

Globalizing Ayurveda - Opportunities and Challenges

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ABSTRACT

Though the prevalence of ethnic medicines is active around the world, Āyurveda with its philosophical and conceptual background thrives less hard to incline all towards it. Though the principles of Āyurveda are immortal, it's the need to be contemporary marking up to the current scientific trends together with the integration of technologies and propagating Āyurveda to the mainstream globally. The present review article discusses the possibilities of bringing resurgence to Āyurveda and also elaborates upon the challenges and solutions to meet the International standards and accept it globally as a mainstream health profession from a beginner's point of view. With growing interests and acceptance, eventually marking its place among other licensed health care professions globally, advanced visions to focus on the formal scopes of global competitive marketing sectors should be promoted in order to reap its future prospects in the global economic front concurrently and this is inevitable. Moreover Drastic revisions on Āyurveda Epistemology, minimum standards & requirements of statutory bodies, planning commissions, culminating the serious flaws existing in the graduate level Āyurveda education and upgrading & strengthening existing R&D institutions through vertical integration & clustering of related bodies, and other endowments adding to its viability should be in forefront of amendments. Well structured and concrete collaborations across nations via MoU will also have an impact on implementing its soft power globally. Thus Āyurveda in the current global trend proposes a different approach towards the nurturing & globalization, making it marginal and adaptable in the international scenario.

Keywords: Āyurveda, Review, Globalization, Epistemology, MoU

INTRODUCTION

The present article is a review report in an attempt to revive and discuss upon the possibilities of bringing resurgence to Āyurveda, taking into consideration the past and the present scenario, for its better implementation, together with the integration of technologies¹ in order to Āyurveda to mainstream globally. Āyurveda being one of the ancient extant of health care, with a profound scientific background of efficiency, faces a paradigm shift² at different levels dealing with philosophy,

Research and Development, statutory and planning body commissions, administrative and republican horizons. Even other axials like technological interventions and advanced areas of Āyurveda and Artificial Intelligence is eventually aimed at its focal scopes on global forefront concurrently. For better conceptualization regarding the focal scopes of Āyurveda, it is inevitable to trace back some of the cites of contestations and impacts that it has proposed, revised and followed right after the colonial period, towards the concurrent modernization and

industrialization of Āyurveda. Thus it is very evident that India has seen a major setback during the British era³, with a significant erosion of its traditional health practice, downgrading its status to be one of the subsidiary medicines. Āyurveda during the colonial period has also faced a global challenge in the domestic marketing sector, making it more rudimentary in the global economic forefront.

Thus evolving out from such a major crisis, the questions on global recognition of Āyurveda cannot be effectively tackled up without assessing to its basic foundations, since this is going to be the most referral points towards globalization. Now it's the need of the hour, to have an immediate self retrospection regarding the Indian scenario and the primary points to be scrutinized are the prevalence of Āyurveda through traditions, whether it is considered as a subsidiary medicine or mainstream medical system, its credibility as a traditional system of medicine considering the philosophical background and the indigenous aspects of study and practice, its sustainability in present health scenario, global marketing strategies adapted in the promotion and practice of Āyurveda and its drugs, its detrimental effects in the philosophy and ethics of Āyurveda, transparent Research and Development works and its rational validation and credibility factors. The precise validation to these queries is vital enough to transmit an appropriate message in signaling the global acceptance of Āyurveda.

How so ever, the attempts to revive Āyurveda, even after dominant discourses of colonialism, sought to develop right from the second half of nineteenth century. In concern of the global economy, the real confrontation for Āyurveda lies in the axials of defining the terminologies and formal parameters of its literature abundance capable enough to restructure the current Āyurveda potential and its adaptability. The recent up gradation of International Classification of Diseases [ICD – 11] by World Health Organization with the

acceptance of 11th revised proposals in classifying traditional medicine for the first time has a very significant role in contributing to the globalization of Āyurveda⁴. This inclusion of AYUSH terminologies in ICD-11 will enable counting and comparing of medical conditions, proving means for doing research and evaluation to establish efficacy and safety of traditional Medicine.

The exponential growth of globalization, particularly when the major economic development of a county has its dependency on Industrialization, the sectors of traditional health care systems was least bothered despite their potential to contribute towards growth of GDP and foreign exchange. The growing eco-friendly concerns, mainstreaming of herbal industry was in the forefront of sustainable and successful enterprise. Regardless being a distant dream in the past scenario, India has raised as one of the largest economy in the world in terms of Purchasing Power Parity⁵. In the current global trend, Āyurveda and other indigenous systems of medicine has been officially recognized and brought under AYUSH, holding a major share in addressing public health challenges through evidence based integrated practices. The overall governance and regulations is to promote and patronize the working structure of various educational institutions, hospitals and its collaterals and the registered medical practitioners. This outreach was made possible in support of several autonomous bodies via, research collaborations, Policies, IT induction and various other professional councils, national institutes and even through academies.

