



Development, Validation and Confirmation of an Archetype Tool to Evaluate *Prakriti*

P. K. Tripathi^{1*} and S. Gehlot²

¹Department of Kriya Sharir, R. K. Ayurvedic Medical College and Hospital, Kashipur, Surai, Sathiaon, Azamgarh - 276608, Uttar Pradesh, India; dr.piyushtripathi@gmail.com

²Department of Kriya Sharir, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi – 221005, Uttar Pradesh, India

Abstract

Introduction: Notion of *Prakriti* as an indispensable concept in *Ayurveda* has attained remarkable contemplation now a day's owing to its generous effect in clinical practice. Assessment of *Prakriti* finds a way with huge inter and intra-rater variability resulting in ambiguous results. This study aims to develop a reliable *Prakriti* assessment tool. **Materials and Methods:** Many classical text books of *Ayurveda* were scrutinized scrupulously to collect the features of different *Prakriti* individuals. Features related to different *Prakriti* were kept in simple form. For statistical verification of newly designed tool; 428 students aged between 18-40 years studying different courses at Banaras Hindu University were registered. For validation; *Prakriti* assessment results of the newly designed tool was compared with other two beforehand tools functional in the Department of *Kriya Sharir*, Faculty of *Ayurveda*, IMS BHU. **Observations and Result:** A *Prakriti* evaluation tool was designed which had 43, 36 and 42 features of *Vata*, *Pitta* and *Kapha* *Prakriti* individuals in a very undemanding form. Reliability test result in the form of Cronbach's coefficient Alpha was found to be 69, 77 and 81 respectively for *Vata*, *Pitta* and *Kapha*. It shows that the newly designed tool is fairly consistent. Cohen kappa coefficient value for tool pairs is 0.51 and 0.57 that corroborate validity of new tool. **Conclusion:** Results show that newly designed *Prakriti* assessment tool amalgamates the basic construction of different *Prakritis* that can be catered with objective precision in a reproducible outcome manner.

Keywords: *Ayurveda*, *Ayurvedic* Constitution, *Prakriti* Assessment Tool

1. Introduction

Every Science carves its own pathway and its ideologies make it inimitable and distinct from other conformist disciplines of its time and of future. These indispensable concepts make a discipline, possible to withstand such slaps of time. Indian system of medicine has also covered such an extensive epoch of time, through its elementary and crucial perceptions and these ideologies of *Ayurveda* impart a distinct framework from other conventional science of this era. *Theory of Triguna*, *Panchamahabhuta*, *Tridosha*, *Sapta Dhatus* and

Prakriti etc. are certain concepts that form the basis of *Ayurveda* and also theory of *Prakriti* (constitutional types) owing to its tangible effect in clinical practice has become a matter of interest in the present state of affairs.

Prakriti a distinctive concept of *Ayurveda* finds its pavement in extraction of *Panchamahabhuta* and a step further that too into *Tridosha* (three biological humors) theory. It has made a distinct mode of its representation in the form of personalized approach of treatment than other life care delivering systems. Concept of personalized medicine is woven

*Author for correspondence

around the framework of *Prakriti*. According to *Ayurveda*, *Prakriti* (psychosomatic constitution) of an individual is formed at the brink of the conception by predominance of *Dosha* present in the *Shukra* (sperm) and *Shonita*¹ (ovum). *Acharya Charaka* belonging to the school of Indian medicine opines that it is not only prevalence of *Dosha* in *Shukra* and *Shonita* but certain epigenetic factors are also responsible for fortitude of *Prakriti*². *Prakriti* or constitutional type of an individual is not only conscientious for an individual's morphological, physiological and psychosomatic depiction but genetical specificity and distinctness from others as well. Based on preponderance of *Dosha*; *Ayurveda* classifies *Prakriti* in seven² categories; three of them are due to the predominance of single *Dosha*, three due to conglomeration of two *Doshas* and one due to assortment of all three *Doshas* in equal proportion. Cataloging of population in subdivisions on some concrete basis has remained trendy in other traditional systems as well³⁻⁵. Concept of *Prakriti* has accomplished all, embracing all due to its extensive realistic utility in upholding health. Role in diagnosis, forecasting the propensity of an individual towards a disease, prognosis of the disease, choice of drug selection, utility in therapeutics has made the notion of *Prakriti* assessment a very popular area in recent past. Its efficacy in safeguarding health by following dietetics and behavioral regimen according to one's own constitution has further fascinated interest. It has enforced clinicians and researchers of *Ayurveda* and of contemporary science as well⁶⁻⁸ to think about a new horizon of treatment unrevealed.

