

RESEARCH ARTICLE

Myth and reality of "theory-driven individualised practice" in Ayurveda: Mapping physicians' approaches using case-based scenarios

MAYANK CHAUHAN, VIJAY KUMAR SRIVASTAVA, KISHOR PATWARDHAN

Abstract

Background: The curricula of Ayurveda programmes emphasise various theoretical constructs such as Tridoaha (three factors determining the state of health), Agnibala (digestive strength), Samprapti (patho-physiology), among others. It is often argued that practitioners follow an individualised approach based on these principles while treating patients. Yet, dependable data on their real-world influence is lacking. The aim of this study was to record the extent to which these constructs drive decision-making among Ayurveda practitioners and to examine whether these constructs determine individualisation of the interventions.

Methods: We employed an emailed survey to record physicians' perceptions. Convenience sampling was chosen as the sampling method. Registered Ayurveda practitioners located across India with a minimum of five years of clinical experience were invited to participate. Five case-based scenarios depicting different clinical conditions were presented to the physicians. Questions that accompanied each case scenario asked the physicians to record clinical diagnoses, treatment plans, and the Ayurveda principles that determined their treatment.

Results: A total of 141 physicians responded, from whom we received 152 responses as seven physicians responded to more than one scenario. The results suggest a significant lack of consensus among physicians regarding clinical diagnoses,

interventions, and their understanding of pathophysiology in the given clinical scenarios. Many conflicting opinions were also noted.

Conclusion: Theoretical constructs do not appear to determine either prescriptions or individualisation uniformly. Two ethical questions arise: "Is this situation due to an inherently weak theoretical framework of Ayurveda?" and "How can one justify spending hundreds of hours teaching these theories?"

Keywords: Ayurveda practice; individualisation; theoretical constructs; real world scenario.

Introduction

India officially recognises Ayurveda and other traditional systems of healthcare such as Yoga, Unani, Siddha and Sowa Rigpa along with biomedicine. (In this paper, we employ the term "biomedicine" to represent the conventional practice of what is often referred to as modern medicine, Western medicine, or evidence-based medicine.) The country follows a parallel policy model where each of these traditional systems has its own dedicated infrastructure such as colleges and hospitals, along with different boards for regulation of education and practice under the National Commission for Indian Systems of Medicine (NCISM). This model, for obvious reasons, offers limited scope for formal interaction among the experts of different streams [1, 2].

Ayurveda being the most prominent among the traditional healthcare systems, is taught in nearly 500 colleges in the country. These colleges run graduate and postgraduate programmes and produce thousands of graduates every year. There are studies suggesting that the quality of education imparted in these colleges is not uniform and is often suboptimal [3]. Over the past few decades, the Government of India has been trying to streamline the educational sector by revising these curricula and by structural reforms in governance [4]. In 2020, the Central Council of Indian Medicine (CCIM) was dissolved and a new regulatory body, NCISM was established. The NCISM has introduced a new curriculum for a graduate programme in the year 2022. However, it has been argued that though newer pedagogical approaches have been introduced in the new curriculum, most of the content has essentially remained unchanged [5,6].

It must be noted that the theoretical constructs of Ayurveda constitute a significant part of the curricula of Ayurveda

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graduate and postgraduate programmes in India. These theories are considered foundational in the understanding of physiology, pathology, diagnostics and therapeutics. The syllabi of two specific subjects, viz, *Kriya Sharir* (Ayurveda Physiology) and *Roga Nidan evam Vikriti Vijnana* (Ayurveda diagnosis and pathology) deal with theories like *Tridosha* (*Vata, Pitta and Kapha*), *Dhatu Parinama* (process of tissue transformation), *Kriya Kala* (stages of disease evolution), *Oja* (essence of all *Dhatus*), *Aharapaka* (process of digestion), *Mutrotpatti* (process of formation of urine) etc [7]. These theories are believed to form the basis of certain observable manifestations such as *Prakriti* (personality), *Agnibala* (digestive strength), *Kostha* (nature of bowel movements), *Dhatu Sarata* (health status of a tissue) etc. In view of these theoretical constructs, it is commonly argued that an individualised approach is incorporated into the practice of Ayurveda. This "person centric approach" is said to lay emphasis on the state of an individual that makes him/her susceptible to a disease as being more important than the disease itself [8]. This is the reason why this approach of Ayurveda is sometimes called a "holistic" approach.

While evaluating a disease, Ayurveda physicians are expected to take into consideration many factors such as *Dosha* (the regulating mechanisms), *Dushya* (the tissues that get deranged), *Bala* (strength of the patient), *Kala* (time factor), *Agni* (digestive factor), *Prakriti* (personality), *Vaya* (age of the patient), *Sattva* (mental strength of the patient), *Satmya* (factors one is habituated to), *Ahara* (diet), *Avastha* (stage/phase) etc [9]. A physician ideally plans interventions based on these factors with an aim of reversing the *Samprapti* (pathogenesis) by achieving *Samprapti Vighatana* (disruption of the disease process and restoration of normalcy) [10].

In real-world situations, gauging the extent to which these theories drive decision-making by Ayurveda physicians has been a contentious issue. Most of the published clinical trials exploring the effectiveness of Ayurveda interventions do not incorporate individualisation. Even in those clinical trials where "individualisation" was claimed to be considered, the algorithms that determined decision making by the concerned physicians have not been described [11]. This deficiency renders the results of such studies non-reproducible. Furthermore, a few studies suggest that the precise diagnosis and identification of some of these variables such as *Prakriti*, *Nadi* (pulse), *Jihva* (tongue), *Agni*, etc, are often subjective and vary from physician to physician, giving rise to a considerable level of inter-rater variability [12,13,14,15]. A few studies have also revealed how prescription practices among Ayurveda physicians are inconsistent and arbitrary [16, 17]. A study carried out in 2019 demonstrated a significant extent of variability among Ayurveda physicians in diagnosis and treatment of hypertension patients [17]. It may be noted that studies evaluating the extent to which Ayurveda theories influence clinical decision making among Ayurveda physicians are not available.

It has also been argued that Ayurveda classical textbooks

contain many observations (such as clinical signs and symptoms), theories (such as those of *Tridosha and Panchamahabhuta*), and speculative descriptions (such as the process of urine formation), which need careful reassessment so that only verifiable descriptions are retained, and the rest discarded. It is argued that physiology and pathology recorded in the Ayurveda classics is based on the then available limited understanding of the human body [5, 18, 19, 20, 21]. The present study was, therefore, carried out to ascertain perceptions of Ayurveda physicians and their use of Ayurveda patho-physiology theories by analysing their responses to certain case-based scenarios.