India with a significant annual turnover⁶ in herbal marketing industry, has also witnessed certain other situations that has precipitated to face number of challenges. If this trend of unsolved challenges in areas of quality, processing, administrative and infrastructure related biases, pharmacovigilance, clinical trials, biopiracy, R&D, and other unethical practices of herbal medicine goes unnoticed,

it engrosses the growing complexity of overall economic progress of the science. So this article dealt up on mainly a Meta analytical review on limited opportunities, the challenges and few of the solutions required for globalizing Āyurveda, from a beginners point of view.

The focal points of discussion of the article aiming at globalizing Āyurveda are as follows:

- ❖ Āyurveda Epistemology
- ❖ Āyurveda Educational System
- ❖ Ayurveda Herbal Marketing Scenario
- ❖ Āyurveda Research & Development

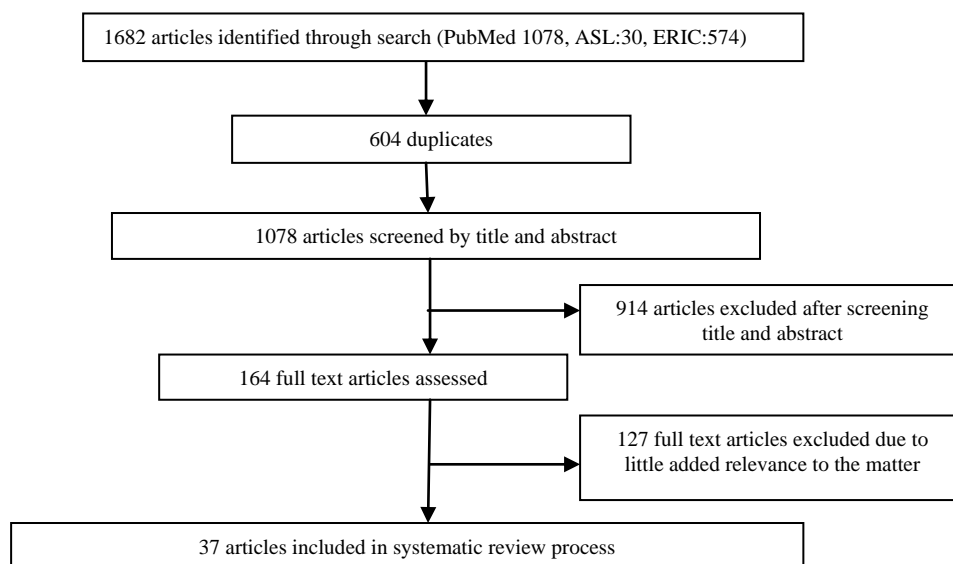
METHODOLOGY

The current article is a review study with proper systematic literature review containing studies that were published in the following databases: PubMed 1078, ASL:30, ERIC:574. This article also follows a protocol that will be in accordance with the PRISMA⁷ (Preferred Reporting Items for Systematic review and Meta Analysis) guidelines, in order to structure the overall contents of the detailed review process. The

article has incorporated comprehensive searches from the database using the keywords: Globalization, Āyurveda, Opportunities, Challenges, Solutions, Traditional Medicine, Herbal Medicine, Scopes and other related terms. The search terms were made broad and diverse in order to ensure the accessibility of all potential articles for inclusion in this review study.

The titles and abstracts of the articles were screened from the electronic search and those articles with ample and sufficient information regarding the keywords were only considered under the inclusion criteria and several articles were excluded based on their insufficient information, irrelevant data and even repeated ones were ruled out and the final workflow chart has been detailed in Figure1. The search has also comprehended almost all the indexed journals, reference list of relevant articles bibliographical studies and all other computerized databases. Results from the search engine were limited to full-text articles that were published from the available dates through 2018 and those in English language.

Figure 1:



The strategy executed for this systematic review and meta analysis has underwent a detailed search engine screening and this has identified 1682 articles, including 604 duplicate publications. Further screening of this data,

on the basis of titles and abstracts retrieved much more comprehended data's of 164 full-text articles. After a final round of review, only 37 studies were found to be relevant and up to the matter and were included in the final analysis. For further

information regarding the flow of studies adapted throughout the review refer Figure 1.

