

DEVELOPMENT OF *SUSHRUTHA PRAKRITI* INVENTORY, AN AYURVEDA BASED PERSONALITY ASSESSMENT TOOL

Ramakrishna B R¹ Kishore K R² VaidyaV³ Nagaratna R⁴ Nagendra H R⁵

ABSTRACT:

Background: Assessment of human population based on *Prakriti* (constitution) is the first step in Ayurveda practice. Our survey amongst practicing Ayurveda doctors had established the need for a standardized *Prakriti* assessment tool. **Aim:** To develop a comprehensive tool for assessment of *Prakriti*. **Settings and design:** The tool was developed at Sushrutha Ayurveda Medical College, Bengaluru by checking (a) Content/ consensual validity by focussed group discussions (FGD) after item generation, (b) reliability by field trial on 300 healthy volunteers, correlations between subjective and objective assessment, *Cronbach's alpha* and (c) test retest reliability on 30 subjects. **Methods:** Characteristics of *Vata*, *Pitta* and *Kapha* personalities from ten authentic classics of Ayurveda were compiled. Twelve Ayurveda experts and two psychologists formed the focussed group for validation at different steps. Reliability test was done on 300 healthy volunteers; of these 30 subjects were assessed independently by 5 experts; 75 of these were retested after one month. **Results:** A total number of 861 features were pooled. By applying Edward's criteria it reduced to 490 and by applying Jackson's criteria it reduced to 99 for part 1 (self-administered) and 60 for part 2 (clinician's assessment). The version (90+60 items) that evolved after content / consensual validation by 12 experts had *Cronbach's alpha* between 0.61 to 0.80. Pearson's correlations of subjective vs objective assessment was > 0.95 and Test-retest reliability was >0.95 for all three *Prakritis*. **Conclusion:** This study has yielded a scientifically standardized tool called SPI with two parts, SPI-A with 90 questions and SPI-B with 60 items, to assess the *Prakriti* of an individual.

Key Words: Sushrutha, *Prakriti*, Inventory, Assessment.

INTRODUCTION:

Human being is a social animal and a product of social circumstances. Society influences his life and he influences the society. In the process of interaction between man and society, a kind of characteristics emerge in man, which can be considered as his way of behavior and subsequently that becomes the pattern of his life which is called personality / *Prakriti*. There are many ways of understanding and interpreting these characteristics and from time to time many scholars have tried to define personality.

Definition of personality

Theories, speculations and hypothesis have been developed across the globe, defining and assessing human behavior in terms of his unique traits and types. According to Allport, personality is the dynamic organization within the individual of those psychophysical systems that determine his unique adjustments to his environment.^[1] Personality includes three aspects of an individual viz. the psychological, biological and environmental. It encompasses those enduring characteristics which make each one unique and directs the behavior in a predictable manner in different situations and also during stressfully demanding situations. The biological aspects consisting of genetic, neurophysiologic, neurochemical and endocrinological components predispose the individual for a particular behavior that he / she may exhibit. This, in interaction with socio-cultural components

such as learning, language, religion and society influences the development of personality.^[2]

Classification of types of personality

Different cultures and schools of thoughts have put forth their concepts of personality through scientific and empirical studies. Hippocrates classified people on the basis of four bodily humours – blood, phlegm, black bile and yellow bile.^[3] Later, Sigmund Freud the father of psychoanalysis viewed personality on three aspects, i.e. the structural, dynamic and psychosexual.^[4] The structural aspects of personality include the id, ego and the super ego. The dynamic aspects contain

¹Ph.D.(Yoga) scholar, ⁴Medical Director, ⁵Chancellor. Swami Vivekananda Yoga Anusandhana Samsthana (S-VYASA) University, Bengaluru.

²Research officer, National Ayurveda Dietetics Research Institute, Jayanagar, Bengaluru.

³Deputy medical superintendent, Sushrutha Ayurveda Medical College and Hospital, Bengaluru.