The study was aimed primarily at recording the extent to which the principles of Ayurveda physiology and pathology described in classical texts, and taught in different curricula, drive the process of diagnosis and treatment modalities by Ayurveda physicians. An additional objective was to examine whether these concepts are applied by practitioners for the purpose of individualising interventions.

Methods

We conducted a cross-sectional study using an emailed survey to record physicians' perceptions. Registered Ayurveda practitioners located across India with a minimum of five years of clinical experience were included in the study. Convenience sampling was chosen as the sampling method. An online form was developed that consisted of five case-based scenarios depicting distinct clinical presentations. Each detailed case scenario was appended with open-ended questions related to clinical diagnosis, proposed treatment plan, Ayurveda physiology that determined the treatment plan, etc. This questionnaire was distributed via email to the deans, principals, and directors of 495 Ayurveda colleges, requesting them to share it with the eligible Ayurveda physicians in their institutions. Additionally, it was shared with various professional groups of Ayurveda physicians on different social media platforms. Physicians were asked to select one or more cases from the five scenarios based on their specialisation or area of interest. We received a total of 152 responses from 141 physicians. The participants were from different regions of India and represented different geographical zones. The online form stated that by filling out the form, respondents give consent to use the gathered data in our thesis or publications, while ensuring strict confidentiality.

Ethics clearance

The study received approval from the Ethics Committee and PG Medical board of Institute of Medical Sciences, Banaras Hindu University, Varanasi, on October 29, 2021 (Reference: Dean/ 2021/EC/2985).

Questionnaire designing

A validated questionnaire was prepared with five case-

based scenarios adapted from recently published case reports in different academic journals. We introduced certain modifications to these reports to avoid their easy identifiability. Details of the therapeutic interventions used in the published papers were removed to present these as fresh “cases” for physicians to diagnose and suggest treatment modalities.

Validation process

Since the case scenarios were adapted from published case reports, a rigorous validation process was not necessary for content accuracy. However, the framed questions were validated by mailing the questionnaire and scenarios to five experts with over 15 years of clinical experience in the speciality, seeking their feedback. Following the feedback from the experts, we made necessary modifications to the questions and case information. The final questionnaire was created using Google Forms. [Supplementary file 1](#) depicts the skeletal framework of the questionnaire that was designed. The cases given in the questionnaire were those of dimorphic anaemia, intervertebral disc prolapse (IVDP), Covid-19, pompholyx, and male secondary infertility. The details of the case scenarios and corresponding questionnaires are available in [Supplementary file 2](#).

Results

Responses received

The responses were collected between June 2022 and January 2023. A total of 152 responses were received against the five case scenarios from practitioners spread across the nation. Out of these, 141 responses were to single cases, while seven physicians recorded their responses to more than one case scenario. [Supplementary file 3](#) depicts the number of responses received for different case scenarios.

Demographic details

[Supplementary file 4](#) shows the demographic details of the participants.

Ayurveda diagnosis

Table 1 shows the different clinical diagnoses made by Ayurveda physicians for each case scenario in our sample. It is clear that there is a lack of consensus among Ayurveda physicians when it comes to Ayurveda diagnosis. Further, a significant level of mutual incongruence in the diagnostic entities suggested is observed in each of the five cases. The variation was minimal in the case of anaemia which may be because the smallest number of physicians responded to this case. A maximal variation in terms of number of diagnostic entities proposed was for IVDP. However, a wide range of terms indicating unrelated and distinct entities was used for diagnosing pompholyx. Physicians were found to be using terms such as *Katishula*, *Prishthashula*, *Pranijanya Roga*, *Sroto Avarodha*, obstruction of *Apana Vata*, *Tvagashrita Pitta Dushti*, *Tvak-Roga* etc, which are coined terms and are not found

directly in the classical textbooks to indicate these clinical conditions.

Biomedical diagnosis

It was optional for Ayurveda physicians in our study to provide a biomedical diagnosis. We asked this question because the curricula contain the basics of modern medical diagnostics.

In the case of anaemia, all eight respondents gave their biomedical diagnoses except one who said such a diagnosis was not required. However, the diagnosis varied from dimorphic anaemia to anaemia of gut origin. Only three physicians gave a precise diagnosis.

In the case of IVDP, out of 67 respondents, 48 physicians gave their biomedical diagnoses whereas 19 declared that they did not need the diagnosis in biomedical terms. The diagnoses varied from Sciatica to Ankylosing spondylosis. Forty physicians diagnosed the condition more or less precisely.

In the case of Covid-19, out of 20 responses, we received biomedical diagnoses from 12 physicians, whereas eight felt that they did not require a biomedical diagnosis. The diagnostic terms they used varied from Covid-19 to “Zoonotic disease”. Most physicians diagnosed this condition accurately.

In the case of pompholyx, out of 40 respondents, 19 physicians provided their clinical diagnoses based on biomedical understanding, whereas 21 did not provide such a diagnosis. The diagnoses provided by 19 varied from pompholyx to urticaria. Of the 40, only 10 physicians could diagnose this condition correctly.

In the case of male secondary infertility, out of 17 physicians, eight provided a biomedical diagnosis, whereas nine did not. It may be noted that the information provided in this case scenario was insufficient to come to a conclusive diagnosis in terms of biomedical sciences.

Interventions suggested

Dimorphic anaemia

The suggested interventions varied from *Shamana Chikitsa* (symptom-specific/disease-specific treatment usually in the form of formulations) (4), *Deepana–Pachana* (stimulating and promoting digestion) (1), *Dhatu vardhana Chikitsa* (intervention to promote tissue building) (3), *Yoga/pranayama* (1), and *Pathya–Apathya* (wholesome and unwholesome diet) (1).

Covid-19

Sixteen physicians prescribed *Shamana Chikitsa*, out of which, 11 mentioned classical/proprietary formulations whereas five physicians did not mention any formulations. Along with *Shamana chikitsa*, physicians also included other

Table 1. Different clinical diagnoses made by respondents for each case scenario.