OBSERVATION

ĀYURVEDA EPISTEMOLOGY:

With advancements made in the contemporary science, the research based intellectual activities have been successfully persuaded. Āyurveda being the indigenous system of health and medicine, in quest of knowledge has strong tenets of Indian philosophy that has laid foundation in terms of its fundamental and basic principles. Thus the fundamentals of the research methodology would be certainly highlighting the significance of Indian philosophy and Sanskrit language promulgating epistemology as a tool of validation. Prior to detailed discussions on the role of Āyurveda epistemology towards globalization, it's the need of the hour in validating its challenges and in short the validity of the concept. In the current scenario of advanced science and utilities, it absolutely erodes off any uncertain faiths or principles followed since traditions; rather it has been replaced by skepticism⁸. In fact the contemporary need of research focuses only on to the absolute truth established by the unbiased experimentation and systematic analysis for thorough validation of the concepts. Thus a number of times the methodically evaluated facts in the scientific light have gained queries on its validity and authenticity in the changing scenario. This has lead to the re-evaluation of current Āyurveda philosophies and fundamentals in the light of modern scientific parameters so as to accept its concepts and tenets as per the need of time. Thus a progressive, dynamic and yet continuous updating is very much essential, so as to move in tandem with the contemporary science, in support of tools of examination which are authoritative and reliable testimonials in pursue of research updating. Thus epistemology stands to be the base for the advancement of scientific reasoning through utilitarian experimentation and analysis.

The Indian philosophy, with strong and exact deliberations has valid examination of these scientific queries. Thus the science which always seen progress by means of reductionist approach has started waning its authenticity and validity right after the experimentations and observations of quantum physics were promulgated. And towards the end of twentieth century, theory of holism and theory of philosophy has gained importance in light of loss of significance of theory of reductionism. And through the lights of above mentioned concepts, it has sketched the landscape of foundations in a holistic manner to discuss and re-evaluate upon the existing knowledge on conceptual as well as pragmatic aspects of the research methodology.

Theory of holism focuses on a broader landscape, the universe and is often associated in terms with Indian spirituality⁹. It is because of this fact that certain science has began to sprout nevertheless the challenges compromised their initial progression. As these tenets and concepts transcends excellence, those views has gained importance worldwide and the similar notions were also found to be echoed in other parallel sciences like Chinese medicine, Āyurveda, yoga and even Indian spirituality adding to its worldwide acceptance. Now emphasizing the fact that 'the whole is greater than the sum of its parts' contemporary science should focus on the integration and relationships and should see the system as integrated wholes, although it is possible to discern individual parts in any system. Thus it has successfully arrived at a paradigm shift from reductionism and holism and also drawing concepts from the Quantum Mechanics Theory, it has even conceptualized the differences between reductionism and holistic paradigm of health¹⁰. Thus the aforementioned concepts on holism has its own significance in concreting towards the indigenous systems of medicine as mainstream health paradigm adding to the health index of the society, since this

appears to be more promising. However with the changing environment and advancements in science and technology it is mandatory to re-evaluate and validate the presumed facts through scientific research methodology that renders to fulfill all the parameters mentioned in classics.

Apart from all these, there evolved certain magnitude of challenges in quest of this knowledge. With the gaining importance in Āyurveda epistemology worldwide¹¹, a proper knowledge on Indian philosophy and Sanskrit language turned to be mandatory since the real essence of this can only be understood with thorough knowledge of Indian philosophies and with a proper fundamental background. Also there occurs a shift of paradigm in the so obtained knowledge gained through theory of reduction. This advancement enveloped by the theory of holism has brought a shift of perseverance especially in the philosophical concepts due to difference in the intellectual acceptance and understanding of different people. This has given rise to vast and widespread propagation of theories in the name of Āyurveda epistemology which in real was proved to be absolutely insignificant and was well deviated from what it really is and what it really tried to convey. As a part of this propagation, Āyurveda was then entitled to preoccupy only as a mere herbal medicine or massage therapy for at least some period of time. Thus to understand the theory of holism or phenomenon of human biological functioning and its universal linkage and interaction, there emerged many centers but this was only studied and propagated in all its essence and validity by few genuine Āyurveda centers of excellence throughout the nation. Thus in order to overcome all these challenges and to popularize Āyurveda, there evolved certain works concentrating up on the translational works of all Āyurveda literatures to regional languages for better understanding, alongside identifying and translating all other related sciences like Indian philosophy and even spirituality for better

understanding of this non linear health care system having a multi pronged holistic approach. Through such translational works the existing knowledge was updated and was better promulgated than earlier. It was also noticed that when a phenomenon or tenet was tried to understand and approach under the modern parameters, the knowledge so obtained was tend to be incomplete and when the similar concept was viewed through the principles of holistic concern, it was better understood but there still prevails some vague notions and incompleteness of knowledge and it is at this context we should reconsider and re-evaluate all these basic principles. So in the present scenario, there should be an interface so that the two parallels explaining the same phenomenon should have a communication between both the theories of holism and reductionism. Only on interdisciplinary understanding between these two streams we could arrive at the common lacuna's and bring areas of translational researches, interdisciplinary researches and multidisciplinary researches getting incorporated into Ayurveda Epistemology for avoiding the misinterpretations and such other mutually contradicting theories towards globalizing Ayurveda. Thus a well distributed and detailed knowledge on theory of holism and theory of reduction should be assessed and analysed prior to any research methodology.

