat) – the inherent source of vitality and metabolic activity and 2) *Ruṭūbat Gharīziyya* (innate Fluid) – the essential substrate that sustains innate heat.

During this phase, *Ruṭūbat Gharīziyya* exists in excess relative to the amount required to preserve *Harārāt Gharīziyya*, thereby supporting the processes of rapid growth and tissue development.

This age is further subdivided into distinct physiological stages mentioned in Table 2.

Table 2: Sub-stages of *Sinn-i-Numū* (age of growth and development) in Unani medicine.

Stage (Unani term)	English equivalent	Approximate age range (years)	Defining features
<i>Sinn-i-Tufūlat</i>	Infancy	Birth–1	Rapid growth; weak limbs; locomotion by crawling ^{18,20}
<i>Sinn-i-Şabā</i>	Early childhood	1–7	Able to stand and walk; organs not fully toned; incomplete dentition (milk teeth not fully shed, permanent teeth not fully erupted) ^{8,18,20}
<i>Sinn-i-Tara‘ru‘</i>	Late childhood/adolescence	7–13	Organs stronger; permanent dentition complete; puberty not yet attained ^{8,18,20}
<i>Sinn-i-Rihāq/Sinn-i-Bulūgh</i>	Puberty	13–19/21	Onset of puberty; facial and pubic hair growth; gonadal maturation; secondary sexual characteristics appear ^{8,18,20}
<i>Sinn-i-Fatā</i>	Youth	19/21– ~30	Final stage of growth; full physical maturation achieved; cessation of growth ^{8,18,20}

Al-Arkān (the elemental basis): from primordial components to pediatric constitution

Theories regarding the number of elemental constituents (*Arkān*) have varied across traditions; however, the Unani system universally recognizes the human body as being composed of four fundamental elements, termed *Arkān Arba ‘a* (the four elements).

The concept of *Al-Arkān* (singular: *Rukn*), also referred to as ‘*Anāşir*’ or elements, constitutes the first keystone of the *Umūr Ṭabī‘iyya*.⁷ In Unani philosophy, *Arkān* are regarded

as simple, indivisible, primary constituents from which the human body, and indeed all matter in the universe, is composed. They are considered the material causes (*Asbāb Māddiyya*) of existence. The classical framework, inherited from Greek philosophers such as Empedocles, identifies four primary elements: *Al-Nār* (fire), *Al-Hawā’* (air), *Al-Mā’* (water), and *Al-Arḍ* (Earth).^{10,11}

The unique proportion and intermixture (*Imtizāj*) of these four elements are believed to be established at the time of conception, thereby forming the fundamental blueprint of an individual’s physical constitution.¹²

Table 3: The four *Arkān* (elements), their qualities, and physiological roles.

Element (<i>Rukn</i>)	Qualities (<i>Kayfiyāt</i>)	Physiological function (Unani view)
<i>Al-Nār</i> (Fire)	Hot & dry ^{7,8,17}	Maturation, transformation, metabolism
<i>Al-Hawā’</i> (Air)	Hot & moist ^{7,8,17}	Respiration, vitality, lightness
<i>Al-Mā’</i> (Water)	Cold & moist ^{7,8,17}	Nutrition, hydration, flexibility
<i>Al-Arḍ</i> (Earth)	Cold & dry ^{7,8,17}	Structure, stability, organ formation

While the terminology of the ‘four elements’ may appear antiquated within contemporary scientific discourse, contemporary interpretations reveal it as a conceptually sophisticated model. Unani physicians argued that the four *Arkān* should not be understood literally as earth, water, air, and fire, but symbolically, as representations of the four states of matter: *al-Arḍ* as the solid state, *al-Mā’* as the liquid state, *al-Hawā’* as the gaseous state, and *al-Nār* as the state of transformed energy or heat.¹³ This interpretation demonstrates the intellectual evolution of the concept—from a philosophical abstraction to a proto-scientific framework aligned with physical reality.

Each element is characterized by a pair of inherent, binary qualities (*Kayfiyāt*). These qualities are dynamic and classified into two active (*Kayfiyāt Fā‘ila*)—heat and cold—and two passive (*Kayfiyāt Munfa‘ila*)—dryness and moistness. The interactions and combinations of these

qualities form the foundation of all bodily structures and metabolic functions. Later Unani scholars explicitly linked these qualities with the states of matter, thereby integrating cosmological, physical, and physiological thought.