Acharyas have described various features to evaluate psychosomatic constitution of an individual that forms the basis for development of different *Prakriti* assessment tool by various research scholars^{6,9-11}. But *Prakriti* determination ambiguity has posed a knotty thread that needs to be addressed. Whenever we are trying to assess *Prakriti* of an individual with a tool it becomes harder to select the modus operandi to be followed¹² i.e. whether it should be interrogatory or self-assessment type and should it be based on a single discourse or multiple type. We do find that tools do not give proper magnitude to psychological attributes, while *Prakriti* of an individual is defined in terms of both somatic and mental attributes i.e psychosomatic.

Vacillation comes forth regarding selection of scoring pattern in the form of absolute or graded one. Prejudiced mind set of the physician further results in intra and inter-rater constitutional assessment variability^{13,14}. Studies show that assessment of *Prakriti* has resulted in intra and inter-rater variability not only in same institute by different physicians but by same physician for same subjects at different intervals. Lacunae of precise objective tool to assess *Prakriti* seem to be the main reason behind this.

2. Materials and Methods

2.1 Objective of the Study

Development of a new statistic validated *Prakriti* assessment tool having more objectivity so that results can be reliable and reproducible in nature.

2.2 Ethical Clearance

The study was approved by the ethical committee of IMS, BHU vide letter No.: Dean/2014-2015/EC/433, dated 18.02.2014.

2.3 Population and Sample

Volunteers for study were selected randomly from students aged between 18-40 years registered among undergraduate, post graduate and research courses of various streams in Banaras Hindu University. Only those individuals who were found clinically fit and have given their consent in written to participate voluntarily were registered. Finally, 428 volunteers were registered for the study.

2.4 Designing New *Prakriti* Assessment Tool

With an intent to develop a more objective tool nearly all important classical treatises i.e. *Charaka Samhita*¹⁵, *Sushruta Samhita*¹⁶, *Ashtanga Hridaya*¹⁷, *Ashtanga Samgraha*¹⁸, *Bhava Prakasha*¹⁹, *Bhela Samhita*²⁰, *Harita Samhita*²¹ and *Sharangadhara Samhita*²² were scanned to collect all valuable information about *Prakriti*. All the available commentaries on the *Brihat-trayi* were also searched for valuable addition in the form of information. All the above mentioned text books i. e. *Brihat-trayi*, *Laghu-trayi*, their commentaries etc were

studied verse to verse to sort out the distinct description of *Prakriti* and attributes of different *Prakriti* were collected in a non-repetitive mode. Due importance was given to psychological attributes as well. In tool each attribute related to a particular *Prakriti* was transformed to easy form so that message behind it can be clearly understood. Each attribute was allocated one mark, if present and zero, if absent i.e. absolute scoring pattern was opted. Finally number of attributes in *Vata*, *Pitta* and *Kapha Prakriti* were found to be 43, 36 and 42 respectively (Table 1). Respondents were asked to go through whole assessment tool meticulously and to allocate one mark for each attribute present in them. Percentage ascendancy of a particular *Dosha* in a person was calculated on the basis of the total scores obtained for each *Dosha* in their respective column by simple calculation as shown below:

$$\% \text{ of } \textit{Dosha} = \frac{\text{Marks scored by an individual for a } \textit{Dosha}}{\text{Total marks allotted to that } \textit{Dosha}} \times 100$$

Table 1. Showing *Prakriti* assessment tool

<i>Vata (Features)</i>	<i>Pitta (Features)</i>	<i>Kapha (Features)</i>
1. Your body is lean and thin. 2. Your body veins are prominent.		1. You are having well built body. 2. You are having long arms. 3. You are having well developed chest. 4. Your forehead is broad.
3. The colour of your skin is blackish or blackish red. 4. Your skin remains dry. 5. Your skin has a tendency to be cracked.	1. The colour of your skin is Reddish or coppery red. 2. Your body temperature generally remains on higher range of normal. 3. Your skin is having moles and freckles.	5. The colour of your skin is fair. 6. Your body temperature remains on lower range of normal. 7. Your skin is smooth and soft.
6. Your hairs remains dry. 7. Your hairs have a tendency to be cracked. 8. Your hairs are scarcely placed.	4. Your hairs are soft. 5. Your hairs are having yellowish tinge. 6. Your hairs are scarcely placed. 7. You are suffering with premature graying of hairs. 8. You are suffering with early hair fall.	8. Your hairs are black. 9. Your hairs are strong. 10. Your hairs are soft. 11. Your hairs are curly.
9. Your nails are not smooth. 10. Your nails are easily broken.	9. Your nails are copper coloured.	12. Your nails are whitish.
11. Your extremities (palm and sole) are having tendency to be cracked.	10. Your extremities are not compact.	13. Your extremities are well developed.