ĀYURVEDA EDUCATIONAL SYSTEM

Āyurveda as an ancient system of medicine has imparted knowledge for at least 5000 years and perhaps as long as 10000 years in preventive and curative medicine. The time honored traditional medicine was preached under Gurukul system until the mid twentieth century¹². But the post colonial period evokes a major transformation and has witnessed advanced reforms in the educational sector¹³ under the initiative of various committees and this has lead to a setback in Gurukul system of education. It is from then Āyurveda educational system started facing challenges compromising the benefits from culminating

in to a skilled physician out of choice. Today, India has officially recognized Āyurveda and other systems of indigenous medicine along with modern medicine and in order to patronize and promote these systems, government of India has even established a separate department which is now known as AYUSH¹⁴. Āyurveda being one of the major share holders in AYUSH in terms of infrastructural facilities, it has faced major challenges and setbacks in educational sector and this is monitored by central council of Indian medicine. Even after imposing various norms and regulations, the current standard of Āyurveda education is still under concern that requires immediate reconstruction. In the present scenario with a surplus range of graduates passing out from around 300 Āyurveda colleges in India, the first and foremost initiative should be to impart and improve the quality of Āyurveda education in India, with appropriate training and certification even in contemporary biomedical subjects like biochemistry, pathology, pharmacology, emergency medicine etc irrespective of their stream. Currently India follows a parallel medical stream segregating Āyurveda and portions of modern biomedicine¹⁵. This integration in terms of practice and education may be the most important reforms towards globalizing Āyurveda and by this means of bilateral education; Āyurveda can even prove its scientific as well as pragmatic throughput even in major areas of unexplained medical related topics adding to the magnitude of successful conclusions over various medical research. But the existent flaws of current educational trend in molding a confident physician is still under concern and taking this in to consideration, active educational reforms should be made in terms of skilled quality and knowledge.

The undergraduate levels of Āyurveda education should be reformed to more disciplined schedules in exploring the basic skills of students in diagnosis, Panchakarma and other paramedical procedures since this has a major role in

supplementing to the primary health care delivery system of our nation. Thus strict implementation of regulatory norms over these curriculum based reforms should be made along with rigorous training in theoretical knowledge and appropriate basics on to research methodology. Also workshops providing detailed knowledge on investigatory tools like ECG, X-Ray, USG, etc by experts in the field should be made compulsory since ancient diagnostic techniques and ambiguous knowledge on these techniques remains inadequate in directing to the final outcome of the whole diagnostic process. Also well disciplined training in areas like focal scopes of research, genetic counseling, lifestyle disorders, preventive and social health care, immunology, drug and alcohol abuse related emergency care and other social health issues concurrently evident in the society according to situations. Well qualified physicians in these branches of concern could better drive the potential health related harms of the society in aid of better infrastructural facilities, confidence and willingness to do the same. Another major throughput of suggestion will be establishing in situ studies and developing proper tools of documentation in areas of research, practice and case recording, for better standardization of Āyurveda diagnostics and treatment protocols to an extent. It is at this context the principles and philosophy of Āyurveda should be scientifically validated by means of holistic nature so as to define the common lacunae's existing in theoretical, practical and research paradigms. Thus it's the need of the hour for a mutual collaborated studies and researches from bilateral medical streams on scientific as well as holistic basis. Thus a well structured theoretical as well as pragmatic foundation is very much necessary in bringing paradigm shift to the current magnitude of challenges.