Clinical case	Number of responses	Diagnosis	N (%)
Dimorphic anaemia	8	<i>Pandu</i>	5 (62.5)
		<i>Pandu progressing to Kamala</i>	1 (12.5)
		<i>Pandu as a consequence of Grhani</i>	1 (12.5)
		<i>Pandu as a consequence of Rasa Kshaya</i>	1 (12.5)
IVDP	67	<i>Gridhrasi</i>	26 (38.8)
		<i>Vataja Gridhrasi</i>	3 (4.5)
		<i>Kaphaja Gridhrasi</i>	1 (1.5)
		<i>Vata-Kaphaja Gridhrasi</i>	15 (22.4)
		<i>Kati/Prishtha Shula</i>	3 (4.5)
		<i>Katigata Vata</i>	4 (6.0)
		<i>Katigraha</i>	3 (4.5)
		<i>Asthigata Vata</i>	1 (1.5)
		<i>Asthimajagata Vata</i>	3 (4.5)
		<i>Sandhivata</i>	2 (2.9)
		<i>Asthi-sandhigata Vata</i>	2 (2.9)
		<i>Vatavyadhi</i>	3 (4.5)
		<i>Vyana-Apana Dushti</i>	1 (1.5)
Covid-19	20	<i>Kapha-Vataja Jvara</i>	3 (15)
		<i>Sannipataja Jvara</i>	3 (15)
		<i>Jvara</i>	2 (10)
		<i>Vataja Jvara</i>	1 (5)
		<i>Sama Taruna Jvara</i>	1 (5)
		<i>Rasa dhatu-gata Jvara</i>	1 (5)
		<i>Dhatu-lina (saama) Jvara</i>	1 (5)
		<i>Sama-Abhishangaja Jvarra</i>	1 (5)
		<i>Pranijanya Roga</i>	1 (5)
		<i>Jvara with Grahani</i>	1 (5)
		No Ayurveda diagnosis given	5 (25)
Pompholyx	40	<i>Visphota</i>	10 (25)
		<i>Vicharchika</i>	5 (12.5)
		<i>Pidika</i>	1 (2.5)
		<i>Kushtha</i>	3 (7.5)
		<i>Pitta-KaphajaKushtha</i>	3 (7.5)
		<i>Pittaja Kushtha</i>	2 (5)
		<i>Pundarika Kushtha</i>	1 (2.5)
		<i>Pama Kushtha</i>	6 (15)
		<i>Shita-pitta/Udarda/Kotha</i>	3 (7.5)
		<i>Vipadika</i>	2 (5)
		<i>Visarpa</i>	3 (7.5)
		<i>Tvak-Roga-Seasonal/Allergic Condition</i>	1 (2.5)

Continued in the right column

Male infertility	17	<i>Shukra Kshaya</i>	4 (23.4)
		<i>Klaibyata</i>	2 (11.8)
		<i>Vrishana Shopha</i>	2 (11.8)
		<i>Shukra Dushti</i>	2 (11.8)
		<i>Vataja Shukra Dushti</i>	1 (5.9)
		<i>Vata-Kaphaja Shukra Dushti</i>	1 (5.9)
		<i>Shukravaha Srotas Dushti/Granthi</i>	3 (17.6)
		<i>Apana Vata obstruction</i>	1 (5.9)
		<i>Shukravrita Vata</i>	1 (5.9)

treatment plans such as *Laghana* (fasting therapy) (6), *Deepana-Pachana* (3), *Kavala/gandoosha* (moving/holding mouthful of medicated liquid) (2), *Pratimarsha nasya* (a type of nasal instillation) (1), and *Dhumapana* (inhaling herbal smoke) (1). While three advised *Shodhana Chikitsa* (cleansing therapy), with one of them advising *Vamana* (therapeutic emesis) and another *Basti* (therapeutic enema), the third Ayurveda physician did not specify any. Three physicians advised *Rasayana Chikitsa* (rejuvenation therapy). Three physicians advised *pathya ahara* (wholesome diet) and one added *Yoga* to the prescription.

Pompholyx

Seven physicians advised *Deepana-Pachana* medicines at the initial stage following which, different physicians prescribed the following varied interventions: *Snehapana* (internal oleation) (4), *Shodhana* (7), *Shamana* (7), *Rasayana* (2), *Pathya-Apathya* (3) and *Nidana parivarjana* (avoidance of causative factors) (1). Nine other physicians did not specify the type of *Shodhana* therapy that they advised. Different types of *Virechana* (therapeutic purgation) prescribed by the physicians included *Nitya Virechana* (daily purgation) (3), *Sadyo Virechana* (swift purgation) (1), *Ruksha Virechana* (purgation using dry measures) (1), and *Mridu Virechana* (mild purgation) (1). Thirty-three physicians prescribed *Shamana Chikitsa*. Along with *Shodhana* and *Shamana Chikitsa*, the other therapies prescribed by physicians were *Rasayana* formulations (7), *Raktamokshana* (blood-letting) (2), *Nidana-parivarjana* (2), *Langhana* (1) and *Pathya-Apathya* (1). Eleven physicians advised local application and three physicians advised external *Rukshana karma* (drying measures) using *Kashaya dhara* (controlled pouring of a stream of warm decoctions).

Male secondary infertility

Four physicians advised initial *Deepana-Pachana* medicines followed by *Snehapana* (3), and *Shodhana* (4). *Shodhana* measures prescribed included *Yapana Basti* (a kind of therapeutic enema) (1), *Virechana* along with *Madhutailika Basti* (rectal enema containing honey and oil primarily) and *Uttara Basti* (introducing medicated liquids through urethra) (1), *Virechana* (1), *Ruksha Virechana* along with *Uttara Basti* (1).

Table 2. Interventions suggested by the physicians in case of IVDP (n=67).

