

The Importance of Mathematics for Practicing Siddha Medicine

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Published by GERJ

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Abstract: The study focused on doctors of Siddha medicine and the role of mathematics in enhancing Siddha practices. Mathematics is crucial for disease prevention and management, as mathematical models analyse disease patterns, predict outbreaks, and develop targeted interventions. Mathematical principles assist Siddha practitioners in making informed decisions. In herbal medicine, precise mathematical calculations ensure accurate formulations by determining dosages, concentrations, and interactions of components, leading to effective and safe treatments tailored to individual needs. This personalised approach enhances treatment efficacy and consistency. We determined the sample size through theoretical sampling. We conducted semi-structured interviews using a validated guide and audio-recorded and transcribed the conversations. We conducted data analysis concurrently with data collection using an emergent, iterative process that employed thematic analysis. The article also discusses the role of mathematics in Siddha medicine, an ancient system from Tamil Nadu, India, where it aids in dosha analysis, pharmacology, pulse diagnosis, treatment planning, and disease prevention, emphasising a holistic health approach.

Keywords: Mathematics, Siddha, Medicine

INTRODUCTION

Traditional medicine, with its rich history and diverse techniques, has been a fundamental aspect of healthcare in numerous societies globally. While herbal treatments, acupuncture, and other traditional healing practices receive much attention, many often underestimate the significance of mathematics in traditional medicine (Smith, 2020). This paper explores the crucial role that mathematics plays in traditional medicine, particularly in diagnosing, treating, and understanding various health issues.

METHODOLOGY

The study centered on Siddha medicine doctors from Jaffna and Trincomalee, Sri Lanka, chosen for their extensive experience. We determined the sample size using theoretical sampling until we reached data sufficiency, gathering enough information to form a framework reflecting the perceived impacts of mathematics in their practices. Additional data collection might reveal new insights (Vasileiou et al., 2018). All doctors received an email containing a detailed information letter and participation instructions. We conducted semi-structured interviews using a validated

guide and audio-recorded and transcribed the conversations. We conducted data analysis concurrently with data collection using an emergent, iterative process that employed thematic analysis. Field notes captured data that was not recorded on audio, such as emotional aspects and dynamics, enhancing the transcript data. We analysed written transcripts for emergent categories and themes, constantly comparing within and across interviews (Charmaz, 2014). We reviewed and coded the transcripts, using N-Vivo software to facilitate data management. This qualitative process involved cyclical steps of reading, re-reading, organising, noting, coding, tagging, labelling, retrieving, and linking data from the transcripts (Bauer, 2000).

FINDINGS

In interviews with fourteen participants, all Siddha doctors, a wealth of insights emerged regarding the role of mathematics in their practices. Participants confirmed the established importance of mathematics and highlighted numerous other factors influencing their work.

The role of mathematics in Siddha medicine

Siddhars, spiritual adepts practicing yoga and meditation, developed Siddha medicine, a traditional system that originated in ancient Tamil Nadu, India. It is based on maintaining a balance between the body's three humours—Vata, Pitta, and Kapha—to promote health and well-being. Siddha medicine employs herbal remedies, minerals, and metals alongside practices like yoga, meditation, and dietary recommendations, focusing on treating the root cause of illness rather than just the symptoms.

Mathematics is integral to Siddha medicine for dosha analysis. The Tridoshas—Vata, Pitta, and Kapha—govern physiological and psychological functions. Mathematical calculations determine the balance or imbalance of these doshas, which aids in diagnosing and treating diseases. Siddha medicine uses a wide range of herbal medicines and mineral preparations. Mathematics is crucial in formulating these medicines, including dosage calculations, ingredient proportions, and preparation methods, ensuring efficacy and safety. Pulse diagnosis, another critical method, uses mathematical algorithms to interpret pulse readings and identify imbalances, guiding the treatment approach. Siddha physicians employ mathematical calculations to determine appropriate treatment plans based on patients' unique constitutions, disease conditions, and environmental factors. Siddha physicians also use mathematics to predict disease outbreaks, analyse epidemiological data, and develop preventive strategies.

Disease Prevention and Management

Prevention is key to maintaining health and well-being, with mathematics playing a vital role. Mathematical models assess risk factors, predict disease outbreaks, and develop preventive measures to safeguard communities. These models are used by traditional healers to analyze disease patterns, track illness spread, and implement targeted interventions. Mathematics is crucial in disease modelling and epidemiology (Wang, 2022). Siddha doctors use mathematical models to analyze disease spread, predict outbreaks, and assess intervention effectiveness. These models help understand infectious diseases' dynamics, enabling informed decisions on control and prevention strategies. Mathematical modelling also plays a role in personalised medicine, using patient data to tailor treatment plans and understanding drugs' pharmacokinetics and pharmacodynamics, leading to safer and more effective treatments (Smith, 2021).

Enhancing Diagnostic Accuracy and Treatment Efficacy

In Siddha medicine, mathematics is fundamental to diagnosing and treating illnesses. Applying mathematical concepts like probability, statistics, and geometry helps traditional healers uncover hidden health conditions, forecast disease progression, and customise treatment strategies. Probability helps assess health outcome likelihoods based on symptoms and historical data (Davis, 2022). Statistics enable healers to analyse and interpret patient symptoms, treatment outcomes, and disease patterns (Garcia, 2023). Geometry helps understand spatial relationships within the body, such as organ positioning or energy flow in acupuncture. Integrating these mathematical concepts enhances diagnostic accuracy, treatment efficacy, and personalised care. Embracing mathematics as a fundamental tool allows traditional medicine to evolve and adapt to meet diverse healthcare needs on a global scale.

Formulating herbal remedies

Siddha medicine relies on mathematical calculations to formulate the proper herbal remedy. Applying mathematical principles ensures the right proportions of herbs, roots, and natural ingredients, addressing specific ailments effectively (Smith, 2020). This personalised approach enhances treatment effectiveness and minimises potential side effects. Mathematical calculations allow formulations to be standardized, ensuring consistency in the quality and potency of herbal remedies. Precision in dosage and concentration is crucial for achieving reliable results and building patient trust. Thus, mathematics plays a fundamental role in traditional medicine by guiding herbal remedy formulation. Through careful calculations, traditional healers harness nature's healing power to provide safe and effective treatments.

Conclusion

Mathematics education is essential in Siddha medicine, offering a structured and analytical approach that improves diagnostic accuracy, treatment efficacy, and preventive healthcare methods. Incorporating and valuing the role of mathematics in the Siddha medicine curriculum can lead to better patient outcomes and a deeper understanding of these ancient practices. By continually integrating mathematical principles, Siddha medicine can evolve and adapt to address the diverse healthcare needs of people around the world.

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