Āyurveda education should also lay great emphasis on public health, maternal and child health care. Further setting up of centers of excellence for Visha Chikitsa,

Marma Chikitsa, Lifestyle Disorders management, and other debilitating and devastating conditions should also be considered by the ministry to address the urgent need for its great attention and also the relevance of mainstreaming Āyurveda comparing other systems of medicine to meet the current global trends and interests through resource allocation, excellent governance, and management. The curriculum of Āyurveda system should maintain the minimum standards of education as per the provisions. Thus the center should also strike at the grass root levels of reasons attributing towards the unsuccessful molding of competent and confident Āyurveda graduates. Although there were appreciable initiatives aimed at reforming Āyurveda education, it has never opened a new gateway towards globalizing. Another major challenges faces by the Āyurveda educational sector are lack of minimum standards of requirements in terms of infrastructure, skilled teaching faculties, documentation, pragmatic training and even job opportunities, which are under lobbying process and even the mushrooming of substandard Āyurveda colleges should be prevented in order to maintain the quality of AYUSH infrastructure. Thus prompt measures should be forwarded in resolving these issues to up-bring a platform enriched with professionally skilled and dedicated candidates towards better future of Āyurveda. Thus strict implementation norms should be laid out while granting approvals for Āyurveda educational sectors in terms of minimum standards of requirement and compulsory norms on NABH accreditation processes towards better globalization of Āyurveda. Moreover unbiased screening of eligible categories of students and lectures on merit basis, limiting or exclusively debarring the management and NRI quotas from academic topography should be carried out to maintain the dignity and essence of science. Well balanced periodical and unbiased assessment and accreditation by any center based

organization should be made mandatory to ensure the quality and working of approved institutes. Appropriate reforms wherever necessary in the policy model should also be made by the active underlying panel members of the center organization under strict reviews and channelizing them via proper methodologies towards better acceptance and active implementation. Thus ruling out all the possible challenges regarding the educational sector could better be aimed at ensuring transparency and thereby improving the quality and functioning of AYUSH colleges. Furthermore signing of Memorandum of Understanding with several stakeholders includes several ministries and Nations for disseminating benefits inculcating the philosophical as well as pragmatic excellence of our science along with expanding AYUSH Services to other sectors of the Nation like Defense, Railway will also add to its soft power globally.

ĀYURVEDA HERBAL MARKETING SCENARIO

The exponential growth of herbal marketing sector, has tend to be increased due to increased concerns on personal well being and increased awareness on adverse effects of indiscriminate synthetic drug usage¹⁶. This renewal of interest ever since the last few decades has added to the rapid expansion of herbal marketing sector, necessitating increased demand for medicinal plants¹⁷. Also the resurgence of public interest in eastern traditional medicine in providing cure to various dreadful diseases, has also gained its acceptance all over the world when allopath have failed to bring a notable change in such devastating conditions. This increased demand and over exploitation of existent population has even questioned the existence of rare species herbal population¹⁸ and the conservation of this natural heritage has turned to be of paramount urgency. The extinction rate of several rare herbal species due to illegal trade, human activities and other developmental projects deteriorating the environment has also accelerated to the

current rate of genetic erosion¹⁹. Thus in the long run, we could even expect a demanding situation of herbal drugs from other nations, though actually India is being claimed as the world's oldest as well as largest traditional systems of medicine adding to its total annual turnover.

Scarcity of herbal drugs could even cripple the status of production, adversely affecting the business as well as the quality of end products. At this point manufacturers will be forced to buy substandard qualities of raw products and that too at fairly double prices. Moving deeper onto the seriousness of this crisis, drug scarcity will even lead to the non-availability of good quality and quantity of raw materials at the right time, obviously which will have to face a considerable rise in its price and this price hike in no doubt would affect to the total sale of the small and medium scale industrial firms, questioning their survival. Wherein the mean time most of the manufacturers would be forced to concentrate upon the production of certain formulations that could be prepared with the available drugs, initiating the cut down of several formulations already existing. It was also under concern that the increase in herbal demands would intentionally paves way for unethical practices of adulteration, substitution, deletion and incorporation of certain other drugs while formulating. To some extend this crisis will also affects the purification and incineration of various other drugs, obviously leading to an alleged pharmaceutical negligence liable to face the legal formalities causing abundant injury lawsuits. Another harmful challenge potential enough to cause health hazard would probably be the preservative overload, in order to sustain a longer shelf life thereby meeting consumer demands. Thus on considering this rapid loss of medicinal plants, it's the need of the hour for a swot analysis, so as to measure the needs to be taken under stringent basis, to tackle the crisis by incorporating government, various health sectors and stake holders to begin an initiation for

conserving and sustainably utilizing the medicinal plant genetic sources.

