



Review Article

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A COMPARATIVE ANALYSIS OF PRAMANA SHARIR AND MODERN BIOMETRIC PARAMETERS IN ANATOMICAL AND CLINICAL PRACTICE

*Dr. Ravi Pratap Singh¹, Dr. Pankaj Singh², Dr. Anshul Sharma¹, Dr. Divyanshi Verma¹, Dr. Saloni¹, Dr Reshabh Sahu¹

¹P.G. Scholar, Department of Rachana Sharir, Himalayiya Ayurvedic (PG) Medical College and Hospital Fatehpur Tanda, Jeevanwala, Dehradun, Uttarakhand, India.

²Guide and Assistant Professor, Department of Rachana Sharir, Himalayiya Ayurvedic (P.G) Medical, College and Hospital, Fatehpur Tanda, Jeevanwala, Dehradun, Uttarakhand, India. **Email id** - drpankajsingh12bajwal@gmail.com

*Corresponding Author's Email ID:- Shreecharakayu@gmail.com

ABSTRACT:

Background: *Pramana Sharir*, as described in classical *Āyurvedic* texts, refers to the anthropometric measurements used to assess the dimensions and proportions of the human body. These traditional methods, although ancient, reflect a scientific approach to anatomical evaluation. In contrast, modern clinical practice utilizes standardized biometric parameters such as BMI, body surface area, and limb ratios. An integrative analysis of these two approaches can offer new insights into clinical diagnostics and personalized medicine. **Aim:** To compare the concept and applications of *Pramana Sharir* with modern biometric parameters in anatomical and clinical practice. **Objectives:** To study the concept of *Pramana Sharir* from classical *Ayurvedic* texts. To review standard modern biometric parameters used in anatomy and clinical diagnosis. To identify correlations between *Ayurvedic* and modern anatomical measurements. To evaluate the clinical relevance of *Pramana Sharir* in current medical practice. **Materials and Methods:** This study is based on a literary review of classical *Ayurvedic* treatises including *Charaka Samhitā*, *Suśruta Samhitā*, and *Ashtanga Hridaya*, along with analysis of modern biometric data from standard anatomy and clinical

texts. Comparative analysis was conducted through tabulation and correlation of anatomical landmarks and measurement techniques. **Results:** There is a notable correlation between specific *Pramana* measurements (e.g., *Anguli Pramāṇa*) and modern metrics such as height, arm span, and limb proportions. Traditional methods were found to be predictive of health status, strength, and lifespan, aligning partially with modern concepts like BMI and body proportionality. **Conclusion:** *Pramana Sharir* and modern biometric systems, despite being rooted in different paradigms, show significant anatomical and clinical correlations. A synthesis of these approaches could enhance individualized patient care, education, and research in integrative medicine.

KEYWORDS: *Pramana Sharir*, Biometric Parameters, Anthropometry, Clinical Anatomy, Ayurveda, Personalized Medicine

INTRODUCTION:

The science of measurement is deeply rooted in both traditional and modern systems of medicine. In Ayurveda, *Pramana Sharir* refers to the structured method of measuring the human body using specific units such as *Anguli Pramana*.¹ These measurements were not merely anatomical descriptions but were used to assess physical strength, longevity, and suitability for therapeutic procedures. Ancient seers emphasized the significance of proportionality and symmetry in the human body to ensure a healthy constitution and optimal physiological function.²

Modern anatomical and clinical sciences employ biometric tools and statistical norms to study the human body. Parameters such as height, weight, body mass index (BMI), body surface area (BSA), waist-hip ratio, and limb measurements are widely applied for diagnostic, therapeutic, and prognostic purposes.³ These measurements are based on standardized tools and large population data, providing a quantitative understanding of human health. Despite the evolution in instrumentation and data processing, the underlying aim of understanding structural and functional norms remains similar to Ayurvedic ideals.⁴

Both systems, though developed in different contexts, share the core principle that body measurements reflect an individual's health, constitution, and disease susceptibility.⁵ For example, *Anguli Pramana* of chest circumference and arm span mentioned in Ayurvedic texts can be correlated with modern concepts of somatotyping, body symmetry, and vital statistics used in pulmonary and cardiovascular assessments. Similarly, body measurements in