Corresponding author email address:

brramakrishnasvyasa@gmail.com

Access this article online: www.jahm.in

Published by Atreya Ayurveda Publications under the license CC-by-NC.

Received on: 26/09/14, Revised on: 18/11/14, Accepted on: 23/11/14

the conscious, unconscious and defence mechanisms. The psychosexual aspect is understood in terms of the child's development in five subsequent stages. They are oral, anal, phallic, lateen and genital. Sheldon and Kretschmerweretwo scholars who classified personality on the basis of physic.^[5] Kretschmer classified people as pyknic who are fat and short.^[6] Asthenic who are bony and lean and athletic who are muscular. Sheldon gave a more complex and valid classification of personality. He found the relationship between body build and temperament. He typed individuals into endomorphic, mesomorphicand ectomorphic. In psychology, the Big Five personality traits are five broad domains or dimensions of personality that are used to describe human personality. The theory based on the Big Five factors is called the five-factor model.^[7] The five factors are openness, conscientiousness, extraversion, agreeableness, and neuroticism. According to yoga, the personality is determined by three gunas namely the satva, rajas and tamas, which are also the basic dynamic materials with which the universe is made of.

Ayurveda describes personality as *Prakriti*, a Sanskrit word that means nature or natural form of constitution of an individual. It has propounded a distinctive way of classifying the human population based on the concept of *Prakriti*. The different variants of *Prakriti* are based on the principles of tridoshas namely *Vata* (motion), *Pitta* (metabolism) and *Kapha* (structure) This concept had so far remained elusive and was looked upon as esoteric. But the work by Patwardhan et al.^[8] has opened up great interest by Modern biomedical scientists after they demonstrated a correlation between HLA alleles and *Prakriti* type. *Prakriti* is formed in the womb of the mother at the time of conception due to the predominant dosha/doshas and it determines the true nature of an individual with respect to physical, physiological and psychological dimensions for the whole life. *Prakriti* of an individual remains intact and cannot be changed throughout life but can be modified by changing one's life-style (*Ahara*-food and drinks, *Vihara*-habits and practices – *Vichara*-thoughts the basic components of Yoga) in a positive (positive health) or negative way (*vikrti*)

Prakriti is of seven types namely *Vatala*, *Pittala*, *Kaphala*, *VataPittala*, *VataKaphala*, *PittaKaphala* and *Sama Prakriti* based on the predominance of doshas. A study by Bhushan and Kalpana.^[8] has demonstrated a correlation between the tissue type HLA and *Prakriti* types to support this. Joshi et al.^[8] found a biostatistical approach to compute quantitative estimates of tridoshas in terms of accuracy of estimation with statistical confidence level above 90% that could be used for the scientific establishment of Ayurveda in a new light.

Tools

Although the traditional training of all Ayurveda physicians and students does include *Prakriti* assessment as the first and the most important step in treating a patient, there is no standardized tool available to assess *Prakriti*. There have been preliminary attempts to develop clinical tools to identify these *Prakriti* types. A few such attempts are worth mentioning: Chopra,^[9] published a brief version to help common man to assess one's own personality that has three sections i.e. *Vata*, *Pitta* and *Kapha*. The data extractable from this tool seems linear where as there is coupling seen in the

presentations of these *Prakriti*. The data extractable from Kasture's^[22] questionnaire does not seem to have sufficient stress on the higher mental predispositions. A Software that intends to measure *Prakriti* called AyuSoft,^[10] has inconsistencies in terms of close ended questions and has too many questions compromising on its user friendliness. Further, these tools have not been subjected to standard tests of validity and reliability. Our survey revealed that most of the Ayurvedic physicians use *Prakriti* assessment in their practice; many do not know the availability of standardized tools, have expressed an urgent need for such a tool and also willingness to use it. With this background the present study was planned to develop a comprehensive, user friendly, non-linear clinical instrument.

METHODS:

A group of 12 Ayurveda experts with MD and/or PhD in Ayurveda from different specialties were invited to participate in the study. Two psychologists who had experience in developing inventories were also a part of this group. Guidance was also sought from one statistician at different stages. After a signed informed consent, these experts met for focused group discussions (FGD) at each step of the study in the library of Sushrutha Ayurveda Medical College, Bengaluru, to enable referring to different texts.