Each element possesses a unique set of inherent qualities (*Kayfiyāt*), which determine its specific physiological role within the human body, as summarized in Table 3.

The Role of Al-Arkān in forming the pediatric body: a unani perspective on growth and structure

According to classical Unani texts, children (*Atfāl*) are predominantly governed by *Al-Nār* (fire) and *al-Mā’* (water), resulting in a constitutional *Mizāj* defined as *Hārṛ Raṭb* (hot and moist). This unique balance has distinct physiological implications in pediatric growth and development.¹⁴

The influence of *al-Arkān* on the distinctive physical and physiological characteristics of the pediatric population

can be understood through their specific correlations, as presented in Table 4.

Table 4: Correlation of pediatric features with Al-Arkān.

Pediatric feature	Correlating Al-Arkān	Explanation (Unani and modern)
Rapid growth	Dominance of <i>Al-Nār</i> and <i>Al-Mā'</i>	<i>Al-Nār</i> provides the metabolic heat (<i>Harārat</i>) to drive cell division; <i>Al-Mā'</i> provides the material substrate for tissue expansion. ²⁷
Soft, elastic skin	Dominance of <i>Al-Mā'</i> and <i>Al-Hawā'</i>	High <i>Ratuba</i> (water) ensures softness; <i>Al-Hawā'</i> imparts porosity (<i>Takhalkhul</i>), preventing tissue rigidity. ²⁸
High respiratory rate	Functional interaction of <i>Al-Nār</i> and <i>Al-Hawā'</i>	The intense innate heat (<i>Al-Nār</i>) of childhood requires increased air exchange (<i>Al-Hawā'</i>) for <i>Tarweeh</i> (vital cooling). ²⁷
High body water content	Dominance of <i>Al-Mā'</i>	Reflects the elemental dominance of Water, manifested as 70–75% TBW in infants (vs. 55% in adults). ²⁸
Skeletal pliability (cartilaginous)	Relative deficiency of <i>Al-Ard</i>	<i>Al-Ard</i> provides <i>Salabat</i> (rigidity). Its relative deficiency allows for cartilage dominance and bone flexibility. ²⁹

The doctrine of *al-Arkān* provides the primordial foundation of human constitution, serving as the material substratum of life and growth. In pediatrics, the predominance of *al-Nār* and *al-Mā'* explains the rapid, moist, and flexible nature of the child's body, while relative deficiency of *al-Ard* accounts for weak structural stability.⁸ Yet, it is not the elements in isolation but their unique intermixture (*Imtizāj*) that determines an individual's *Mizāj* (temperament). Thus, the transition from *al-Arkān* to *al-Mizāj* represents the logical next step in understanding the pediatric constitution, linking the material basis of life to its functional and constitutional expression. While *al-Arkān* provide the material substrate of existence, their interactions generate *al-Mizāj*, the constitutional state that determines individual physiology.

Al-Mizāj (temperament): the unique constitution of the child

Following the elemental basis of *al-Arkān*, the concept of *al-Mizāj* (Temperament) emerges as the unique constitutional signature of an individual. *Al-Mizāj* is a new, balanced quality that results from the dynamic interaction (*Imtizāj*) of the four primary qualities inherent in the elements: hotness (*Harārat*), coldness (*Burūdat*), moistness (*Ruṭūbat*), and dryness (*Yubūsat*). When these opposing qualities interact, their original intensities are diminished, giving rise to a new, stable state that governs an individual's physical, physiological, and even psychological traits. This resulting temperament is the central pillar upon which Unani diagnosis, personalized medicine, and therapeutics are built.