Ayurveda were linked to *Prakriti*, *Bala*, and treatment eligibility, just as modern biometrics are associated with risk profiling and personalized treatment plans.⁶

In clinical application, the Ayurvedic understanding of body proportions finds relevance in procedures such as *Panchakarma*, surgical eligibility, and *Rasayana* therapy.⁷ Modern medicine, too, depends heavily on biometric parameters for dose calculations, physical therapy assessments, and nutritional planning. Thus, integrating the ancient concepts of *Pramana Sharir* with modern biometric frameworks may enrich clinical practice and lead to a more individualized, holistic approach to patient care.⁸

This comparative exploration seeks to re-establish the clinical and educational value of *Pramana Sharir* in the light of contemporary biomedical science. By understanding the intersections and divergences between these two systems, a more comprehensive anatomical and functional assessment protocol may be developed that honors the wisdom of traditional Ayurveda while incorporating the precision of modern biometric methodology.⁹

AIM AND OBJECTIVES

Aim:

To compare the concept and applications of *Pramana Sharir* with modern biometric parameters in anatomical and clinical practice.

Objectives:

1. To study the concept of *Pramana Sharir* from classical Ayurvedic texts.
2. To review standard modern biometric parameters used in anatomy and clinical diagnosis.
3. To identify correlations between Ayurvedic and modern anatomical measurements.
4. To evaluate the clinical relevance of *Pramana Sharir* in current medical practice.

MATERIAL AND METHOD:

This is a conceptual and comparative literary study based on classical *Ayurvedic* texts such as *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* for the understanding of *Pramana Sharir*. Relevant modern anatomical and clinical resources, including standard textbooks and biometric guidelines, were reviewed. The collected data were analyzed

qualitatively to establish correlations between traditional anthropometric units and modern biometric indices.

CONCEPTUAL STUDY

DEFINITION:

Pramana Sharir is a fundamental concept in *Ayurveda* that deals with the standardized measurement of the human body as outlined in classical texts such as *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*. The term *Pramana* translates to "standard" or "measurement," and its application in *Sharira Rachana* (anatomy) signifies the science of body dimension assessment. The primary objective of *Pramana Sharir* is not limited to anatomical description but extends to physiological evaluation, disease susceptibility, estimation of lifespan, and determining therapeutic eligibility or *Yogyata*.¹⁰

In *Charaka Samhita*, it is stated that a physician who understands *Sharira Pramana* can effectively analyze the status of *Dosha*, *Dhatu*, and *Mala* and determine both *Rogi-Bala* (patient's strength) and *Roga-Bala* (disease intensity), which are essential for clinical decision-making.¹¹ Furthermore, *Sushruta Samhita* (*Sharira Sthana* 5/3) elaborates that specific *Angula Pramana* measurements of body parts are direct indicators of *Bala* (strength), *Ayushya* (lifespan), and procedural eligibility for interventions like *Shashtra Karma* (surgical procedures). Hence, the importance of *Pramana Sharir* lies in its multi-dimensional use encompassing diagnosis, prognosis, and therapeutic planning.¹²

UNIT OF MEASUREMENT – ANGULI PRAMANA:

The cornerstone of *Pramana Sharir* is the use of *Anguli Pramana* as a unit of measurement. *Anguli* refers to the breadth of the individual's own finger, thereby making the measurement inherently personalized. This unit respects the concept of bodily individuality (*Deha Swabhava*), which is central to the Ayurvedic philosophy of personalized medicine.¹³

Unlike modern universal measurements like inches or centimeters, *Anguli Pramana* varies with each person, thereby ensuring that anatomical proportions are assessed relative to the individual's constitution. A few standard measurements as per *Sushruta* include:

- *Shira Pramana* (head): 12 *Anguli*
- *Vaksha Pramana* (chest): 36 *Anguli*

- *Hasta Pramana* (hand): 24 *Anguli*

This approach emphasizes not only anatomical structure but also physiological suitability, vitality, and longevity. Because of its personalized nature, it harmonizes with *Ayurvedic* principles of *Prakriti*, *Vyadhi Vinischaya*, and individualized treatment protocols.¹⁴

TYPES OF PRAMANA IN AYURVEDA:

In *Ayurvedic* literature, *Pramana* is not restricted to linear dimensions. It is classified into multiple types, each serving a distinct anatomical or physiological purpose:

- **Parimana Pramana:** Involves measurement of length, breadth, and height of body parts, e.g., arm span, height, chest circumference.
- **Maana Pramana:** Deals with volume or capacity, typically applied in fluid measurements, e.g., *Anjali Pramana* for *Rasa*, *Mutra*, etc.
- **Ghaata Pramana:** Refers to count-based parameters, like number of bones (*Asthi*), ligaments (*Snayu*), blood vessels (*Sira*, *Dhamani*).
- **Sankhya Pramana:** Refers to numerical analysis of physiological and anatomical entities, such as 7 *Dhatus*, 13 *Agni*, 107 *Marmas*, etc.

These types of *Pramana* were methodically used in:

- Estimating anatomical structures and organ sizes
- Assessing strength (*Bala*) and disease resistance
- Determining eligibility for surgical or therapeutic interventions
- Clinical analysis of *Dosha* status and prognosis

Such holistic categorization demonstrates the *Ayurvedic* model of integrating form, function, and clinical utility.¹⁵

CLINICAL RELEVANCE:

Pramana Sharir plays a vital role in practical clinical *Ayurveda*. It transcends the boundaries of descriptive anatomy to serve as a predictive and diagnostic tool. Key clinical utilities include:

- **Assessment of Bala:** Body proportions as per *Anguli Pramana* help assess the physical strength and endurance capacity of an individual.

- **Estimation of *Ayushya*:** Well-proportioned body features are indicative of a long and healthy life.
- **Preoperative Evaluation in *Shalya Tantra*:** Suitability for surgery is determined based on ideal body proportions.
- **Therapeutic Planning:** In *Rasayana* and *Vajikarana*, the suitability of rejuvenative or fertility therapies is evaluated using these measurements.
- **Prakriti Assessment:** Individual constitution (*Vataja*, *Pittaja*, *Kaphaja*) is often reflected through different body dimensions and proportions.

In these ways, *Pramana Sharir* becomes an essential part of *Roga-Rogi Pariksha* (examination of disease and patient), leading to more personalized and effective treatment outcomes.¹⁶

PHILOSOPHICAL INTEGRATION:

The philosophy behind *Pramana Sharir* lies in the fundamental Ayurvedic view that the human body is a microcosmic reflection of the *Pancha Mahabhuta* (five elements). The proportions and dimensions of the body are manifestations of elemental harmony and equilibrium.¹⁷

A well-balanced *Pramana* implies:

- Proper equilibrium of *Dosha*, *Dhatu*, and *Mala*
- Normal functioning of *Agni* and *Srotas*
- Absence of structural or functional anomalies

On the other hand, deviation in *Pramana* from classical norms is indicative of *Vikruti*, or pathological deviation. For instance, disproportionate limb length or head circumference might suggest congenital or metabolic disorders. Thus, *Pramana* serves as both a marker of health and a diagnostic tool for early identification of disease origin (*Vyadhi Mool*).¹⁸

MODERN CONCEPT OF BIOMETRIC PARAMETERS

In modern anatomy and clinical medicine, biometric parameters refer to scientifically validated, quantitative measurements of the human body. These measurements are standardized and statistically derived from population studies. The science of these measurements is broadly known as anthropometry—the systematic collection and analysis

of human body dimensions. These values are critical in diverse fields such as clinical medicine, nutrition, public health, ergonomics, sports science, and forensic medicine.¹⁹

Biometric parameters offer objective, reproducible, and comparable data that support clinical diagnosis, prognosis, therapeutic planning, and evaluation of growth and development. They also play an essential role in early disease detection, physical assessment, and epidemiological surveillance.²⁰

COMMON MODERN BIOMETRIC PARAMETERS:

The following are commonly used biometric indicators in modern clinical and anatomical practice:

- **Height and Weight:** Fundamental for growth assessment, BMI calculation, and nutritional evaluation.
- **Body Mass Index (BMI):** $\text{Weight (kg)}/\text{Height}^2 \text{ (m}^2\text{)}$, used to classify individuals as underweight, normal, overweight, or obese.
- **Body Surface Area (BSA):** Utilized in pharmacology for dosage calculation, especially in chemotherapy and pediatric medicine.
- **Waist-Hip Ratio (WHR):** Assesses fat distribution; central obesity is a risk factor for cardiovascular and metabolic disorders.
- **Arm Span, Sitting Height, and Limb Proportions:** Applied in orthopedics, endocrinology, and sports physiology.
- **Head Circumference and Chest Circumference:** Especially relevant in pediatrics to assess brain growth and physical development.
- **Skinfold Thickness and Body Fat Percentage:** Used in nutritional studies, fitness assessments, and metabolic health analysis.