In the first step of 'Item generation' all words and sentences referring to the characteristics of the three doshas were compiled by the researcher from ten authentic Ayurveda classical texts viz. *Charaka Samhita*, *Sushrutha Samhita*, *Ashtanga Sangraha*, *Ashtanga Hrudaya*, *Bhela Samhita*, *Kashyapa Samhita*, *Haritha Samhita*, *Sharngadhara Samhita*, *Bhavaprakasha Samhita* and *Yogaratanakara*.

In the second step of 'Item reduction', the number of items was reduced to 490 by deleting all repeated words as per Edward's criteria. Then the items were divided into two sets namely physical features (175) used for part 2 of the SPI and the non-physical features (315) used for construction of questions for the part 1 as a questionnaire. The discussions for the third step of 'content validity' to apply Jackson's criteria of deleting words with the same meaning resulted in 99 questions (33 each for *Vata*, *Pitta* and *Kapha*) and 60 items for physical checklist (20 each for *Vata*, *Pitta* and *Kapha*). Then the researcher sat with the two psychologists for reconstruction of the questions in acceptable English language. To establish the consensual validity the group of experts scored all these 99+60 questions on a four point scale i.e. most appropriate (score 1), appropriate (2), not appropriate (3) and not at all appropriate (4). The response bias was taken care of by avoiding interaction between the experts during validation.

After this, the initial SPI consisting of two parts, SPI-Q (Sushrutha Personality Inventory- Questionnaire), a self-administered questionnaire with 99 items that included all non-physical characteristics to be answered by the subject and, SPI-C (Sushrutha Personality Inventory Check-list) with 60 items that included all physical characteristics to be filled by the observer was available.

In the next step of reliability testing, a field study was carried out by administering the test to healthy volunteer students of both genders (139 females and 161 males) in the age range of

19 to 24 years who consented to participate in the study. They completed the self-administered SPI –Q while seated in a class room with enough gaps between them to avoid interaction. The researcher, an Ayurveda physician, interviewed each one of them individually to complete the second part, the SPI-C, which took about ten minutes for each student.

In the next step after analyzing the results of the field study and the feed back from the FGD necessary language corrections in the sentences were made with a further reduction in the number of items. Thus the final SPI evolved with part 1, (SPI-Q) consisting of 90 questions (30 each for *Vata*, *Pitta* and *Kapha*) and part 2 (SPI-C) consisting of 60 items (20 each for *Vata*, *Pitta* and *Kapha*).

Expert validation was done on 75 subjects (40 females and 35 males), randomly selected from the group of 300 students assessed during field testing. Five experts who were blind to the scores of SPI carried out *Prakriti* assessment of these 75 subjects independently (without any interaction between the experts) based on their own experience and the result sheet was kept away confidentially for correlations with the objective scores of SPI-Q and SPI-C that were already available from the initial field testing data base.

Test retest validity was checked by administering the final test material to 30 subjects randomly selected from the original population of 300 students after four weeks in the same setting.

Data analysis

Data was analysed by using SPSS-15 software. Descriptive statistics was used to obtain the percentage of students in different categories of *Prakritis*. Normality of data was checked by Kolmogorov Spirnov test. Since all data were normally distributed, percentile distribution was used to describe the number of students in *Vata*, *Pitta* or *Kapha* groups. Pearson's correlations test was used to check correlations. Cronbach's Alpha was applied to know the consistency / Reliability of items in *Vata*, *Pitta* and *Kapha*.

RESULTS:

Fig. 1 shows the results of the steps of development and validation. Phase 1 of the process of Scale Development for SPI included the following steps. (i) Item Generation/Construction that yielded 856 items, (ii) Item Reduction (conceptual validity) reduced it to 490 items, and (iii) content/consensual validity as assessed by 12 experts (deleted all those items with scores 3 and 4) which reduced it to 90 + 60 items.