Al-Mizāj represents the constitutional signature of an individual, organ, or substance, and serves as the central pillar of Unani physiology upon which the entire Unani system of diagnosis, personalized medicine, and therapeutics rests. As Hippocrates is credited with stating, "It is more important to know what sort of person has a disease than to know what sort of disease a person has".¹⁵ This philosophy is embodied in the concept of *Al-Mizāj*,

which defines an individual's physical, physiological, and even psychological characteristics.^{2,6}

The four temperaments of body depending on the dominant fluid (Humour) are: 1) Sanguinous temperament (*Damawī al-Mizāj*) – hot & wet, 2) Phlegmatic temperament (*Balghamī al-Mizāj*) – cold & wet, 3) Bilious temperament (*Ṣafrāwī al-Mizāj*) – hot & dry, 4) Melancholic temperament (*Sawdāwī al-Mizāj*) – cold & dry.^{7,16,17}

Temperament of children (Mizāj al-Ṣibyān)¹⁸

A cornerstone of Unani pediatrics is the recognition that the entire period of growth and development, known as *Sinn-i-Numu* (from birth to approximately 25-30 years of age), is characterized by a specific and dominant temperament: *Hārr Raṭb*, or hot and moist.^{9,18,19} This classification reflects a dynamic physiological state, driven by the maximal presence of *Harārat Gharīziyya* (innate heat) and *Ruṭūbat Gharīziyya* (innate moisture) in the body, both of which are essential for the anabolic processes of growth.

The physiological state of dominant heat and moisture during *Sinn-i-Numū* gives rise to the defining characteristic of the pediatric constitution: a dominant *Mizāj* of *Hārr Raṭb* (hot and moist). This temperament constitutes the natural and necessary state for growth, providing the physiological foundation for development.

The *Hārr* (hot) quality is considered more dominant in children than in *Sinn-i-Shabāb* (youth) or *Sinn-i-Kuhūlat* (adulthood). This corresponds to their higher *Istihāla Qayediya* (basal metabolic rate) than that of adults. The "Hot" (*Hārr*) quality of the pediatric *Mizāj* corresponds to the high basal metabolic rate required to generate the energy for constant cellular division, tissue synthesis, and physical activity. It is the engine of anabolism that drives growth in height and weight. As age increases, B.M.R.

gradually decreases, indicating a corresponding decline in *Harārat Gharīziyya*.

According to *Jālīnūs* (galen), *Harārat* (innate heat) children and adults are similar, however in infants *harārat* is mild in quantity and it is accompanied by a predominance of moisture.^{17,20} As the B.M.R is high in children, they possess a greater quantity of this heat in the form of *Harārat Gharīziyya* and for this reason Allama Nafees quoted those children have the hottest temperament on the basis of quantity of *Harārat Gharīziyya*.^{14,18}

The "Moist" (*Raṭb*) quality reflects the high-water content of a child's body, the pliability of their tissues, and the abundance of nutritive fluids (*Akhlāṭ*) needed to build their physical structure. This moisture provides the essential plasticity that allows bones to lengthen, organs to grow, and the entire body to expand.

In *Sinn-i-Numū*, during the stage of growth, both *Ruṭūbat Gharīziyya* (innate humour) and *Harārat Gharīziyya* (innate heat) are dominant (Allama Nafees) because, at this stage, the body is actively developing. Growth is only possible when the organs have sufficient tension and elasticity, which cannot happen without adequate moisture and heat.¹⁴

Abundant moisture is essential because it allows the organs to stretch easily and adapt to different shapes. Abundant heat is necessary because heat stimulates movement. Movement in all directions—length, width, and depth—stimulates growth in various organs.¹⁴

Another argument for the predominance of moisture and heat in the *Sinn-i-Numū* is that the embryo is formed from semen and blood—and these two substances are hot and moist.^{8,14}

Children and adults have an equal amount of heat in terms of quantity, but because children contain more moisture, their heat is softer and milder.^{8,14,18}

This classical Unani designation serves as a remarkably accurate qualitative descriptor of the core principles of modern pediatric physiology.

The "Hot" (*Hārr*) quality

This directly corresponds to the elevated basal metabolic rate (BMR) in children. Per unit of body weight, infants and children have a much higher BMR than adults, reflecting the immense energy expenditure required for rapid cell division, tissue synthesis, and overall physical growth. The "heat" of the pediatric *Mizāj* is the Unani expression of this high metabolic furnace.

The "Moist" (*Raṭb*) quality

This correlates with the higher percentage of total body water in the pediatric population. A newborn's body is approximately 75% water, which gradually decreases to the adult level of about 60%.¹⁸ This high fluid content is essential for cellular plasticity, nutrient transport, and the biochemical reactions that underpin growth. The "moisture" of the pediatric *Mizāj* reflects this fluid-rich, pliable state of developing tissues.