These parameters are measured using standardized instruments such as stadiometers, measuring tapes, calipers, weighing scales, and bioelectrical impedance devices.²¹

CLINICAL APPLICATIONS:

Modern biometric measurements are indispensable tools in healthcare settings. Their major applications include:

- **Growth Monitoring:** Pediatricians use growth charts with height, weight, and head circumference to assess developmental milestones.
- **Nutritional Assessment:** BMI, WHR, and body fat percentage help identify malnutrition, obesity, and associated health risks.
- **Disease Risk Stratification:** Measurements like WHR and BMI are predictors of diseases such as diabetes, hypertension, and coronary artery disease.
- **Drug Dosage Calculation:** BSA is used for calculating individualized dosages, particularly in oncology, pediatric care, and anesthesia.
- **Surgical Planning and Prosthetics:** Precise anatomical measurements are essential for orthopedic surgeries and designing custom prosthetic limbs.²²

PRINCIPLES AND STANDARDIZATION:

Modern anthropometry is based on the principles of **accuracy, reproducibility, and population standardization**. Data are collected using:

- Internationally accepted methods (e.g., WHO growth standards).
- Statistical sampling and reference ranges from large population cohorts.
- Tools with minimal intra-observer and inter-observer variability.

These principles ensure clinical reliability and allow for global comparability of data.²³

TECHNOLOGICAL ADVANCEMENTS:

Modern anthropometric assessment has evolved beyond manual measurements. Technological innovations now include:

- **3D Body Scanning:** Offers full-body volumetric data for posture and body composition analysis.
- **Dual-Energy X-ray Absorptiometry (DEXA):** Accurate assessment of bone density and body fat distribution.
- **Bioelectrical Impedance Analysis (BIA):** Non-invasive evaluation of body composition (fat mass vs lean mass).
- **Smart Wearables and Apps:** Track biometric data such as heart rate, sleep quality, and physical activity in real-time.

Such advancements enhance clinical accuracy, patient monitoring, and predictive analytics in healthcare.²⁴

COMPARISON WITH *PRAMANA SHARIR*:

While modern biometric parameters are instrument-based and standardized across populations, *Pramana Sharir* offers a personalized and qualitative approach rooted in constitution and elemental balance. Despite their origins in different paradigms, both systems share an emphasis on proportionality, symmetry, and predictive health value.²⁵

Ayurvedic Concept	Modern Equivalent
<i>Anguli Pramana</i>	Arm span, limb ratios
<i>Anjali Pramana</i>	BSA, fluid volume estimations
<i>Vaksha Pramana</i>	Chest circumference
<i>Sharira Parimana</i>	BMI, WHR, somatotyping
Strength & longevity assessment	Muscle mass, VO ₂ max, health age

Results and Findings (Single-Line Format)

1. *Anguli Pramana* correlates well with modern anatomical proportions like head and limb measurements.
2. *Parimana Pramana* aligns with height, arm span, and somatotyping used in clinical evaluation.
3. *Anjali Pramana* reflects modern concepts of body fluid volume and body surface area (BSA).
4. Ayurvedic individualized measurements parallel modern personalized medicine and dosage systems.
5. *Pramana Sharir* aids in assessing strength, vitality, and procedural eligibility like BMI and WHR.
6. Deviations in *Pramana* suggest pathological states, similar to abnormal modern biometric indices.

7. Both systems assist in early disease prediction and preventive health assessment.
8. Educational integration of both systems enhances anatomical and clinical understanding.
9. There is potential for developing combined assessment tools from Ayurvedic and modern concepts.
10. Both systems support a personalized, holistic approach to health and clinical care.