Phase 2 checked the validity and reliability by (i) field testing on 300 subjects, (ii) looking at correlation between subjective assessments by 5 experts and the scores obtained from SPI on 75 subjects, (iii) Test and retest reliability by administering SPI-Q once again 4 weeks after the initial test to 30 (15 males and 15 females) selected from the original group, and (iv) calculating Cronbach's alpha for standardized and unstandardized data set from 300 samples.

Item generation:

Table-1 shows the number of items under each of the three dosha characteristics from a total of 861 items generated from 10 classical texts of Ayurveda.

Content validation

Applying Edward's criteria,^[11] the items that had same words from the ten texts were removed and 490 items were retained. Applying Jackson's criteria,^[12] the words that had similar words with same meaning were replaced by the most suitable word. The 108 items that remained were scored by 12 experts (E1 to E12 - Tables in supplementary file) on a scale of 4 (most appropriate, appropriate, not applicable and not at all applicable) independently without interaction between them to avoid response bias. Ninety nine items of SPI-Q that had scores 1 or 2 as marked by 12 experts were retained and those marked 3 (not appropriate) or 4 (not at all appropriate) were deleted. Items 1 to 33 were descriptions of *Vata* of which items 31 and 29 were marked 3 or 4 and hence were deleted. Items number 40, 52 and 61 had to be deleted from 33 of the *Pitta* questions; question number 74, 88 and 91 were deleted from the questions depicting *Kapha*. All 60 items of SPI-C were retained as there was consensus for all with scores of 1 or 2.

Phase 2- validity and reliability tests

Table 2. shows the results of the field study on 300 students (139 females and 161 males) in age range of 19 to 24 years. The mean and SD, and the range of the values for the three doshas are tabulated.

Among the 30 questions of *Vata* of SPI-Q, the lowest value was 2.0 and 3.0 for males and females respectively, and the highest was 19.0(M) and 20.0(F). Among the 30 questions of *Pitta* of SPI-Q, the lowest value was 4 for both males and females, and the highest values were 27.0(M) and 21.0(F). Among the 30 questions of *Kapha* of SPI-Q, the lowest value was 6.0 for males and 7.0 for females, and the highest values were 24.0(M) and 24.0(F).

Subjective vs. objective reliability

Results of reliability test that compared the subjective assessments by 5 experts on 75 randomly selected subjects from the pool of the original sample of 300 (used for field study) also showed highly significant correlations (r values ≥ 0.98) for V, P and K on both SPI-Q and SPI-C.

Cronbach's α test

Cronbach α (Table 3) was applied to know the consistency / Reliability of items in V, P and K. The reliability score for unstandardized items was 0.708 whereas the reliability score for standardized items was 0.734. The reliability was determined based on the following values of Cronbach's α : Not reliable = 0 to 0.40, Moderate reliability = 0.41 to 0.60, Good reliability = 0.61 to 0.80 and very High reliability = 0.81 to 1.00. Thus the present study the Cronbach's α obtained was between 0.61 to 0.80 giving good reliability of the SPI-Q inventory.

Test-retest reliability

Results of test-retest reliability statistics using Pearson's correlations on 30 randomly selected subjects (15 males and 15 females) showed r values ≥ 0.98 for V, P and K on both SPI-Q and SPI-C

Normative values of SPI

The data of 300 normal subjects in age range of 19 to 24 years were compiled by combining the scores of both parts of

the inventory and they were categorized as low, medium and high scores for the three Prakrititypes. These values were

derived by computing the reference ranges as shown in table-

Fig 1: Flow chart of the steps of development and validation of SPI.

