



## Review Article

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### FUNDAMENTALS OF AYURVEDIC RESEARCH METHODOLOGY WITH ITS NEED, SCOPE AND FUTURE CHALLENGES: A REVIEW

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#### ABSTRACT

*Ayurveda*, the ancient system of medicine, whose antiquity goes back to Veda has a divine origin and has thrived since time immemorial basically due to its strong, scientific and undeniable fundamental principles. *Ayurveda* mainly aims at removing the root cause of the disease rather suppressing the symptoms and to find the root cause of a disease, Acharyas espoused the fourfold tools of examination or investigation referred to as *Pramana*. These methods employed in *Ayurveda* have to be illustrated and elaborated with the tools that augment its utility and efficacy in the contemporary medical science. The future prospects of Research in *Ayurveda* depend on the knowledge of the skills and scientific reasoning which relies on the outcome of fundamental research in *Ayurveda* that aims to refurbish the traditional approach still enduring in the realm of the basic principles and studying them with the scientific approach based on the objective parameters. The aim of basic research in *Ayurveda* is exploration and development of scientific concepts and theories mentioned in the classics with the necessary amendments made wherever desired, keeping the fundamental principles intact. Thus, the challenge is to make *Ayurveda* in parlance with the contemporary progressive sciences through systematic research activity.

**Keywords:** Research, *Ayurveda*, *Pramana*,

#### INTRODUCTION

*Ayurveda*, the science of life and the known traditional and conventional system of medicine has thrived since time immemorial, mainly due to its undeniable and scientific fundamental principles. It is of great significance to realize that *Ayurveda* is not just confined to medicines alone, but it tackles the whole concept of life in its various ramifications. The fundamentals of this science of life are to be understood and implemented in such a way so as to attain the utmost target of promotion and maintenance of health and cure from deadly diseases.

In the present era of science and technology, globalization is taking place in almost every sector of the society. Every discipline of knowledge has started expanding its dimensions. The inquisitiveness of a man has motivated him to acquire new and captivating knowledge, tools, techniques and procedures in the area of their own interest which is improvising their thinking process from macro to micro level.

Necessity is the mother of invention. This quest of knowledge through diligent search or investigation or experiment aimed at discovering of new knowledge is nothing but research.<sup>1</sup> Research based knowledge is the key for expansion and development in the scientific world. The phenomenon of research is not new to *Ayurveda*. Research has been as old as the human tradition. The classical texts of *Ayurveda* are full of direct and indirect references suggestive of research activity. There are various words synonymous with the word research in *Ayurvedic* compendia mainly, *Anusandhana*, *Anveshana*, *Gaveshana*, *Pariksha* and *Shodha*.<sup>2</sup> These words are of great significance as they denote proximity of the research activity with the society. The research methodology of the classics and the contemporary

methods of research differ at various levels which needs to be pondered over and the acceptable solution be searched.

It is obvious from the facts that the whole world is inquisitive towards alternative systems of medicine as a possible remedy to ever increasing menace of the resistance against antibiotics used non-judiciously in today's medical practice. This expectation of the ailing world can be met through a sincere and devoted research activity in the traditional and alternate systems of medicine alike *Ayurveda*.

#### Classical methods of Research

The glorious past of research methodology of *Ayurveda* is based on the tools of examination called as '*Pariksha*' mentioned in *Sutrasthana* of *Charaka Samhita* and is inspired from the philosophical term '*Pramana*' denoting the proof or the evidence or means of investigation.<sup>3</sup>

These tools of examination include:

- Pratyaksha* (Direct observation / Perception by senses)
- Anumana* (Logical inference)
- Yukti* (Logic)
- Aptopadesha* (Authoritative testimonies).

The modern-day research also depends on these four basic tools whose efficacy has been augmented by the utility of scientific and innovative devices that provide objectivity to subjectivity, which is the primary aim of Research. These means of investigations have been devised to develop the backbone of *Ayurvedic* system in the form of fundamental principles under the broad perspective of Fundamental research. It is the need of the hour that the *Ayurvedic* principles must be proved in the scientific light that

expands the knowledge vistas to the untraded path of medical science.<sup>4</sup>

#### A. *Pratyaksha*

The *Pratyaksha* or the direct observation pertains to the knowledge gained by the senses directly with the object. Color, shape, size, luster and other visual objects can be examined with naked eyes. Similarly, we can increase the capacity of different sense organs with the help of mechanical aids like Eyes supported by microscopes, endoscopes, etc. tactile sensations of skin supported by thermometers, pulse oximeter, clinical hammers and stethoscopes.

#### B. *Anumana*

Sometimes, having an important method of clinical examination with visual aids doesn't prove fruitful and we take the help of logical inferences which acts a link between the cause and the effect and accomplishes the target of research. This is called as *Anumana*. For instance, while testing the joint swelling in Arthritis, we can access the swelling with the help of measuring tape (*Pratyaksha*), but when accessing the overall improvement, we ask the patient to walk and determine whether the patient is able to walk without any support or pain which signifies our *Anumana* or inference showing the efficacy of the anti-arthritis drug.

