

Ideal healthcare system for India

Definition of health has become more diversified than ever before by observations that it does not have much to do with the state of having a disease, or its absence, but to do with a person's integrated ability to perform and function efficiently with a productive value conducive to the well-being of his own, his family and society. This idea of integrating health to a duo of a disease-free state and a sound socio-psycho-spiritual combination was recognized as early as 2000 years ago, when Sushruta defined health as a physiological balance added with a psychosensual happiness¹. The other part of the aspect however remained neglected until recently and was recognized only after the observations that mere absence of a disease in a person does not essentially bring happiness.

In this view, health cannot be taken as an isolated subject of action unless the other issues affecting health, positively or negatively, are also being addressed simultaneously and effectively. An ideal healthcare system should be able to generate an integrated vision where people can be made aware of how they can become self-dependent and responsible about health and related issues not only with the view of keeping themselves free

of disease, but also to ensure that they can optimally utilize themselves in bringing about a feeling of well-being and happiness in themselves and among the people around them.

An ideal healthcare system as defined by Ayurveda is one which cures a disease without causing or precipitating other illness². Every healthcare system has its limitations and advantages. There are conditions where one system may work better than another, if tried early during the course of illness.

Considering the diversified needs of rural, urban and sub-urban populations, actual healthcare in India requires to be operated on a need-based strategy. This should critically evaluate the utility of modern advancements in healthcare and simultaneously take care not to devalue the essentials of traditional healthcare systems in operation in any existing situation.

Serious efforts should also be made to improve healthcare by due utilization of traditional skills added with the technological breakthroughs made in the modern science^{3,4}. This would possibly be the ideal healthcare system which may work most efficiently according to the diversified needs of healthcare in India with

regard to its economic, social and nutritional diversity.

A balanced approach without prejudices and favours and also without undue criticism is essential to reach the ultimate goal of health for all. What we need is to have an umbrella healthcare system with an open mind and open access to every aspect of healthcare. Those who wish to contribute to the integrity of this umbrella should be welcomed and promoted. Different medical systems may work as the spine and cloth of this umbrella, which ultimately aims at safeguarding patients from the shower of diseases.

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2. Tripathi, B. N. (ed.), *Charaka Samhita*, Nidana sthana 8/23 Chaukambha Surbharti Prakashana, Varanasi, 1983.
3. *The Indian Express*, 30 January 2006.
4. Alex, H., *J. Alternative Complement. Med.*, 2005, **11**, 221–225.

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Science is also an exercise in communication

Scientific training in our country should devote more attention in setting the goal of independence among Ph D students. At the end of their thesis all students must aim for becoming independent investigators as soon as possible and strive to do everything necessary in achieving this goal. Ph D students often suffer from the misconception that Ph D training is a process of learning of more and more techniques, especially those state-of-the-art ones with rather little realization of their applications. That is why any cursory inquiry about one's Ph D topic would often be responded by a list of techniques. Drawing similarity from the current day mantra of consumerist economy, wherein a customer is never at fault, I would, in this regard, be inclined to spare students and put all blame on the mentors for

such misconceived notion among the students.

From this premise of argument, it must be accepted at the outset that not all scientists/faculties have the required qualities for mentoring. A good publication record does not automatically qualify one to become a Ph D mentor. The point to consider in this case is whether the person was an independent investigator while making those publications, which is judged by the criteria such as senior authorship in the publication(s) and acknowledgement of grant(s), wherein s/he is PI. Also, the art of mentorship necessitates acquiring the skill of becoming a taskmaster/mistress without being a tormentor. The most successful mentor is someone who has successfully inculcated scientific independence among her/his students. Phe-

notypes of these students include, their abilities to design and perform experiments (even be it risky), writing papers and defending those till publication in standard journal and finally conceptualizing (be it rudimentary) plans for his/her independent research programme.

It is said that what succeeds in science is not the best idea, but the best defended idea. Unfortunately, teaching in this art of defence (i.e. the writing skill) happens to be the most neglected aspect of the Ph D training in our country. Mentors must devote enough time to teach their students the art of writing papers. I suggest that students carefully read only the result section including the figure legends of papers of the journals having an impact factor of 5.0 or more and write introduction and discussion sections at the rate of

once every month for six consecutive months. Such an exercise is guaranteed to yield favourable results for PhD students for the rest of their lives.

The next point to consider is the art of successful writing seeking grants, which is the ultimate measure of independence whereby the students could become their own teachers in learning the art of writing a successful grant proposals. I suggest that the students read the full paper except the result section and then make a tentative list of results to prove the given hypothesis (the so-called proof-of-

principal). Students should also make a habit of visiting the NIH web page, <http://crisp/cit/nih/gov>, in order to get a sense of the flavour of the state-of-the-art grants.

Finally, various national conferences should include in their programmes, events like a 2-day workshop on paper and grant writing (four lectures of 1 h each would suffice) for the students. Spreading the awareness on the need of effective scientific communication among budding scientists, i.e. the PhD students, is something, which will go a long way in

ensuring excellence in the exercise of communication among the PhD students. Scientific independence critically requires this attribute.

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Identification of gap areas for biological exploration

The three physical resources of the planet earth that include land, water and biological diversity are neglected, overlooked and taken for granted by humans. There is a need to study and document the immense biological wealth, before it is destroyed. India was botanically one of the best known tropical countries by late 19th century, by which time the country had one of the best national flora in the world¹. The funding for biodiversity inventory research is meagre in contrast to that provided for biotechnology and other applied sciences. We have not yet completed the basic survey of our biota. And are yet to have an updated and modern *Flora of India*. We need extensive infrastructure and talented taxonomic personnel in abundance.

Studies carried out in India so far have resulted in the identification of about 47,000 species of plants and 81,000 species of animals. More than 15 lakh plant specimens housed in the herbaria of BSI are from 1800 onwards. Dense forest with impenetrable ground cover, inhospitable conditions and danger of wildlife prevents remote-area inventorization and restricts researchers to do inventorization only along the accessible areas/routes. Most of the systematic studies carried

out in India are partially systematic. In several districts of Andhra Pradesh, the number of flowering plant taxa reported was in the range 700–800, which provides evidence for under exploration². Many islands of the Andaman & Nicobar are under the category of unexplored or under explored³. This points out the status of botanical exploration of our country.

It is imperative for the country to have information on bioresources in as much detail as possible; however, the conventional method of inventorization would not optimize this effort. Therefore, there is a need to prioritize areas for inventorization. In order to achieve success, we have to find out the 'gaps' in the approach of inventorization and biodiversity assessment.

There is a need to digitize the location/area/surroundings of herbarium accessions in GIS domain. These can be then overlaid on satellite data-driven maps like vegetation type, fragmentation, disturbance regimes, biological richness and forest cover change. This would help in visualizing the 'gap' areas, and characterize areas into unexplored to well-explored zones and also provide inputs for further inventorization. Incorporation

of geo-referenced herbarium data will allow assessing the habitat loss and change in landscape in conjunction with temporal satellite data. It will also help in understanding the past and present distribution ranges of species.

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