Step1	Content generation Items from 10Ayurveda classics. <i>Vata-277, Pitta-272, Kapha-312.Total-861</i>
--------------	---



Step 2	Item reduction(Edward’s Criteria) <i>Vata-157,Pitta 142,Kapha-191,Total-490</i> Physical-175 non- physical- 315
---------------	---



Step 3	Content validity(Jackson’s criteria)	
	Part 1 -99 <i>V-33, P-33, K-33</i>	Part 2- 60 <i>V-20, P-20, K-20</i>



Step 4	Consensual validity- 12 experts Scoring on 4 point scale	
	Final Part 1 - SPI-A <i>V-30, P-30.K-30</i>	Final Part 2 - SPI-B <i>V-20,P-20,K-20</i>



Phase 2	Reliability – field testing - 300 healthy volunteers
	Test retest reliability – 75 from the same set
	Expert validation - 30 from the same set
	Cronbach’s alpha



Phase 3	Normative values of V,P, K, for males and females
----------------	--

Fig. 2:

Table 1: Number of features of different types of Prakriti from 10 Ayurveda classics

No.	Authors	Vata	Pitta	Kapha	Total
1	Charaka samhita	58	54	38	150
2	Sushruta samhita	33	32	38	103
3	Astanga hridaya	51	55	80	186
4	Astanga sangraha	55	61	71	187
5	Sharangadhara samhita	06	05	05	16
6	Bhavaprakasha samhita	09	08	06	23
7	Harita samhita	18	14	21	53
8	Bhela samhita	19	21	29	69
9	Yogaratanakara	17	11	13	41
10	Kashyapa samhita	11	11	11	33
	Total	277	272	312	861

Table 2 : Range and mean values for V,P K in 300 healthy volunteers

Test	Groups	Category	VATA	PITTA	KAPHA	
SPI-A	Total	Range	5.60-20.64	4.38-20.72	4.93-20.69	
		Mean ±SD	10.17± 3.85	12.83 ± 4.00	15.56 ± 3.84	
	Males	Range	2.54-17.77	5.60-20.64	8.47-22.78	
		Mean ±SD	10.16 ± 3.88	13.12 ± 3.84	15.63 ± 3.65	
			Normality (P)	0.302	0.135	0.529
	Females		Range	2.68-17.71	4.38-20.72	7.58-23.40
			Mean ±SD	10.19 ± 3.83	12.55 ± 4.17	15.49 ± 4.04
			Normality (P)	0.076	0.194	0.228

Table 3: Reference range for V , P and K based on SPI-A (30 each for V, P, K) and SPI-B (20 each for V, P, K)

	VATA	PITA	KAPHA
Sample size	300	300	300
Lowest value	2.0	6.0	8.0
Highest value	30.0	32.0	39.0
Mean	14.29	17.28	23.1
Median	14.00	17.00	23.0
SD	4.62	4.97	5.57
Co-efficient of Skewness	0.45	0.22	-0.015

Co-efficient of kurtosis	0.50	0.31	-0.038
D'Agastino Pearson test for Normal distribution	0.002**	0.154	0.958
Normality	Not Normal	Normal	Normal
90% Reference Interval	7.50-22.00	9.10-25.5	13.8-32.2
Interpretation			
Low	<7.50	<9.1	<13.8
Medium	7.50-22.00	9.1-25.5	13.8-32.2
High	>22.0	>25.5	>32.2

Based on the values for low (L), medium (M) and high (H) scores for V, P and K, classification of these 300 subjects was done with 27 combinations (table 3). 70% (210 subjects) of the population had Medium V, P and K indicating that these were completely normal and the remaining 30% (90 subjects) had variations in *Prakriti* distributed amongst other 26 combinations. Among 139 males and 161 females (100%), 96 males and 114 females (70%) were in the Medium V,P and K and remaining 42 males and 48 females (30%) were in other categories of *Prakriti*. A few examples of the percentage of subjects in different combinations are: (i) 0% in category Low *Vata* (VL) + low *Pitta* (PL) + low *Kapha* (KL) (ii) 0.7% in category VL+ PL + KM ; (iii) 0% in category VL + PM + KH ;(iv) 0.3% in VL + PM + KL ;(v) 3.0% in VL + PM + KM; (vi) 0.3% in VL + PM + KH; (vii) 0.0 % in VL + PH + KL; (viii) 0.7% VL + PH + KM.