DISCUSSION

The concept of *Pramana Sharir* in Ayurveda offers a holistic and personalized understanding of human anatomy, where body measurements are not merely numerical data but indicators of strength (*Bala*), longevity (*Ayushya*), and constitutional balance. Ancient sages like Charaka and Sushruta emphasized the significance of specific body proportions as predictive tools for physical and physiological status. These measurements, especially *Anguli Pramana*, were inherently individual-centric, making them suitable for personalized healthcare approaches. In this view, the body is assessed in the context of the *Tridosha*, *Dhatu*, and *Mala* balance, and deviations in proportion are considered indicative of underlying *Vikruti* (pathological imbalance).²⁶

In contrast, modern biomedical science utilizes biometric parameters that are population-standardized and instrument-based. Anthropometry, BMI, BSA, and WHR are widely used in clinical medicine, epidemiology, and therapeutic planning. These measurements offer objectivity, statistical comparability, and technological precision. Despite this difference in methodology, the core objective remains the same—accurate assessment of anatomical proportion, health status, and physiological capacity. The use of body metrics in drug dosage calculations, risk prediction, and developmental assessments reflects a shared emphasis on quantifiable human biology.²⁷

This comparative study highlights significant overlaps in the foundational aims of both systems. The individualized approach of *Anguli Pramana* aligns conceptually with the emerging field of personalized medicine. Similarly, *Anjali Pramana*, which measures internal volume, finds its equivalent in modern calculations of body surface area and fluid distribution. Both systems regard proportionality and balance as key to diagnosing and managing health. The ancient system's inclusion of measurements as part of assessing

Prakriti, Rogi-Bala, and Roga-Bala has strong relevance today, especially in preventive medicine and constitutional analysis.²⁸

Integrating the insights of *Pramana Sharir* with modern biometric techniques could enrich anatomical education, clinical practice, and public health strategies. Ayurvedic measurements bring a subjective, qualitative, and constitution-based perspective, while modern measurements provide statistical precision and diagnostic clarity. Together, they can form a comprehensive framework for patient assessment, ensuring both traditional wisdom and modern accuracy are utilized in a synergistic manner. This interdisciplinary fusion holds great promise for developing more individualized, effective, and holistic healthcare models.²⁹

A COMPARATIVE ANALYSIS OF *PRAMANA SHARIR* AND MODERN BIOMETRIC PARAMETERS

Ayurvedic Concept (<i>Pramana Sharir</i>)	Modern Biometric Equivalent	Clinical Application
<i>Anguli Pramana</i>	Finger breadth-based measurements (e.g., limb length, head circumference)	Assesses body proportion, physical strength, and suitability for therapy/procedures
<i>Vaksha Pramana</i>	Chest circumference	Used for evaluating thoracic expansion and respiratory function
<i>Anjali Pramana</i>	Body Surface Area (BSA), Total Body Water (TBW)	Determines drug dosage, fluid requirements, and nutritional planning
<i>Parimana Pramana</i>	Linear anthropometry (height, arm span, waist-hip ratio)	Applied in growth monitoring, nutritional assessment, forensic analysis
<i>Ghaata Pramana</i>	Counting anatomical structures (e.g., number of bones, vessels)	Useful in anatomical integrity checks and congenital anomaly evaluations
<i>Sankhya Pramana</i>	Numerical assessments (e.g., organ systems, vital capacities)	Enables system-based evaluation and holistic diagnostic correlation

CONCLUSION

Pramana Sharir offers a personalized and constitution-based framework for anatomical and clinical assessment in Ayurveda, emphasizing proportion, symmetry, and internal balance. When compared with modern biometric parameters such as BMI, BSA, and anthropometric indices, significant conceptual and functional parallels emerge, particularly in evaluating physical strength, fluid volume, and body proportions. Both systems aim to assess health, predict disease risk, and guide therapeutic planning—*Pramana Sharir* through qualitative, individualized measures, and modern biometry through quantitative, standardized methods. Their integration provides a promising foundation for holistic, patient-centered healthcare that combines the strengths of traditional and modern sciences.