Modern correlation

The physiological manifestations of the pediatric *Mizāj* and the potential pathological tendencies arising from its imbalance can be systematically correlated with modern clinical observations, as summarized in Table 5.

Table 5: Physiological manifestations and pathological predispositions of the Pediatric *Mizāj*.

Temperamental quality	Physiological manifestation in children	Pathological predisposition (when imbalanced)
Hot (<i>Hārr</i>)	High basal metabolic rate, rapid cellular division, fast growth, high energy and activity levels, quick pulse, reddish complexion. ^{27,30}	Propensity for high fevers, inflammatory conditions (e.g., skin rashes), irritability, rapid pulse during illness, thirst, and quick exhaustion of energy. ^{31,32}
Moist (<i>Raṭb</i>)	High body water content, soft and pliable tissues (<i>Laham wa Shahm</i>), sound and often deep sleep (<i>Naum</i>), good appetite, and rapid tissue repair. ²⁸	Susceptibility to phlegmatic disorders (<i>Balghami Amraz</i>), such as upper respiratory infections with excessive mucus, loose stools or diarrhea, lethargy, and puffiness. ^{33,34}

Clinical assessment of pediatric *Mizāj*: a review of classical and contemporary criteria

The clinical determination of an individual's *Mizāj* has traditionally been a qualitative art, based on the assessment of ten parameters known as *Ajnās 'Ashara*. These include observable features such as tactile qualities of the skin (touch), Muscles and Fat, hairs (color, thickness, growth),

body complexion (skin color), physique (build), responsiveness of organs, sleep and wakefulness, excreta of the body (urine, stool, sweat), physical and psychic functions.²¹

In a significant step towards standardizing this assessment for evidence-based practice, recent research in Persian Medicine (a tradition sharing the same roots as Unani) has sought to establish objective criteria for pediatric *Mizāj*.²²

A four-round Delphi study involving expert practitioners was conducted to determine the major and minor criteria for identifying *Mizāj* in children.²² This study represents the most current and rigorous effort to create a validated

tool for pediatric constitutional assessment. The consensus findings provide a clinically applicable framework for practitioners, as summarized in Table 6.

Table 6: Major and minor criteria for *Pediatric Mizāj* assessment (based on the Delphi consensus study).

Dimension	Major criteria	Minor criteria
Hotness-Coldness	1. Physical functions (activity, speech); 2. Impressibility to weather/food; 3. Tactile condition (skin temperature); 4. Speech (frequency, speed, loudness); 5. Psychic functions (personality); 6. Physique	1. Fat/Muscle; 2. Growth; 3. Skin color; 4. Hair growth; 5. Hair amount; 6. Sleep duration; 7. Appetite; 8. Hair color
Wetness-Dryness	1. Fat/muscle composition; 2. Sleep depth and duration; 3. Tactile condition (skin softness/hardness); 4. Hairstyle (e.g., curly vs. straight)	1. Physique; 2. Physical functions; 3. Impressibility; 4. Sleep induction; 5. Psychic function; 6. Growth; 7. Speech; 8. Hair growth; 9. Hair amount; 10. Skin color

Table 7: Clinical significance of *Pediatric Mizāj* traits.

Feature/condition	Related <i>Mizāj</i> trait (Unani)	Clinical significance
Rapid wound healing	<i>Ḥārr</i> (heat) / <i>Ḥarārat Gharīziyya</i>	High vascularity and metabolic rate accelerate tissue regeneration and closure. ^{30,35}
Irritability and restlessness	<i>Ḥārr</i> (heat) → <i>Su-e-Mizaj Ḥārr</i>	The "hot" temperament lowers the threshold for neuronal excitability (low sensory threshold). ^{36,37}
Frequent, soft stools	<i>Ḥārr</i> (heat) + <i>Raṭb</i> (Moisture)	<i>Ruṭūbat</i> softens stool consistency; <i>Ḥarārat</i> increases gastric motility (gastrocolic reflex). ^{38,39}
Drooling and secretions	<i>Raṭb</i> (moisture)	Physiological hypersalivation due to immature swallowing; reflects high mucosal water content. ^{27,40}
Susceptibility to dehydration	High <i>Taḥlīl</i> (dissolution) of <i>Ruṭūbat</i>	The intense metabolic heat constantly evaporates body water, necessitating high fluid turnover. ^{28,41}

Having outlined the theoretical basis of *al-Mizāj*, it is essential to examine its clinical implications, particularly in pediatric practice where constitutional assessment guides diagnosis and therapy.