#### C. *Yukti*

*Yukti* is nothing but the conclusions drawn on the basis of *Pratyaksha* and *Anumana*. It is similar to *Anumana* but the only difference between them is that *Anumana* is related to a single object or single process whereas *Yukti* has a multi-dimensional approach. It is very useful while conducting a drug research. For example, a single drug can be used for multiple disease conditions by modifying its intake modalities. *Triphala* alone can be used for reducing obesity but *Triphala* along with honey and lukewarm water can reduce obesity more abruptly.

#### D. *Aptopadesha*

It forms the foundation of all means of investigations. Every research begins from an existing knowledge. This is why pre-review is the demand of every research. Whatever is seen (*Pratyaksha*) or concluded by logics and inferences has a plinth of existing knowledge which is called *Aptopadesha*.

Apart from these basic tools of examination, *Panchavayava Vakya* [Fivefold statement for establishment of facts] is mentioned in *Vimanasthana* of *Charaka Samhita*.<sup>5</sup>

These are:

- Pratidnya* – It is the statement of the problem or hypothesis which is to be proved.
- Heitu* – The logical reason or the rationale behind the research.
- Udaharan* – Illustrative examples or instances, if present resembles the things which are to be proved.
- Upanaya* – Comparison or correlation of examples with the problems giving logical sequence to upcoming steps of research.
- Nigaman* – Conclusion

In this way, any hypothesis is logically presented and firmly established or rejected with the help of *Panchavayavavakya*. The same methodology is carried out in Modern researches as well which includes prior establishment of a statement or hypothesis

(*Pratidnya*), then plan of work is made followed by collection of data with the help of examples (*Udaharan*), assessment of observations of results (*Upanaya*) obtained using statistical means and appropriate confidence limits and at last conclusion of the facts (*Nigaman*).

Prior to the commencement of any research activity, the seers have advised the tenfold examination again mentioned in *Vimanasthana* of *Charaka Samhita* which covers all the aspects of a research.<sup>6</sup>

These topics of examination are:

- Kaarana***– It signifies the scholar who pursues a research activity. The research scholar should essentially possess the qualities of perseverance and hard work apart from the gross knowledge of the concerned subject.
- Karana*** – These are the tools or instruments used by the researchers in his due course of research procedure.
- Kaarya yoni*** – The essential cause or source of the problem which has transformed into a topic of research or an investigation.
- Kaarya*** – The aim and objectives which are expected to be achieved by the researcher.
- Kaarya fala*** – The immediate result and the effects produced by the research activity.
- Anubandha*** – The contribution bound to be associated with the researcher in both positive and negative sense.
- Desha*** – The area or the place undertaken for research activity.
- Kaala*** – The stipulated time period of research activity.
- Pravritti*** – It is concerned with the initiation or the efforts undertaken by the researcher for his/her project.
- Upaaya*** – It signifies the methods or the plan and involves maximum utilization of funds and resources.

This tenfold examination ensued for pursuance of any research activity decides the due course of action for rectification of any shortcomings of research.

#### Objectives

Fundamental research should be focused at

- Developing globally acceptable new standards and parameters for understanding of *Ayurvedic* concepts and its better application.
- Establishing *Ayurvedic* methods for evaluation of treatment modalities according to presentation of a disease. (*Awasthanurup Chikitsa*)
- Exploring possibilities of meaningful correlations of *Ayurvedic* concepts and modern scientific discoveries.
- Re-establishing the relevance of *Ayurvedic* principles in current and forthcoming generations using recent advancements and tools.
- Understanding the limitations and obstructions of the use of modern clinical research methods in *Ayurveda*.

#### Lacunae in *Ayurvedic* research

- Non-establishment of methods/framework/study design to explain the basic concepts and fundamental principles of *Ayurveda* with modern prospect.
- Inadequacy of measurable parameters for assessment of *Doshas* and *Dhatus* as these controlling forces don't render themselves to be measured manually.

- Hidden truths or implicit and controversial words with same connotations but different meanings are found scattered at many places in the texts.
- Unique Concepts of *Panchamahabhuta, Rasa, Virya, Vipaka, Guna, Karma* and other unexplored fundamental topics of research in *Ayurveda* have remained non-validated and unjustified with respect to the needs and demands of present generation researchers.
- Difficulty in conducting Randomized control trials to prove the exact efficacy of a drug by overcoming placebo effect through *Ayurvedic* drug research because *Ayurvedic* management emphasizes on Tailor-made treatment.
- Scarcity of Inter-disciplinary and Multidisciplinary approach to prove *Ayurvedic* facts in the field of research.
- Shortfall of globalization of *Ayurveda* and poor industrialization of *Ayurvedic* drug sector which requires standardization and quality assurance of in-use drugs.