S. No.	Treatment Plan	N (%)
1.	<i>Nidana Parivarjana</i> (avoidance / stopping indulgence in causative factors)	5 (7.5)
2.	<i>Deepana-Pachana</i> (stimulating & promoting digestion)	11 (16.4)
3.	<i>Langhana</i> (Lightness promoting / famishing therapy)	3 (4.5)
4.	<i>Shamana Chikitsa</i> (palliative treatment) a) <i>Shamana Chikitsa</i> without mentioning specific formulations a) <i>Shamana Chikitsa</i> with a mentioning formulations	4 (6.0) 46 (68.6)
5.	Internal Snehana (Oleation)	11(16.4)
6.	a) <i>Svedana</i> (not specified) (Fomentation) b) <i>Svedana</i> (specified as follows:) i) <i>Patra Pottali/ Patra Pinda Svedana</i> (sweating induced by applying heated fresh green leaves) ii) <i>Nadi Svedana</i> (Sweating induced by steam directed through a hose) iii) <i>Local Valuka Svedana</i> (sweating induced by a cloth pouch containing heated sand) iv) <i>Sarvanga Svedana</i> (full body fomentation) v) <i>Ruksha Svedana</i> (dry fomentation) vi) <i>Parisheka Svedana</i> (Sweating induced by streaming a pre-warmed medicated liquid)	12 (17.9) 11 (16.4) 6 (9.0) 3 (4.5) 2 (3.0) 1 (1.5) 1 (1.5)
7.	<i>Shodhana Chikitsa</i> (Cleansing therapy) a) Not specified b) <i>Virechana</i> (Therapeutic purgation) i) <i>Virechana</i> (not specified) ii) <i>Sadyo Virechana</i> (swiftly induced purgation) iii) <i>Snigdha Virechana</i> (Therapeutic purgation using purgative oils/medicated ghee) iv) <i>Mridu Virechana</i> (therapeutic laxatives) v) <i>Tivra / Tikshna Virechana</i> (drastic therapeutic purgation) c) <i>Basti</i> (Therapeutic enema) i) <i>Basti</i> (not specified) ii) <i>Matra Basti</i> (Low-dose enema with medicated ghee or oil) iii) <i>Vaitarna Basti</i> (a variety of therapeutic enema) iv) <i>Yapana Basti</i> (a variety of therapeutic enema) v) <i>Niruha- Anuvasana</i> both (therapeutic decoction enema & oily enema both) vi) <i>Yoga Basti</i> (Course of eight combined therapeutic enemas) vii) <i>Kala Basti</i> (Course of sixteen therapeutic enemas) viii) <i>Karma Basti</i> (Course of thirty combined therapeutic enemas)	2 (3.0) 6 (9.0) 4 (6.0) 4 (6.0) 3 (4.5) 1 (1.5) 16 (23.9) 12 (17.9) 5 (7.5) 3 (4.5) 6 (9.0) 5 (7.5) 4 (6.0) 1 (1.5)
8.	Local application a) <i>Kati Basti</i> (Therapeutic retention of oil over lumbosacral region) b) <i>Griva Basti</i> (Therapeutic retention of oil over cervical region) c) <i>Lepa</i> (application of poultice) d) External oleation	29 (43.3) 2 (3.0) 2 (3.0) 6 (9.0)
9.	a) <i>Abhyanga</i> (Application of oil followed by massage on the afflicted region) b) <i>Sarvanga Abhyanga</i> (application of oil followed by massage all over the body)	11 (16.4) 4 (6.0)

10.	<i>Agni karma</i> (Thermal cauterization)	10 (15.0)
11.	<i>Raktamokshana</i> (Bloodletting) a) <i>Sira-vyadha</i> (Bloodletting by means of venesection) b) <i>Jalouka-avcharanam</i> (Bloodletting by means of leeches)	3 (4.5) 1 (1.5)
12.	Other therapeutic methods a) <i>Taila Pichu</i> (Therapeutic oil-soaked tampon) b) <i>Dashamula kshira dhara/ Kanji dhara seka</i> (Controlled pouring of medicated milk/ buttermilk/ fermentative product over specific region) c) <i>Pizhichil/khazmbu</i> (a type of massage followed in Kerala) d) <i>Shirodhara</i> (Controlled pouring of medicated oil or other liquids on the forehead) e) <i>Nasya</i> (Intranasal administration of medicines)	1 (1.5) 2 (3.0) 3 (4.5) 1 (1.5) 1 (1.5)
13.	<i>Rasayana Chikitsa</i> (Rejuvenation and revitalization therapy)	10 (14.9)
14.	<i>Pathya-Apathya Ahara/Vihara</i> (favourable — unfavourable diet & lifestyle)	11 (16.4)
15.	Yoga Practices	7 (10.4)

Two physicians did not mention the specific type of *Shodhana* therapy that was advised. Thirteen physicians prescribed *Shamana Chikitsa*. Four physicians added *Rasayana* (rejuvenating therapy) formulations and three added *Vajikarana* (correcting sexual dysfunction) formulations along with *Shodhana* and *Shamana Chikitsa*. Two physicians also advised local applications, *Parisheka* and *Avagaha* (streaming warm liquids or immersion of the affected body part in liquids).

IVDP

A detailed mapping of the large number of different interventions prescribed by the physicians in the case of IVDP is provided in Table 2.

Ayurveda patho-physiology

Dimorphic anaemia

Four physicians considered *avara bala* (inadequate strength of the patient) and did not prescribe *Shodhana Chikitsa*, though two of them prescribed *Mridu Virechana* (mild purgation). One physician considered *Saama Pitta-Kapha* condition and hence prescribed *Sadyo Virechana* (immediate and swift purgation). One physician considered the *Grahani dusti* (vitiation of a portion of digestive tract) in the given case and hence prescribed *Virechana* and *Basti*. Five physicians suggested diminished *Agni* of the given subject. Six physicians considered vitiated *Pitta* in their explanation as a basis of intervention. Two physicians mentioned Ayurveda medicine for *Shotha* (inflammation / swelling) without explanation. Five physicians prescribed iron-containing formulations and out of these five, three physicians considered them to be working as a *Rasa/Rakta-dhatu-vardhana* (Ayurveda formulations as substitute for iron).

Covid-19

Fifteen physicians considered *Aama* formation, five considered *Nidana sevana* (exposure to causative factors) leading to *Rasa vaha srotas dushti* (disturbance of the channels carrying *Rasa*), two considered *nidana sevana* to be producing *mandagni* (diminished digestive fire) and vitiation of *dosha* leading to *kha-vaigunya in gala-talu, Pranavaha srotas* (channels carrying *Prana*; vital breath) and *Rasavaha srotas*. Three physicians considered a weak state of *vyadhi kshamatva* (immunity). Two physicians did not explain why they prescribed *Shodhana Chikitsa*. One physician explained the condition due to a disturbance in *Grahani* (a portion of the gut) along with *agantuja jvara* (fever due to external causes) involving *Pittadhara Kala* (a portion of the gut), *Pranavaha srotas* and *Rasavaha srotas*. One physician clearly stated that clinical manifestations are used for diagnosis, and not pathological processes.

Male secondary infertility

Five physicians considered *Shukra Vaha Srotodushti* (disturbance of the channels carrying semen) as the main cause, which occurs due to *avarodha* (obstruction), leading to *Vata vriddhi* (increase in *Vata*) and resulting in *Shukra dhatu kshaya* (decrease in Semen). One physician considered *Shopha* (swelling) as the basis of his/her intervention while another one considered *Shopha* as well as *Vata dosha*. Three physicians considered vitiation of *Vata* and *Kapha dosha* to be responsible. Two physicians considered a disturbance in *Agni* to be responsible for the condition. Four physicians considered the medicines they prescribed simply to be the drugs of choice for this condition. Five physicians who mentioned *Rasayana* and *Vajikarana* formulations in their treatment cited age and stress as the main reasons for doing

Table 3. The patho-physiology based on Ayurveda provided by different physicians in the case of IVDP to justify their interventions (n=67).