Clinical implication of pediatric *Mizāj*

The clinical relevance of pediatric *Mizāj* can be appreciated through its characteristic traits and their implications for common pediatric conditions, as outlined in Table 7.

Akhlāt (humours): fluids of life and their role in pediatric health and disease

The third foundational principle, *Akhlāt* (singular: *Khilt*), refers to the four primary body fluids or humours. The humoral theory, famously postulated by Hippocrates, is a central tenet of Unani medicine, explaining the body's physiology, pathology, and therapeutic responses. *Akhlāt* are defined as the moist and fluid components of the body that are produced through four stages of digestion (*Hudūm Arba'a*) and metabolism of food, primarily in the liver. They are the essential substances that provide nourishment and immunity, facilitate growth and repair, and preserve the life of the individual.^{23,24}

The four humours, or *Akhlāt Arba'a*, each possess qualities inherited from the elements and have distinct physiological roles: *Dam* (blood) – hot & moist – nutritional and life-sustaining, *Balgham* (Phlegm) – cold & moist – lubricating, protective, *Ṣafrā'* (yellow bile) – hot & dry – digestive, excitatory, *Sawdā'* (black bile) – cold & dry – structural, stabilizing.^{7,24}

Health is maintained when these four humours exist in a state of qualitative and quantitative equilibrium, a condition known as eucrasia. Disease, conversely, arises from dyscrasia, an imbalance in their proportion or quality.^{24,25}

Humoral physiology in children: nourishment, growth, and immunity

The humoral profile of a child is unique and directly reflects their dominant *Ḥārr Raṭb Mizāj* and their primary physiological imperatives. The two most critical physiological tasks of childhood are growth and the development of a robust immune system. Consequently, the humours of *Dam* and *Balgham* are of paramount importance in pediatric physiology.

Dominance of Dam (blood)

Given that the primary function of *Dam* is nourishment and growth, it is considered the most essential and predominant humour during *Sinn-i-Numū*. The healthy production of high-quality blood is the sine qua non of pediatric well-being, as it provides the building blocks for the rapid construction of tissues and organs. A deficiency or poor quality of *Dam* would manifest as what modern medicine calls failure to thrive, malnutrition, or anemia.^{24,25}

Importance of Balgham (Phlegm)

The Balgham humour is critically involved in two areas vital to children: immunity and lubrication. Unani medicine views immunity as being supported by Balgham. This aligns with the modern understanding of the role of mucosal secretions (a form of phlegm) and lymphocytes in defending against pathogens. A child's immune system is constantly maturing and encountering new challenges, making the state of their Balgham a key indicator of their immunological health. Furthermore, the lubricating function of Balgham is essential for the joints and tissues of a rapidly growing and highly active child.²⁴

The *Hārr Raṭb* temperament of childhood is materially sustained by a corresponding predominance of the humour *Dam* (Blood), which itself possesses a hot and wet temperament. This creates a naturally sanguine (*Damawī al-Mizāj*) state in children, which is essential for growth. Blood, in Unani physiology, is the primary nutritive humour, responsible for carrying nourishment and the vital force (*Rūḥ*) to every organ and tissue of the body.^{24,26}

Among all the substances in the body, blood is considered the most important. It is the main component that supports

the body's nourishment—everything that is lost or broken down is replaced by blood. During the *Sinn-i-Numū*, blood supplies more than what is lost or broken down.

Blood has hot and moist temperament, and during the warmer stages of life—such as the *Sinn-i-Numū* it is abundant.

Blood contains more moisture than heat. This is because the main role of blood is to nourish the body, a process that relies on moisture rather than heat. Its benefit lies in supporting the body's growth and development.