CONFLICT OF INTEREST –NIL

SOURCE OF SUPPORT –NONE

REFERENCES

1. Acharya YT, editor. *Charaka Samhita of Agnivesha*, Sutra Sthana. Reprint ed. Varanasi: Chaukhambha Orientalia; 2011.
2. Acharya YT, editor. *Sushruta Samhita of Sushruta*, Sharira Sthana. Reprint ed. Varanasi: Chaukhambha Sanskrit Sansthan; 2010.
3. Standring S, editor. *Gray's Anatomy: The Anatomical Basis of Clinical Practice*. 41st ed. London: Elsevier; 2015.
4. Hall JE. *Guyton and Hall Textbook of Medical Physiology*. 14th ed. Philadelphia: Elsevier; 2021.
5. WHO. *Physical Status: The Use and Interpretation of Anthropometry*. Geneva: World Health Organization; 1995.
6. Joshi D, Joshi A. *Concept of Pramana Sharir in Ayurveda and Its Utility in Present Era*. Int Ayur Med J. 2015;3(8):2200–05.
7. Khurana JS. *Textbook of Anatomy*. 4th ed. New Delhi: CBS Publishers & Distributors; 2019.
8. Park K. *Park's Textbook of Preventive and Social Medicine*. 26th ed. Jabalpur: Banarsidas Bhanot; 2021.

9. Kundu C. *Pramana Sharira: An Applied Review in Light of Clinical Anatomy*. J Ayurveda Integr Med Sci. 2020;5(2):56–61.
10. Sharma RK, Dash B. *Charaka Samhita*. Vol. 2. Varanasi: Chowkhamba Sanskrit Series; 2013.
11. Tripathi B. *Charaka Samhita with Charaka Chandrika Hindi Commentary*. Varanasi: Chaukhambha Surbharti Prakashan; 2013.
12. Kaviraj Kunjalal Bhishagratna. *Sushruta Samhita with English Translation*. Varanasi: Chowkhamba Sanskrit Series; 2010.
13. Sharma S. *Measurement System in Ayurveda*. J Res Educ Indian Med. 2002;8(3):1–5.
14. Singh R. *Role of Anguli Pramana in the Evaluation of Physical Strength*. Ayu. 2017;38(1):49–52.
15. Tripathi R, Singh G. *Importance of Pramana Sharir in Clinical Practice: A Review*. Ayushdhara. 2018;5(2):1627–30.
16. Bhardwaj A, Gupta V. *Clinical Significance of Anguli Pramana in Ayurveda*. Int J Res Ayurveda Pharm. 2019;10(5):31–34.
17. Patel NK, Bansal R. *Philosophical View of Pramana Sharira: An Overview*. J Ayurveda Med Sci. 2016;1(2):45–49.
18. Sharma PV. *Ashtanga Hridaya of Vagbhata*. Vol. 1. Varanasi: Chaukhambha Orientalia; 2010.
19. Ulijaszek SJ, Mascie-Taylor CGN. *Anthropometry: The Individual and Population*. Cambridge: Cambridge University Press; 1994.
20. Ross WD, Marfell-Jones MJ. *Kinanthropometry*. In: MacDougall JD et al., editors. *Physiological Testing of the High-Performance Athlete*. 2nd ed. Champaign: Human Kinetics; 1991.
21. Malina RM, Bouchard C, Bar-Or O. *Growth, Maturation, and Physical Activity*. 2nd ed. Champaign: Human Kinetics; 2004.
22. Lee RD, Nieman DC. *Nutritional Assessment*. 6th ed. New York: McGraw-Hill; 2013.

23. WHO Multicentre Growth Reference Study Group. *WHO Child Growth Standards*. Geneva: World Health Organization; 2006.
24. Wells JC. *Body Composition Assessment in Infants and Children*. Nutrition. 2005;21(3):247–52.
25. Sahu R, Singh P. *Ayurvedic Anthropometry and Biometric Correlations: A Comparative Perspective*. J Ayurveda Case Rep. 2022;3(1):22–28.
26. Rathi B. *Relevance of Pramana Sharir in Today's Anatomical Study*. J Ind Inst Hist Med. 2020;45(1):10–14.
27. Desai M, Shinde S. *Application of Anthropometry in Clinical Diagnosis and Treatment Planning*. Int J Med Res Health Sci. 2021;10(3):87–92.
28. Bhalerao S, Dole V. *Integration of Ayurvedic Concepts with Modern Health Science: A Need for the Hour*. Anc Sci Life. 2014;33(4):211–15.
29. Sharma H, Chandola HM, Singh G. *Conceptual and Scientific Basis of Ayurvedic Health Principles*. Evid Based Complement Alternat Med. 2011;2011:1–10.