S. No.	Explanation	Number
1.	Consider Nidan parivarjna (avoidance of causative factors) & introduced Pathya-Apathya (diet & lifestyle prescriptions) as a preventive measure	23 (34.3%)
2.	Consider the <i>Aama-avastha</i> (a state of incomplete digestion, transformation or metabolism), and to address this, suggest different ways to eliminate <i>Aama</i> , which are as follows: <ul style="list-style-type: none"> a) <i>Aama-hara</i> (treatment of <i>Aama</i>) treatment without providing detailed information b) <i>Deepana-Pachana</i> (stimulating and promoting digestion) c) Local <i>Ruksha svedana</i> (local dry fomentation) and internal <i>Aama Pachana</i> medicines (to promote the digestion of <i>Aama</i>) will help to overcome <i>Aama</i> d) <i>Aama Pachaka Snehana</i> (oleation for digesting <i>Aama</i>) for local application as a choice of treatment e) <i>Sneha Virechana</i> (therapeutic unctuous purgation) to eliminate <i>Aama</i> without creating <i>Vata prakopa</i> f) <i>Vaitarana Basti</i> (a type of therapeutic enema) helps to relieve <i>Aama</i> g) <i>Shamana</i> (palliative) formulations work as <i>Aama-Pachana</i> 	Total = 27 (40.3%) 2 11 1 1 2 2 8
3.	<i>Vata-Anulomana</i> (expulsion of obstructed <i>Vata</i> by ensuring its normal course of movement) as both <i>Shodhana</i> and <i>Shamana Chikitsa</i> for different reasons, which are as follows: <ul style="list-style-type: none"> a) After <i>Aama Pachana</i>, <i>anulomana</i> medicines will help to overcome <i>Aama</i>. b) <i>Vata Anulomana, Sroto Shodhana</i> (Clearing the channels), <i>Basti & patra-potali svedana</i> and <i>samyak mala visarjana</i> for <i>Kapha Avrita Vata</i> (occlusion of normal functioning of <i>Vata</i> due to <i>Kapha</i>) condition (to remove the <i>Kapha avarana</i> at <i>Kati</i> and to relieve pain and stiffness) c) <i>Vata prakopa</i> is due to obstruction for which <i>Vata Kapha</i> suppressing treatment is prescribed targeting the low back region d) <i>Virechana</i> helps in cleansing the bowel (<i>Annavaaha</i> and <i>purishavaha Srotas</i> related complaints and corrects the distorted <i>Apana Vata</i>) and promotes the <i>anulomana</i> of <i>Apana</i> which helps in further reducing the pain. e) Prescribe <i>Shamana</i> formulations which work as a <i>Vata-anulomana</i> which helps in proper functioning of <i>Apana Vata</i> or act on the main seat of <i>Vata</i> i.e., <i>Pakvashaya</i> (large intestine/rectum). Once <i>anulomana</i> starts it will diminish the pain and also constipation, unsatisfactory bowel evacuation will improve. 	Total = 34 (50.7%) 3 11 9 6 5
4.	<i>Vata</i> is aggravated and hence to pacify <i>prakupita</i> (vitiated) <i>Vata</i> following management along with <i>Ama-Pachana</i> & <i>Vata-Anulomana</i> is prescribed, the details of which are as follows: <ul style="list-style-type: none"> a) <i>Snehana, Svedana</i> and <i>Basti</i> are treatments of choice. (<i>Snehana</i> and <i>Svedana</i> are to correct vitiated <i>Vata</i> & the choice of <i>Basti</i> is focused on the site (i.e. <i>Vata kopa</i> in the <i>Kapha sthana</i> of joints). b) <i>Snehana</i> and <i>Svedana</i> are to correct vitiated <i>Vata</i> & the choice of <i>Basti</i> is focused on the site (<i>Vata Kopa</i> in <i>Pakvashaya</i>). c) It is a case of <i>Vata vyadhi</i>, affecting the lower portion of the body, which is <i>Vata Stana</i> (site) and moreover it is the case of <i>Asthi-Majjagata Vata</i>. Hence for <i>Asthi gata vikaras</i>, <i>Basti</i> with <i>tiktaka ghrta</i> is planned. d) <i>Basti</i> for vitiated <i>Vata dosha/Yoga Basti</i> as a mode of direct action on <i>Vata sthana</i>. e) <i>Snigdha virechana</i> and <i>Sneha Basti</i> for <i>Vata Shamana</i> f) <i>Kosta shodhana</i> for <i>Koshta-gata Samsrishta dosha nirharana, Sramsana</i> (mild laxatives) is <i>chikitsa</i> for <i>Vata vyadhi</i>. g) Local application of <i>snehana</i> and <i>svedana</i> is for <i>Katigata Vata shamana</i> and <i>vedana shamana</i>. h) <i>Erandamooladi Niruha Basti</i> for <i>Vatavyadhi / Gridrasi Chikitsa</i> 	Total = 19 (28.4%) 5 3 2 2 1 1 2 3
5.	<i>Anubandha</i> (association) of <i>Saama Pitta dosha/ Vata-Pitta dosha</i> for which <i>Virechana</i> followed by <i>Basti karma</i> & <i>Shamana Chikitsa</i> are prescribed	5 (7.5%)
6.	<i>Vata-vruddhi</i> (aggravation of <i>Vata</i>) and <i>sthana samshraya</i> (state of a <i>dosha</i> localising outside its actual location) at the <i>Kati pradesha</i> (hip region) due to <i>kha vaigunya</i> (derangement in <i>Srotas</i>), leading to the symptoms. The treatment is focused on rebalancing <i>Vata</i> using <i>Snehana, Svedana</i> (<i>Patra pinda Svedana, Nadi Svedana</i>), <i>Matra Basti/Kati Basti</i> .	7 (10.4%)