DISCUSSION:

In this study, ten authentic classics of Ayurveda were selected as the source for item generation. Focussed group discussions by 12 Ayurveda experts and two psychologists was carried out to evolve a standardized tool called SPI with two parts, namely SPI-Q with 90 questions that includes the Physiological, Psychological, Social, Intellectual and Spiritual domains and SPI-C with 60 items to assess the physical characteristics of *Prakriti*. A strong reliability was found between SPI-Q with experts' subjective assessment scores for

>0.95; correlations between SPI-C and experts' subjective assessment score were also highly significant with r values > 0.95. There was also highly significant Test – retest reliability. Chronbach's alpha was also highly significant with a values >0.95 for V,P,K of both SPI-Q and SPI-C.

Comparisons

The literary survey of the selected classics revealed that there are significant differences among the authors to describe different features of *Prakriti* with respect to different domains. *Charaka* being the authority of medicine has not given any features of *Prakriti* in relation to the spiritual domain, *Sushruta* and *Vagbhata* have given importance to analogies while describing the features of *Prakriti* they seemed to believe that *Upamana* (analogy) is the best method of understanding the highest truth. All the authors have given due importance to physical, physiological and psychological domains. *Harita*, *Sharangadhara*, *Bhavaprakash* and *Kashyapa* have not considered the social domain while *Sharangadhara* and *Kashyapa* have not given any consideration to spiritual domain. This may be due to the fact that the *Kashyapa* has been an expertise on paediatrics and *Sharangadhara* has been an authority on pharmacy and pharmaceuticals. The table 7 below gives the details of the number of items available in different texts on different domains.

Sl. no	Domains	Number of items obtained from ten classical texts										
		1* CS	2 SS	3 AH	4 AS	5 BS	6 HS	7 BpS	8 SdS	9 YR	10 KS	Total
1	Physical	57	40	56	60	22	20	11	7	9	6	288
2	Physiological	67	15	53	57	14	9	5	2	7	25	254
3	Psychological	18	26	46	48	24	21	5	4	13	2	207
4	Intellectual	4	9	8	9	5	0	1	3	5	0	44

5	Spiritual	0	3	9	6	2	3	1	0	2	0	26
6	Social	4	7	10	7	2	0	0	0	5	0	35
7	Analogies	0	3	4	0	0	0	0	0	0	0	7
	Total	150	103	186	187	69	53	23	16	41	33	861

Abbreviations: CS - *Charaka* Samhita, SS - *Sushruta* Samhita, AH - *Astanga Hridaya*, AS - *Astanga Sangraha*, BS - *Bhela* Samhita, HS - *Haritha* Samhita, BpS - *Bhavaprakasha* Samhita, SdS - *Sharangadhara* Samitha, YR - *Yogaratakara*, KS - *Kashyapa* Samhita.

Comparisons of tools in English language

There are a few existing tools in English language that are available which are very popular. Chopra, in his popular book 'Perfect health' published a brief version of *Prakriti* assessment tool to help common man to assess one's own personality that has three sections i.e. *Vata*, *Pitta* and *Kapha*. The data presented in this tool is linear and not clear in the presentations of the *Prakritis*. The data extractable from Kasture's (1997) questionnaire, although non-linear, it does not seem to have sufficient stress on the higher mental

predispositions. Athavale (2004) seems to have just listed the attributes of *Prakriti* which cannot be effectively used as a tool. A software that intends to measure *Prakriti* called AyuSoft, seems to have inconsistencies in terms of close ended questions and there are too many questions compromising on the user friendliness of the instrument.