2.5 Statistical Verification

As it was a newly designed *Prakriti* assessment tool so it was very reasonable to have its statistical verification. Statistical verification consists of test of reliability and validity.

2.5.1 Test for Reliability / Consistency

Reliability is a measure to show how consistent the measurement is by the tool. After having data of their *Prakriti* assessment from all 428 volunteers, it was fed in the computer using the software 'Statistical Package for Social Sciences (SPSS)' (Ver. 16.0). The basic data was fed in the 'String' format and the responses to specific items were fed in 'Numerical' format. For this conversion of responses into numerical format, positive response or presence of feature was incorporated as "1" and negative response or absence of feature was incorporated as "0" for all 42 items of *Vata*, 35 items of *Pitta* and 41 items of *Kapha* except item no. V 28, P 26, and K 29 as they are having more than one options.

12. Your joints are not well covered with muscles.	11. Your joints are loose.	14. Your joints are well developed and covered with muscles.
13. Your joints produce sound during movement.		
14. Your eyes are small.	12. Your eyes become red when exposed to sun.	15. Your eyes are whitish.
15. Your eyes are dusky.		16. You are having long eye lashes.
16. Your eyes remain open during sleep.		
17. When you move with your friends they lag behind you.		17. When you move with your friends you lag behind them.
18. Is your voice considered unpleasant?	13. Do you feel difficulty in pronunciation?	18. Is your voice considered pleasant?
19. You are more talkative among your friends.	14. During discussion you become angry if individuals do not agree with your opinion.	19. During discussion you speak on any topic a. After long thinking. b. Avoid harsh words.
20. When you have been asked some questions instead of directly answering you start it with something else.		
21. Sometimes you feel hungry and sometimes not.	15. You always feel that you are very much hungry at mealtime.	20. You do not feel much hungry at meal time.
22. Sometimes you feel that meal is digested properly and sometimes not.	16. Your food is always digested properly.	21. Your food is not properly digested.
23. You consume food materials in small quantity.	17. You are not able to tolerate hunger.	22. You are able to tolerate hunger for long duration.
24. Your food intake frequency is more.	18. You consume large quantity of food.	
	19. You feel increased thirst and consume excess quantity of water.	23. You feel thirsty not so often.
	20. You suffer with excessive sweating.	24. You have less tendency of sweating.
	21. Your sweat is of foul odor.	
25. You are frequently constipated and pass hard, dried stool.	22. You pass a large quantity of stool.	25. You pass less quantity of stool.
	23. You pass excessive quantity of urine.	26. You pass less quantity of urine.
26. You desire to eat hot food.	24. You desire to eat cold food.	27. You desire to eat hot food.
27. You do not tolerate winter season.	25. You do not tolerate summer season.	28. You do not tolerate winter season.

28. You like to eat food items having below taste 1-sweet 2-sour 3- salty	26. You like to eat food items having below taste 1-sweet 2- bitter 3-astringent	29. You like to eat food items having below taste 1-spicy 2- bitter 3 -astringent
29. You feel exhausted after light exertion.	27. You feel exhausted after moderate exertion.	30. You do not feel exhausted even after heavy exertion.
30. You frequently fall ill.	28. Do you suffer more from abscess, moles, freckles etc.	31. You do not frequently fall ill.
31. You have difficulty in falling asleep. 32. Your sleep is disturbed many times.		32. You tend to have deep sleep. 33. You tend to sleep for long hours.
33. Whether you have tendency to readily initiate the assigned work.		34. Whether you have tendency to postpone the assigned work.
34. Do you have tendency to steal others belongings. 35. You are fearful in nature. 36. You tend to feel jealous about others success.	29. Do you get angry easily? 30. Do you feel confident most of the time?	35. You do not get angry easily.
37. Your grasping power is good.	31. You are considered intelligent.	36. Your retaining capacity is better than grasping power.
38. You tend to forget things easily.		37. Your retention power is good.
39. You tend to become anxious in stress.	32. You are not able to tolerate even mild stress.	38. You can tolerate even severe stress.
40. You do not feel grateful towards those who help you.	33. You tend to show mercy even on your enemies too.	39. You feel highly grateful towards those who help you.
41. You have no faith in God.	34. You have faith in God	40. You have a strong faith in God.
42. You avoid participating in competitive events.	35. You enthusiastically participate in all competitive events.	41. You enthusiastically participate in all competitive events.
43. You frequently dream of flying, climbing on mountains, trees and buildings etc during sleep.	36. You frequently dream of fire, electric thundering, red forest and sun etc during sleep.	42. You frequently dream of ponds, lakes full of lotus and swan, clouds, rivers and romantic scenes.
Total Score Vata-	Pitta-	Kapha-