7.	Considered <i>Asthi dhatu kshaya</i> (diminution of bone) due to <i>Vata prakopa</i> (provocative stage of <i>Vata</i>) for which they prescribed the following: a) <i>Balya</i> and <i>Poshaka Chikitsa</i> (strength promoting and nourishment) b) Calcium & Vit. D3 c) <i>Pravala</i> and <i>Shankha</i> (Coral & Conch shell powder) for Calcium supplement d) <i>Guggulu tiktaka ghrita anuvasana Basti</i> e) <i>Kshirabala taila Kati Basti</i> (<i>Bruhaniya</i> & <i>Asthi Majja Gamitva</i>) f) <i>Panchatikta Kshirbala Yapana Basti</i>	Total = 28 (41.8%) 14 4 5 2 2 1
8.	Prescribe treatment for <i>Vatahara / Shamana Chikitsa</i>	27 (40.3%)
9.	<i>Shamana formulations as Shoolahara / vedana- sthapaka</i> (to control pain)	19 (28.4%)
10.	<i>Guggulu</i> /other formulations to help in minimizing the <i>Vata</i> /Pain because of the anti-inflammatory and NSAID effect.	6 (9.0%)
11.	<i>Shothahara Chikitsa</i> (Substance alleviating inflammation)	9 (13.4%)
12.	<i>Shamana</i> formulation for abdomen related problems.	13 (19.4%)
13.	Deranged <i>Agni</i>	15 (22.4%)
14.	Classical/proprietary formulation work as a nerve tonic (work on nervous system)	4 (6.0%)
15.	Local application	
	1. <i>Kati Basti</i> (therapeutic retention of oil over lumbosacral region)	29 (43.3%)
	(a) Avoid <i>Kati Basti</i> in <i>Ama-avastha /avarana avastha</i> and suggest <i>Patra pottali svedana/ Ruksha /Valuka Svedana</i> which helps in <i>Sthanika</i> (local) <i>Kati graha</i> .	8
	(b) <i>Kati Basti</i> works as <i>Brihmana Chikitsa</i> (Bulk-enhancing treatment modalities)/strengthens the nerves/ reduces stiffness/ helps in reducing <i>Vata</i> present in the lumbar region/ locally increases blood circulation and helps in resorption of the bulging disc and such other explanations based on a mixed understanding of Ayurveda and biomedicine	21
	2. <i>Raktamokshana/ Jaoukavacharana</i> will help for pain management (<i>sadyo Rujapaham</i> i.e., instant pain reliever) due to the removal of the <i>Avarodha</i> (obstruction) caused by vitiated <i>dosha</i> . One physician stated that this case looks like <i>apatarpanotha</i> (disease manifesting because of depletion), hence <i>Raktamokshana</i> can be avoided)	4 (6.0%)
	3. <i>Agnikarma</i> is for severe pain management.	6 (9.0%)

so. However, most of the physicians also prescribed these formulations without providing any explanation for their choice. Five physicians did not provide any explanation for their treatment approach for the given case. Two physicians explained the pathology of disturbed sperm motility because of *Vata*.

IVDP and pompholyx

Table 3 and Table 4 show a detailed analysis of Ayurveda-based patho-physiology provided by the physicians to justify their interventions for IVDP and pompholyx, as numerous responses were received on these conditions.

Additional details sought by Ayurveda physicians

In the case of anaemia, six physicians found the given details to be sufficient for finalising the diagnosis and prescription while two physicians requested additional information such as pathology reports, electrocardiogram (ECG), 2D echocardiography and patient history.

In case of IVDP, 52 physicians found the given details to be sufficient for finalising the diagnosis and prescription. However, 15 respondents requested additional details such as patient's *prakriti* (7), blood reports/ blood pressure / blood sugar report/ Rheumatoid Factor / uric acid levels (4), details

Table 4. Ayurveda pathophysiological basis provided by the physicians to justify the interventions for the case of Pompholyx (n=40).

S.No.	Explanation	N (%)
1.	<i>Nidan parivarjana</i> (03) and <i>pathya-apathya</i> (04) as a preventive measure for inhibiting the further exacerbation of the disease	7 (17.5)
2.	<i>Shodhana</i> and <i>Shamana Chikitsa</i> to pacify vitiated <i>dosha</i> <i>Kapha-Pitta</i> pacifying line of treatment <i>Pitta-Kapha</i> pacifying line of treatment <i>Pitta</i> pacifying treatment	16 (40.0) 9 (22.5) 8 (20.0)
	All <i>Kustha</i> occur due to imbalance of <i>Tridosha</i> . Hence formulations that pacify <i>Tridosha</i> are prescribed.	5 (12.5)
3.	<i>Vata-Kapha dosha</i> are vitiated and are situated in the seats of <i>Rasa</i> and <i>Kapha</i> . Hence <i>Vamana karma</i> is prescribed along with <i>Shamana Chikitsa</i>	2 (5.0)
4.	Diminished <i>agni</i> is responsible for the further vitiation of <i>dosha</i> , hence, <i>agni deepana</i> medicines along with other treatment plans are prescribed.	10 (25.0)
5.	Formulations that purify <i>Rasa/Rakta dhatu</i> are prescribed: <i>Mahamanjisthadi kwath</i> (03), <i>Swarnamashika</i> (01), <i>kaishora guggulu</i> (01), <i>Paripathadi kadha</i> (01), <i>Gandhaka Rasayana</i> (01), <i>Lakshmi vilasa Rasa</i> (01), <i>Tribhuvana Kirti Rasa</i> (01) and <i>Patoladi Kashaya</i> (01)	10 (25.0)
6.	Formulations that generally work on skin diseases and are drugs of choice for the <i>kustha</i> disease (<i>kushthaghna</i>) are prescribed	7 (17.5)
7.	Patient's habit of drinking tea and indulgence in <i>Virudhha aahara</i> (milk shakes, fish, and fast food etc), work as <i>dushi visha</i> (a type of slow poisoning) and are responsible for <i>Aama</i> production and other given symptoms. So, <i>Langhana</i> , <i>Deepana-Pachana</i> , <i>shodhana</i> and <i>Shamana</i> medicines work as a <i>Vishahara</i> (antidotes).	7 (17.5)
8.	Formulations that work as anti-inflammatory and antimicrobial are prescribed under <i>Shamana Chikitsa</i>	6 (15.0)
9.	<i>Sroto-shodaka</i> (cleansing the channels) treatment is prescribed	4 (10.0)
10.	Impaired immunity is responsible for the emerging symptoms given in the case. Hence, <i>Shamana</i> formulations which work as anti-allergic are prescribed.	2 (5.0)
11.	Local application of different formulations on the affected part (palms of both hands) to pacify <i>vitiated dosha</i> at local level. Hence topical application of different formulations is advised.	11 (27.5)

of dietary cause (6), *Upashaya–Anupashaya* (aggravating and relieving factors) (3), details of *Abhyavaharana–Jarana shakti* (1), type of *Koshtha* (4), and *Sara* (2).