During *Sinn-i-Numū*, the body's demand for building materials is relentless. This necessitates a highly active and efficient process of digestion and humour formation (*Istihāla*) to continuously generate high-quality blood. For this reason, Unani pediatrics places immense emphasis on the quality of a child's nutrition, as the food and drink consumed are directly transformed into the *Akhlāṭ* that will construct the child's developing body (*A'dā'*).^{24,26} Any deficiency or impurity in the diet can lead to the production of abnormal humours, disrupting the delicate balance required for healthy growth and predisposing the child to disease.

Correlation with modern physiology: Akhlāṭ in the context of pediatric hematology, endocrinology, and immunology

Unani literature suggests that *Akhlāṭ* encompasses a wider range of body fluids than just blood, including substances that modern medicine identifies as hormones, thus framing the humoral system as an early conceptualization of the body's complex biochemical signaling network. The proposed correlations are detailed in Table 8.

Table 8: Correlation of Unani Akhlāṭ with modern pediatric physiological systems.

Unani humour (<i>Khilṭ</i>)	Proposed modern correlate in pediatrics	Modern physiological parallel
Dam (Blood)	Hematopoietic system (erythrocytes, plasma, nutrients, growth factors)	<i>Dam</i> Dominance – High blood volume to body ratio, rapid growth. Bone marrow is highly cellular (hyperplastic) with high erythropoiesis ^{42,43}
Balgham (phlegm)	Immune/lymphatic system (lymphocytes, iga, mucus, synovial fluid)	Functional immaturity of immune coordination (lymphocyte maturation), mucous overproduction ^{44,45}
Ṣafrā' (yellow bile)	Hepato-biliary system and inflammatory markers (bilirubin, liver enzymes, pro-inflammatory cytokines)	Low <i>Ṣafrā'</i> – Immature bile acid synthesis ^{46,47}
Sawdā' (black bile)	Neuro-endocrine and mineral homeostasis (neurotransmitters, iron, calcium, melanin)	Low <i>Sawdā'</i> – Weak mineralization, cartilage dominance ²⁹

This integrative framework allows for a dialogue between traditional wisdom and modern science, potentially enriching both fields. It suggests that Unani diagnostic insights into humoral imbalances could be correlated with

modern laboratory markers, paving the way for a truly integrative and evidence-based approach to pediatric medicine.

DISCUSSION

The authors interpret *Umūr Ṭabī'īyya* as an early, coherent, and systems-oriented physiological framework that anticipates several foundational principles of modern pediatric physiology. Rather than representing static philosophical constructs, *al-Arkān*, *al-Mizāj*, and *Akhlāṭ* collectively describe a dynamic regulatory network governing growth, metabolism, structural development, and homeostasis during childhood. The Unani characterization of the pediatric period as *Hārr Raṭb* (hot and moist) is not merely descriptive but reflects a precise qualitative understanding of the heightened anabolic state, elevated basal metabolic rate, increased total body water, and tissue plasticity that define pediatric physiology.

From an interpretative standpoint, the authors propose that Unani physicians conceptualized childhood as a biologically adaptive phase optimized for growth, with innate heat (*Ḥarārat Gharīziyya*) functioning as the metabolic driver and innate moisture (*Ruṭūbat Gharīziyya*) serving as the essential structural substrate. The predominance of Dam and Balgham in children further suggests an early recognition of the central roles of hematopoiesis, immunity, and fluid regulation in pediatric health. This integrated view aligns closely with contemporary concepts of developmental homeostasis and systems biology.

The authors contend that revisiting *Umūr Ṭabī'īyya* through the lens of modern pediatric science provides not only historical validation but also conceptual tools for integrative pediatric assessment and education. When interpreted scientifically, these principles offer a valuable framework for understanding constitutional variability, growth patterns, and disease susceptibility in children, reinforcing the relevance of Unani physiology in contemporary integrative medicine.

CONCLUSION

The Unani concepts of *al-Arkān*, *al-Mizāj*, and *Akhlāṭ* offer a remarkably sophisticated and integrative framework for understanding pediatric physiology. This review establishes that these ancient principles are not merely historical artifacts but are congruent with modern scientific paradigms. Integrating this classical wisdom into contemporary practice can enrich diagnostic perspectives, promote individualized therapeutic strategies, and pave the way for an evidence-based, holistic approach to pediatric healthcare. This synthesis validates the Unani model as a valuable system for both theoretical and clinical application in the 21st century.

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