Āyurveda, the age old tradition with an excellent scientific and practical background, has been misinterpreted by various west-based custodians on their convenient basis, surrendering the identity and self respect that was won over millenniums, by labeling them in accordance to their national situations like CAM, herbal medicine, food supplement etc²⁰. Thus it's the need of the hour in propagating globally, the potentials of this system, keeping its identity as a mainstream medical system rather than paving ways to question its credibility and reputation, limiting its scopes beyond with far reaching repercussions. Considering the seriousness of this crisis, the government should also take cognizance of this issue by successfully coordinating between various sectors of relevant firms including National Medicinal Plant Board and Agricultural sectors wherein the main focus would be on to rescue and preserve the dying herb varieties and other medicinal plants popularly used in formulations. This conservation of medicinal plants along with its mass cultivation, processing and significant value addition with its marketing will also add on to its mutual benefits. In light of importance of these resources that provide the health care needs for the majority of humans and livestock population in our country, and also the fact that medicinal plants could be used as a sources of revenue for farmers, proper guidelines of training on conservation, utilization and development of medicinal plants, in support of achieving a wide network of farming and marketing with the farmers across the state through proper centers will have a positive impact over the crisis.

The center could also exponentially strike at the grass root level surveys for estimating the status threat and its management via, launching expanded bands of in-situ and ex-situ conservative measures. And this could fairly be brought about by encouraging establishments of natural

reserves or biosphere resources and also through setting up of medicinal plant gardens, artificial regeneration of botanical gardens and other arboreta. Successfully our government can also rely upon by initiating proper medicinal plant conservational programs in support of a field gene bank, an in-vitro gene bank including a seed bank, which are directly linked onto various medicinal projects at several institutes that could also popularize the potential avenue of medicinal plants among local farmers for their commercial cultivation. With the growing demand of herbal marketing sector worldwide due to chemo phobia, it was estimated that around 70-80% of the people rely chiefly on Āyurveda medicine to meet their primary health care needs. Thus the evolving commercial importance could only be met by adapting to advanced biotechnological tools like advanced breeding techniques. The biotechnological tools are also important to select, multiply, improve and analyze medicinal plants. Plant cell culture systems, in-vitro productions, genetic transformations, combinatorial biosynthesis etc could be adapted and this could be the powerful and key factor for enhancing the productivity of novel secondary metabolites. The detailed clues regarding their mechanisms for simultaneous analysis of multiple genes and gene expression could also be arrived at by using high throughput tools like DNA profiling techniques specifically DNA micro arrays. The center and the state should together cooperate for the coordination among various stake holders of related sectors like NMPB, State Industrial Development Corporation, Finance Corporation and other export promotion councils etc and also should precisely support research institutions, their program management, capacity buildings and surveys by declaring provisions for sufficient financial security to deal this out.

In the present scenario, when Āyurveda is totally gaining attention and importance worldwide, it has also led to the increasing concerns on their safety and thus

advanced and more active pharmacovigilance should be brought into mainstream for absolute monitoring of toxicological properties and proper documentations on the adverse drug reactions and other issues regarding drug safety should be monitored and to be updated by the active committee. In context of traditional medicine especially Ayurveda, Siddha, Unani (ASU), the number of adverse reactions to ASU drugs reported in the National Pharmacovigilance in India is negligible. The strong belief that ASU drugs are safe contributes to a large extent to this situation. Moreover, the lack of knowledge on the concept and importance of pharmacovigilance has added to this situation. Thus it is to be made mandatory, that all traditional medicines should be included in the pharmacovigilance system and should publish safety monitoring guidelines. Thus the data regarding the Adverse Drug Reactions with the administration of of herbal, mineral, metallic, animal and of other origin should be collected, collated, periodically monitored and analysed as per the scale evaluation. This would better establish the evidence clinical safety of these drugs in a scientific manner.

Thereafter Studies, Researches, structured documentations and system wise - Database Developments should also be carried out by the analysis core team members, to evaluate its potentiality and applicability. In addition the strategies that holds importance to factors like developmental methods to collect, analyze and interpret quantitative data on socio-economic benefits derived from medicinal plants, smooth conduction of ethno-medical survey to explore utilization of medicinal plants and other traditional health care practices, conducting researches on the propagation and cultivation of selected indigenous medicinal plants and finally advanced photochemical studies including extraction, standardization, safety and efficacy testing, dosage determination and formulation should be periodically conducted. The project monitoring and