In the case of Covid-19, 14 physicians found the given details to be sufficient for finalising the diagnosis and prescription, whereas six requested additional details such as treatment history, post-infection biochemistry reports, chest X-ray, *Purvarupa*, *Lakshana*, time of aggravation of fever and complexion of the patient.

In the case of pompholyx, 30 physicians found the given details to be sufficient for finalising the diagnosis and

prescription. However, 10 physicians requested more details like elaborated history and *dashavidha* (ten types of clinical examination), *ashtavidha pariksha* (eight types of clinical examination), etc.

In the case of male infertility, six physicians found the given details to be sufficient for finalising the diagnosis and prescription. However, 10 physicians said they needed more details like a detailed history (4), *ahara* and *vihara* (diet and lifestyle) (2), personal history (2), biopsy report (1) and a CT scan report of abdomen–pelvis (1). None asked for a hormone profile.

Discussion

Case scenarios

Major Ayurveda textbooks used in the present-day curricula were documented around 2000 years ago. While they contain many important and clinically relevant observations, they contain several unsubstantiated theories and imaginary concepts. They also include some faith-based components such as *Bhuta Vidya* (a branch that deals with combating the diseases produced due to “supernatural powers”). The physiology of the endocrine system is not documented in Ayurveda literature, although observations pertaining to clinical manifestations of certain probable endocrine abnormalities have been described. Similarly, the detailed structure and functions of important organs such as the kidneys, ovaries, liver, spleen etc have not been documented in the classical textbooks, even though different symptoms of various types of organ-damage have been noted. Similarly, while the clinical manifestations produced by infectious diseases have been well documented, a clear description of microorganisms is not found in Ayurveda textbooks. This limitation is obviously because advanced tools and techniques, such as microscopy and radio imaging, molecular biology, electrophysiology, genetics etc were not accessible to the ancient Ayurveda scholars. This makes the physiological and pathological concepts documented in Ayurveda rather incomplete, heuristic, and often speculative. A limitation of the present-day teaching of Ayurveda is that these concepts are projected to be irrefutable and relevant in their entirety [5, 19-21].

Our choice of the different case scenarios in this study was based on the above considerations. While anaemia has a more or less equivalent term in Ayurveda (*Pandu*), IVDP has a clinical equivalent (*Gridhrasi*) but lacks a precise explanation for pathogenesis. Both case scenarios contained sufficient information to enable a clinical diagnosis. Male infertility has been mentioned to be a result of the different problems with semen (*Shukra Dosha*) but lacks definitive causes such as hormonal and structural abnormalities. The information provided in this case scenario was not very comprehensive and we expected physicians to seek more information. Though vivid descriptions of the appearance of different skin diseases are found in Ayurveda textbooks, the patho-physiology is mainly based on the logic of *Tridosha*. We had provided a photograph of the condition and expected that diagnosis would be easy. Covid-19 being a new disease, a comprehensive description of the case was made available, and we were interested in knowing how Ayurveda physicians understood it.

Too much subjectivity

The general picture that emerges from this study indicates that there is a gross lack of consensus among Ayurveda physicians regarding a patho-physiological understanding and diagnosis of a disease based on Ayurveda principles. This is applicable to all the five cases. The treatment plans opted by different physicians varied from simple *Shamana* treatments to

complex, even multiple, *Shodhana* treatments. In many cases, a conflict regarding the usefulness of certain treatment modalities among different physicians was also evident. Further, it was expected that in case-scenarios where details about *Prakriti*, *Agnibala*, *Ritu* were already provided, the diagnosis and management would be almost similar among the physicians considering that these factors would allow for individualisation. However, in view of the wide range of interpretations of Ayurveda principles being suggested by the physicians for a given condition, it is necessary to ask, if Ayurveda interventions are indeed theory-driven and customised for individuals.

Does Prakriti form the basis of personalisation?

The concept of *Prakriti* is prioritised in Ayurveda education since it is considered an important factor in individualising treatment plans [22]. However, looking at the variations in prescription patterns received during this study, the individualisation efforts by physicians appear to be greatly subjective and without any uniformity. For example, in the case of IVDP, information on *Prakriti* was intentionally excluded, but only seven out of 67 physicians pointed out the absence of this major factor. Hence, an argument that *Prakriti* would normally determine the treatment plan appears to be wrong. Similarly, only a small number of physicians pointed out the lack of information about *Koshtha*, *Agnibala*, *Ritu* etc in the different cases that were presented.

How important is Samprapti?

According to the principles of Ayurveda, a general rule for pathogenesis (*Samprapti*) of any disease involves exposure to causative factors like erratic diet and lifestyle leading to derangement in *Agni*, vitiation of *Dosha*, disturbance in specific *Srotas*, localisation of *Doshas* at a specific location and involvement of specific *Dhatu* leading to a manifestation of symptoms. In each of the five case scenarios, although most of the responding physicians stated that they considered Ayurveda Physiology/ Pathology to be the basis of their treatment plan, the actual explanations provided by them did not support such claims. A consensus regarding the patho-physiology of these diseases among the respondents was obviously missing. For example, only 47 responses out of all 152 mentioned *Agni* as an important factor in the pathogenesis. In the case of anaemia, only one physician mentioned any *Srotas* and only four physicians mentioned the involvement of *Dhatu*. In the case of IVDP, only 15 physicians mentioned the *Srotas* involved.

Identification of the relevant Dosha

A difference of opinion among physicians regarding the site of aggravated/vitiated primary *dosha* in each of the case scenarios was also obvious. In case of pompholyx, some identified *Vata-Kapha* to be the primary *Doshas* whereas others identified either *Pitta* or *Pitta-Kapha* as the primary *Doshas*. Similarly, in the case of IVDP, most identified *Vata* as the primary *Dosha*, but some others identified *Kapha* to be the

primary *Dosha*. It is interesting to note that many physicians skipped mentioning the *Doshas* altogether. Even though many stated that they considered Ayurveda physiology, it appears that they prescribe the interventions based on the symptoms. Similarly, the identification of sub-type of *Dosha* too varied greatly among the responding physicians. For example, some considered *Apana Vata* to be involved as the specific type of *Vata* in the case of IVDP, while others identified *Vyana Vata*. This conflict is reflected in the suggested treatment plans too. For example, some physicians recommended *abhyanga* with medicated oils having *Ushna guna* (hot property) because they identified *Vata* as primary *Dosha*, while those who identified the involvement of *Pitta dosha* recommended against it. It may also be noted that the use of specific types of *Svedana* too varied considerably in this case, reflecting a conflicting understanding of *Dosha*.