#### Strategies to overcome challenges faced during conduction of Research

- Globally acceptable new standard parameters and new research strategies should be adopted for understanding and implementing the basic concepts of *Ayurveda*.
- Advanced and innovative medical instrumental technologies should be used for assessment of *Doshas, Dhatus* and other measurable *Ayurvedic* entities.
- Revalidation and justification of fundamental *Ayurvedic* concepts is necessary and should be done through appropriate clinical and experimental methods by use of various scientific instruments and techniques.
- Multidisciplinary research approach should be accepted mainly focusing on incorporation of *Ayurvedic* principles with those of contemporary sciences.
- Standardization of *Ayurvedic* diagnostic and treatment protocols should be done by in situ research studies and documentation of such clinical trials would prove more beneficial.
- Interactive training programs and orientation courses should be initiated in this direction for better understanding of potential fields of biomedical research like Cell biology, Immunology, Histopathology, Neurology, Endocrinology, Human genetics, etc. as these may result into an interdisciplinary approach of researches in *Ayurvedic* principles.
- Acceptance of 'Reverse pharmacology' approach to drug evaluation along with additional therapies based on the holistic approach could help restore the recognition of *Ayurveda's* validity as a system of life and health science.<sup>7</sup>
- Transforming *Ayurvedic* research methodology using the 'whole system testing approach' which requires global participation with protocols evolved through intense interface with the modern science.

#### DISCUSSION

Metamorphosis of *Ayurveda* by consolidating it with modern and scientific technologies, keeping its fundamental principles intact is a promising and challenging approach requiring greater insight and in-depth knowledge in the field of *Ayurveda* and intellect sustained with modern contemporary sciences. Catering to the demands of the society and medical fraternity, modern scientific research has been initiated in *Ayurveda* in the field of Fundamental principles. The aim of research in *Ayurveda* is exploration of scientific innovations and opportunities in fundamental notions of *Ayurveda*. The fundamental research is

inclusive of replacement of faith and suppositions with the scientific reasoning acclaimed with facts and figures.

Dr. Gopal Bashistha, a Senior Rheumatologist in USA has been working in the direction of rewriting *Charaka Samhita* by assimilating innovative modern techniques in it.<sup>8</sup> The surgeon professor M.S. Valiathan initiated ASIA (A Science Initiative in *Ayurveda*) as a fresh approach to the scientific validation of *Ayurveda*, which attempts to validate key concepts that exemplify *Ayurvedic* thinking to newer heights.<sup>9</sup> Such novel and skillful projects are much needed in the present era or else *Ayurveda* will be veiled by the curtains of Modern Herbal researches. Every now and then newer diseases are being identified, explored, narrated and introduced in modern sciences. Scientists and Researchers are able to investigate the cause and formation of such diseases reaching its cellular or molecular level. But when there raises the question of *Ayurvedic* science, we need to consider the fundamental principles to form the pathophysiology of the disease thereby formulating the treatment protocol which can be either *Shodhana* or *Shamana*. Merely using herbal preparation, justified on the basis of modern research will not be much beneficial in that case.

Therefore, amplification of *Ayurvedic* fundamental principles by integrating it with modern investigative tools to formulate a pathogenesis from an *Ayurvedic* perspective is much needed. It is of utmost importance to standardize the fundamental diagnostic principles subsuming it with contemporary investigative techniques and its utilization for attaining an easy and manageable diagnostic as well as treatment protocol which may help the forthcoming younger generation in solving the issues and challenges in understanding newer diseases using *Ayurveda*. Modern science has remarkably developed with the amalgamation of technologies in the field of diagnostic, prognostic and curative procedures. New, unconventional and unprecedented technologies are being daily introduced for a meticulous and explicit understanding of humans and the diseases.

#### CONCLUSION

From the above discussion, it seems apparent that there is a need of research in *Ayurveda* to help the ailing population with an alternative remedy against the existent, indiscriminate and spurious use of malicious antibiotics. Science evolves through a rigorous and continuous research process. Research and *Ayurveda* go hand in hand. There is a lot of scope of research in *Ayurveda* including the fundamental, literary, drugs, clinical and therapeutics. Keeping the fundamental principles intact, it is obligatory to pursue scientific research in this oldest system of medicine still prevalent, practiced and followed by millions across the globe. *Ayurveda*, the conventional and traditional system of health, care and longevity needs to be validated on modern scientific research methodology taking care not to compromise with the basic tenets and its philosophy.

This paper brings into insight the illustrious past, challenging present and the proficient future prospects of Research in *Ayurveda* with special reference to fundamental research. Research has always been an innate and constitutive part of this traditional but perpetual science which has kept it alive and now is the need that *Ayurveda* establishes its scientific base through researches in the basic principles which ensures that *Ayurveda* gains a place of pride and honor in the galaxy of contemporary sciences.

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