evaluation will be regularly screened by the members of Project Coordinating and Monitoring Unit, Heads of Collaborating Departments/ Institutions will be monitoring it continuously, month wise or quarterly screening by the Project Implementation Committee so as to ensure its accuracy prior to any biased loopholes it could finally arrived at. Thus a longer implementation period is required for the conservation activities, due to time required to complete the biodiversity surveys, develop and implement medicinal plant management guidelines, and to determine and monitor sustainable harvesting levels for medicinal plant conservational activities is quite high. But with a better financial security and an active core committee capable enough to thrive through the challenges and loopholes, will be able to rule out every crisis in the herbal marketing scenario in the long run, and it isn't far to achieve this goal, towards globalization. Further unethical practices of herbal medicine, exposure to unreliable and misleading information through various personalized and commercial based advertisements, absence of focused marketing and branding, lack of qualified and skilled physicians and lack of knowledge sharing turns to be major challenges holding back the global promotion of Āyurveda. Advertising Standards Council of India (ASCI) has reported receiving numerous complaints regarding false and misleading advertisements of AYUSH Medicines including herbal medicines/products. Such complaints were also registered in the GAMA (Grievances Against Misleading Advertisements) portal maintained by the Department of Consumer Affairs (DoCA). Six States / Union Territories including Delhi, Maharashtra, Gujarath, Kerala, Karnataka and Chandigarh have reported 573 instances of such misleading advertisements during the last three years. Thus in order to control and regulate false and misleading advertisements regarding ASU drugs, strict implementation of Drugs and Cosmetics Act Rules 2018 in support of

state councils and licensing authorities should be ensured and periodically observed.

ĀYURVEDA RESEARCH AND DEVELOPMENT

With rapid changes of globalization, Āyurveda has failed to meet the current scientific trend with conceptually old scientific validations and due to this lack of scientific validations, in various concepts, this science is trailing behind. Hence evidence based-collaborative medical research²¹ is highly needed for global acceptance and recognition of Āyurveda. Thus this age old science of philosophical and experimental essence is a self healing science with a holistic approach to health and personalized medicine²². To test and validate upon its fundamental principles, to evaluate the mode of action of drugs, pharmacology, pharmacokinetics, pharmacovigilance, more advanced techniques and in depth screenings should be encompassed to Āyurveda research methodology, if this science is to be truly explored. Now considering Medical Research to be the prime need for contemporary Āyurveda, initiatives should be taken to bring more valuable scientific outcomes from the budding and skilled research scholars through startup conclaves and summits. In addition segregation of well established research infrastructure in support of experienced researchers if could conglomerate all these scientific process towards Artificial Intelligence, this will be an open gateway for a new phase of diagnosis and database documentation. Āyurveda with its outstanding significance in its fundamental theories will have a wider applicability if incorporated into IT and Artificial Intelligence invasively. Thus in this modern world of robotics and Artificial Intelligence²³, a computerized program well taught and trained can create wonders in the field of diagnosis and treatment compared to human counterpart. And also through well designed programming, it is even possible to create and store immense database in specific. Further such huge data's and

documentation history, it would further assist future research activities. It seems that the possibilities are limitless with further development of technology and if implemented this will make revolutionary changes in Āyurveda sector especially in areas like hospital related documentation, clinical analysis, preventive care, research and swasthya. This will only be an added advantage to the emerging researches in Āyurveda sector expanding to its global acceptance and profitability. The center should also ensure the cooperation and willingness of biomedical scientists together in parallel to Āyurveda research. Thus by empowering research through all these means, it will only add up to refresh and upgrade the solid knowledge that was diffused during colonial reigns. Further this age old science has even explained tools up on tools of examination millenniums back²⁴, and this could even be considered as the replica of modern research methodology if viewed from another angle, which has been augmented in support of scientific and various technological assistance. Thus the quality researches on fundamental principles of Āyurveda, in support of advanced scientific tools, can thus explore in detail all the medical researches and unsolved queries. Further for better advancement of research, the holistic as well as integrative approach should be taken into consideration by the research scholars. Thus Āyurveda, being a multipronged non-linear system of medical science²⁵, it could better arrive at conclusions of uncertainty behind unexplained effects.

Thus integration of Āyurveda with advanced technologies by standardized fundamental diagnostic principles will help solve most of the high magnitude challenges in areas of research and development. Also the integration of technologies like telemedicine, webinars, in the field of medicine has even come in the forefront and if to globally accept and make it to a mainstream life science, integration of Āyurveda research and modern technologies should be in the mainstay, time demanding.

In addition, research and development in focal areas of medical significance and emergency should be implemented in support of regional research institutes and all the research methodologies and fund managements should be made transparent to the center department via online portal. This clear cut evaluation and assessment of research methodologies along with transparent resource utilization by incorporating PFMS module centered activities will help progress the research activities within the mean time allotted.