Hesitation in acknowledging the use of biomedical knowledge

Out of 67 physicians who responded to the IVDP case scenario, 22 considered both Ayurveda as well as biomedicine to be the basis for finalising the treatment plan and 42 Ayurveda physicians stated that they did not consider biomedical principles. However, out of these 42, 23 physicians provided a diagnosis, based on both Ayurveda and biomedicine and two relied on biomedicine while justifying their treatment. Additionally, when asked if they needed more information regarding the case, three of them said they needed a detailed report of blood pressure, blood sugar etc. This situation indicates that most Ayurveda physicians consider a biomedicine-based diagnosis but fail to acknowledge the same. It remains to be understood if this is a conscious or subconscious decision. It is significant that five of all the respondents denied any role of Ayurveda physiology in planning their treatment schedule. Perhaps these physicians are comfortable in admitting what they do and what they do not do. Possibly, even a greater number of physicians could come up with a similar answer if probed further.

It is interesting to note that the IVDP case evoked the maximum responses (67). It is not, however, clear if this was because physicians come across such cases more frequently and, are, therefore, well acquainted with them, or because physicians found this case less challenging and easy to understand because of the associated Magnetic Resonance Imaging (MRI) report that hinted at an almost final diagnosis.

The lack of an evidence-based approach

Some published studies have claimed the usefulness of Ayurveda interventions in these clinical conditions [23-27]. However, it may be noted that none of the respondents mentioned even a single published study as influencing their interventions. None mentioned any case studies, case series, observational studies, clinical trials, or systematic reviews published in academic journals in support of their suggested treatment regimen.

Implications of the present study

It is clear from the present analysis that the treatment plans suggested by the physicians are not uniform, and are rather arbitrary. Most of these seem to arise from personal clinical experiences. There is an urgent need to document what is being practised in various clinical conditions across the country and to identify what treatment plans are actually beneficial and in which sets of patients. This could be achieved through a meticulously planned long-term observational study where a manageable number of clinical conditions can be identified, and clinicians may be asked to document those cases on a common web-based platform. Though Central Council for Research in Ayurvedic Sciences (CCRAS) has come up with an online platform named Health Management Information System (HMIS), it is not being utilised to an optimal extent [28]. This platform should be used for good prospective observational studies so that quality evidence can be generated. Without gathering good evidence, the scenario of clinical practice in Ayurveda cannot be expected to change significantly.

Need for reforms in Ayurveda education

There is an urgent need for a thorough review of the entire system of Ayurveda education and practice. As the principles of Ayurveda physiology and pathology which physicians claim to have followed vary greatly, many questions arise regarding the relevance and validity of the contents included in subjects like *Ayurveda Kriya Sharir* and *Vikriti Vijnana*. If the content being taught is not being applied in a uniform, reproducible and meaningful manner, the validity of the subject content itself becomes questionable. It has indeed been argued by earlier researchers that the current syllabi contain much outdated content with minimal-to-no clinical utility [5,19,20,21]. The results of our present study too confirm the minimal utility of teaching such theoretical constructs and strongly indicate the necessity of a thorough overhaul of the system.

Most of the pathological concepts in Ayurveda are speculative and based on the theory of *Tridosha*. This theory, though of certain clinical utility, is insufficient to explain the complex phenomena of the human body because it employs a gross-generalisation approach. This leads to oversimplification of concepts and renders the understanding of many clinical conditions difficult. Though the interventions applied by Ayurveda physicians may be based on their clinical experiences, the theoretical basis they try to provide as explanation is indeed weak. The fault may not lie with the physicians but may be rooted in the way Ayurveda is taught. In fact, Ayurveda physicians do face several dilemmas while studying and practising Ayurveda. A single concept or a single disease entity is explained differently by different teachers [29]. This situation makes it necessary for the development and implementation of standard diagnostic and treatment protocols for Ayurveda. Though the Ministry of Ayush has published such a

document in 2017, the document lacks the required information pertaining to dependable diagnosis. For example, going by the document, a physician will miss anaemia of renal origin when dealing with *Pandu*, as renal function tests have not been recommended in the diagnosis of *Pandu*. Further, the absence of an explanation based on Ayurveda pathophysiology for any disease included in the document reveals the lack of utility of such an exercise [30].

Suggested policy interventions

An urgent review of Ayurveda education and practice is needed, as differences in principles being applied create questions about the relevance of the concepts taught in subjects such as *Kriya Sharir* and *Vikriti Vijnana*. Theoretical weaknesses in physiological/pathological concepts should be acknowledged and addressed, and the Ministry of Ayush and NCISM need to take these concerns seriously and do so urgently. All the outdated content in the Ayurveda curricula needs re-evaluation and only relevant content needs to be retained. Incorporation of in-depth contemporary anatomy, physiology, biochemistry, pathology, cell and developmental biology, along with modern diagnostic methods would add value to the Ayurveda graduate programmes. Further, published literature is required to be disseminated and critically discussed among students and practitioners. This can be achieved by including major results of clinical trials and systematic reviews in textbooks and syllabi.

Limitations of the study

This study being an email-based survey, was limited to pre-defined questions, and no detailed discussion was feasible. The study does not capture the regional uniqueness that might lie in diagnosis and prescription patterns. Instead of using such case scenarios, a video-recorded patient history and findings of clinical examination from real or standardised patients could be considered in future studies. Instead of taking written responses to pre-defined questions, interviews with cross-questioning may elicit more informed responses. Further, since we sent the questionnaire to the heads of the institutions, we do not have a mechanism to ensure if they communicated it to all eligible physicians within their organisations or not. Similarly, we had shared it on some professional social media groups too. This situation makes it difficult for us to calculate the actual response rate. This is a clear limitation of our study.

Conclusion

The interventions and Ayurveda based patho-physiological basis suggested by physicians in each case varied widely, to the extent that even the identification of the relevant primary Dosh or its sub-type were in conflict. This study suggests that physicians often neglect factors like *Prakriti*, *Desha*, *Kala*, *Koshtha*, *Sara*, etc, while prescribing treatment. This situation seriously contradicts the usual claim that Ayurveda practice is holistic and individualised. The study highlights the need for standardised treatment protocols in Ayurveda, better documentation of clinical practices, and comprehensive

reforms in Ayurveda education to address weaknesses in physiological/pathological concepts. Policy interventions and further clinical research are essential to improve the efficacy and utility of Ayurveda.

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Data sharing: De-identified, unanalysed data is provided here [Supplementary file 5](#).

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