Reliability test was performed in the form of Cronbach's coefficient Alpha for *Vata*, *Pitta* and *Kapha* section of the questionnaire separately except item number V 28, P 26, K 29. If value of Cronbach's coefficient Alpha appears as zero means there is an error in all the variables. If value of Cronbach's coefficient Alpha appears as 1 then, all the variables are absolutely consistent and compute the same thing. If value of Alpha appears greater than 0.7 then it is quite satisfactory and acceptable and the tool is considered as consistent²³. For *Vata b*, the value of 'Alpha if item deleted' does not alter the resultant Cronbach's Alpha value (0.69) and if the value of Cronbach's alpha is almost 0.7, the scale was considered to be reliable and consistent. Same was true for *Pitta* and *Kapha* with Cronbach's Alpha value as 0.772 and 0.819 respectively. This shows that it has fair consistency/reliability. So the newly designed tool was fairly reliable.

2.5.2 Validation of the Questionnaire

Degree, up to which a tool measure is supposed to quantify ideally, had to be validated. Since we have designed new questionnaire, therefore its validation was necessary. Validation was performed by comparing its *Prakriti* assessment results in comparison to *Prakriti* assessment results of two other *Prakriti* assessing proformas for the same volunteers, developed by Verma V, Tripathi JS, Gehlot S.²⁴ and Tripathi PK, Patwardhan K, Singh G⁶.

For validation, all the three questionnaires were distributed to all the volunteers registered for study and their *Prakriti* was assessed in terms of *Ekdoshaj Prakriti* (i.e. most dominant *Dosha*) and the data was fed into the computer using the software SPSS (Ver. 16.0). Assessed *Prakriti* was fed in 'Numerical' format. For this conversion of *Ekdoshaj Prakriti* into numerical format, the following coding pattern was used to avoid bias i.e.

Vataj Prakriti = 1 *Pittaj Prakriti* = 2 *Kaphaj Prakriti* = 3

Statistical calculation was done as cross tabulation for the newly designed proforma versus other two in the form of correctly classified cases. For validation Cohen's kappa coefficient was calculated. This is used to calculate inter-rater agreement for qualitative items. Cohen's kappa coefficient is a fairly vigorous statistical

tool to reckon the degree of conformity between different raters.

Its value is maximum 1 ($\kappa = 1$) when different tools are in complete accord. If there is no concurrence between tools then its value will be zero.

So by result we find that the newly designed *Prakriti* assessment tool correctly classifies case percent as 70% and 73% that shows good agreement between each two groups. Cohen kappa coefficient value for tool pairs is 0.51 and 0.57 that lies in fair to good quality according to Fleiss's guidelines²⁵. So we find that newly designed

Table 2. Showing results of validation test

<i>Prakriti</i> assessment tool pair	Correctly classified cases	Cohen kappa coefficient value
Newly designed tool versus Verma V, Tripathi J.S., Gehlot S ²⁴ .	70%	0.51
Newly designed tool versus Tripathi et al ⁶ .	73%	0.57

Prakriti assessment tool was fairly consistent and valid statistically (Table 2).

3. Discussion and Conclusion

Prakriti assessment has always remained a herculean task for *Ayurvedic* physicians that relentlessly affects decision making. Development of a tool that properly incorporates basic constructs of *Ayurveda* philosophy; is versatile in nature, statistically valid and reliable so that results can be reproduced in any circumstance may not only enhance the acceptability of whole system but also facilitates the scientific temperament of the subject. This study was started with an aim to develop a scientifically validated *Prakriti* assessment tool that can fit physicians need along with incorporating classical features described in texts. The tool contains 43, 36, 42 attributes of *Vata*, *Pitta* and *Kapha Prakriti* individuals in a simple form that makes it easy in catering. Results show that newly designed tool tested on a fair number of samples is reasonably reliable and valid i.e. statistically tested. Despite its confines this

study adds a step towards the decisive objective of evidence based decision making in *Ayurveda*.

4. Limitations

Despite having cheering results *prima fascia*; development of a scientifically validated tool is a time-tested course of action that incessantly needs rectification in due course of time. Unremitting effort is needed to incorporate more objective parameters in such tools to have accurate precise objective methodology of such diagnostic methods.

5. Acknowledgements

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6. Source of Support

None

7. Conflicts of Interest

Authors declare not to having any conflict of interest.

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