DISCUSSION

With rapid increase of globalization, the industrial clusters have proved to have a key role in adding towards the global development of a country. Though the recent past was not found to be appreciable for Āyurveda, it has also witnessed a recent upsurge in terms of health, education, Industry and at service. The new era has witnessed modernization with globalization²⁶ and this was the most obvious and noticeable development in raising the marginal status of domestic & external marketing sources. Thus Āyurveda, the science of life with a holistic approach and renowned descent has already witnessed three millennia and has faced major transformation in the field of advancement in various sectors like information, Hospitality, R&D, medicinal plants, drug standards, resource developments, industrial sectors, international collaborations, education, policy and other services. Besides the healing aspect of Āyurveda the socio-economic progress are also working well in parallel with the medical tourism industry, since the demand for this age-old tradition was expected to cover the international claims of healing & mindfulness. Also according to the recent estimates, there is an increased demand for Āyurveda driving to its potential hold in global economic forefront and was expected to treble the global Āyurveda marketing estimates from \$ 3.4 billion in 2015 to \$9.7 billion in 2022²⁷. This report also calls for a

paradigm shift in core Āyurveda industries, using technology as an enabler to meet the increasing demand. According to the estimates of CII, Āyurveda sector in India will achieve a gross market size of \$4.4 billion by the end of 2018²⁸ and to this bullish outlook, Indian Āyurveda industry is projected to record a compounded annual growth rate of a robust 16% until 2025²⁹. Āyurveda sector is poised to grow at high double digit levels in the coming years in concern of highly conscious rise of young population apart from India's ageing population. Thus it is indeed required for Āyurveda to meet the global standards, in account of its growing demand on natural products, without compromising its quality in the international market. Āyurveda with its holistic approach encompassing various diet and lifestyle guidelines and comparatively reduced side effects has attracted a large population realizing its benefits, all over the world. This has even paved various platforms of international collaborations in fields of research, practice and even developing interests in areas of curriculum based teachings. Thus the growing interest and concerns in personalized health has finally contributed to the success of Āyurveda industry and there requires vibrant strategies and methodologies in adding to its globalization scale sector wise.

Thus Ayurveda with its ancient Indian structure full-fledged with philosophical abundance and holistic principles, if incorporating it into different cultures in order to meet the current global needs and acceptance in the process of globalization, it will certainly face certain degrees of challenges and drawbacks and this article through a meta-analytical study, has reviewed and discussed up on the scopes as well as solutions to most of the issues all throughout. As every science will progress and develop according to its credibility and Ayurveda is one such holistic science gaining acceptance and popularity. Irrespective of its credible nature, this article has detailed up on certain magnitudes

of prerequisites that requires transformation at paramount emergency and through this Ayurveda can also get established as one of the mainstream health care medicine with all its reputation and accepted globally, like Chinese and Greek medicine. Also since primary health care need is being one of the major debated topics across the nations and Health for all in the 21st century succeeding the health for all by 2000 all has revealed a unique opportunity for the organization to re-evaluate and rethink on the health care system to be adapted for the better implementation of this project. The reason for 'health for all by 2000' to get declined was the lack of incorporation between different areas of holistic and conventional biomedicine. And so this science with its full-fledged axials, and greater molding capacity if incorporated into different areas of primary health care with respect to globalization, there won't be any mirage in the proposed health care projects.

CONCLUSION

The indigenous system of medicine especially if Āyurveda with great concern in its growth and interest, if made available to a larger population, along with their advancements in holistic model and technological integration, it will add up to its mainstreaming and global acceptance. But this most probably the most challenged situation of an holistic health care system when social health is considered as the major component of health indicator and this has even aid to potential flaws in its health care practices nationally or worldwide. Crossing nations and historical dating, the concept of holism and related health practices flourished for centuries and has declined over the past few years, since because of reductionist theory. But in the current scenario there evokes a global re-emergence of holistic thinking and practices³⁰. Thus this article has analysed historical as well as the contemporary basis of holism, epistemology, Āyurveda herbal and product marketing scenario, R&D in Āyurveda sector, the challenges faced by

these sectors and probable solutions adding towards the global acceptance of this age old science. Although the holistic medicines are said to be evolved back carbon dating, they can better incorporate into modern parameters even pragmatically and one of the most important application are re-emerging holistic health care practices worldwide. Thus this article has explored the underlying context of the resurgence of Āyurveda, towards better globalization.

AUTHORS' CONTRIBUTIONS

Dr Santhi Krishna : Conceptualization and Design, Acquisition of Data, Analysis and Interpretation of Data, Drafting Manuscript

Dr Dinesh K.S : Conceptualization, Analysis and Interpretation of Data, Validation

Dr Nazeema P K : Analysis and Interpretation of Data, Validation

Source of Support: Nil

Conflicts of Interest: None Declared

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How to cite this article: Krishna S, Dinesh KS, Nazeema PK. Globalizing ayurveda - opportunities and challenges. *Int J Health Sci Res.* 2020; 10(3):55-68.