Further, these tools have not been subjected to any of the standard tests of validity and reliability. The table below gives a comparison of all available tools. Table 16 below gives a comprehensive comparison of all available tools

Table 5: Comparison of different tools available for assessment of *Prakriti*

Sl. no.	Title and reference	Total number and aspects covered	Comments
1	Development and standardization of Mysore psychological Tridosha scale (2011) ⁽¹⁶⁾	The authors have developed a personality scale to assess Tridoshas i.e. <i>Vata</i> , <i>Pitta</i> , and <i>Kapha</i> from psychological perspective in human beings.	Physical and physiological components are ignored
3	Development and validation of a Prototype <i>Prakriti</i> Analysis Tool (PPAT); Inference from pilot study (Ayu, april 2012) ⁽¹⁷⁾	The present study aims to develop a prototype <i>Prakriti</i> analysis tool and its evaluation on inter-rater validity grounds. The study observes that <i>Vata</i> and <i>Pitta</i> constructs of <i>Prakriti</i> identification in Ayurveda have a significant inter-rater correlation ($P < 0.001$ and $P < 0.01$), whereas <i>Kapha</i> has less ($P < 0.02$) correlation.	A pilot prototype study, study is confined to only <i>Charaka</i> - Samhita
4	Diets based on Ayurvedic constitution-potential for weight management (Alternter health med .2009) ⁽¹⁸⁾	A retrospective study was conducted to determine the effectiveness of Ayurvedic constitution-based diets on weight loss patterns of obese adults.: Records of 200 obese adults, both male and female, who had completed 3 months of the diet therapy at Ayurvedic clinics, were examined and data collated	Not used a standardized tool
5	EGLN1 involvement in high altitude adaptation revealed through genetic analysis of extreme constitution types defined in Ayurveda ⁽¹⁹⁾	In the present study, a link between high-altitude adaptation and common variations rs479200 (C/T) and rs480902 (T/C) in the EGLN1 gene. Furthermore, the TT genotype of rs479200, which was more frequent in <i>Kapha</i> types and correlated with higher expression of EGLN1, was associated with patients suffering from high-altitude pulmonary edema,	Research oriented study

6	Whole genome expression and biochemical correlates of extreme constitutional types defined in Ayurveda ⁽²⁰⁾	<i>Prakriti</i> analysis software with 23 questions in 5 domains.	80% concordance between clinical and software analysis. No items for objective assessments No standardization
7	Self-rating AyuSoft software and developed by Bhushan Patwardhan and team with collaboration from CDAC (2006)	With C-DAC, Dr. Patwardhan has conceptualized an innovative project named AyuSoft, which has been supported by the Ministry of Information Technology. The first version of AyuSoft as a decision support system	No standardization
8	Deepak Chopra's body type questionnaire, ⁽²¹⁾ (1994)	20 Q each for vata pitta kapha -	Not standardized
9	Self-rating Kasture's <i>Prakriti</i> (textbook) 1991 ⁽²²⁾	22 Q, combined for V, P & K,	No distinct subjective and objective measures No standardization
10	<i>Prakriti</i> software by FRLHT http://www.frlht.org/clinic/index.htm .	A software developed by FRLHT	No standardization
11	Development of Dhanavantari personality inventory based on tridosha with respect to <i>Ahara, Vihara</i> and <i>Vichara</i> ⁽²³⁾ (2006)	60 questions combined for V, P & K external validity; content validity; cross validity; test retest reliability checked.	No items for objective assessment. Significant validity and reliability demonstrated. No inter-rater reliability. Unpublished
12	The human constitution by Vasant Lad ⁵ (1998)	Has 20 subjects with three columns for VPK	Not standardized
13	A Biostatistical Approach to Ayurveda: Quantifying the Tridosha ⁸ (2004)	Questionnaire for statistical modelling of Ayurvedic diagnostic factors Has 28 items with 3 options for each (VPK).	No evidence of standardization
14	<i>Prakriti</i> pareeksha -RGUHS syllabus (1992)	Has 26 items with 3 columns (VPK)	Included in the curriculum of BAMS degree No evidence of standardization
15	Tridosha questionnaire – Vivekananda Yoga Anusandhana Arogyadhama (2000)	Has 60 questions (V20, P20 & K20) with triple scoring pattern	Scoring pattern is not uniform No standardization
16	Diagnostic test for <i>Prakriti</i> - Ayurveda Holistic online.com (AICBS, inc. (2006)	Has 4 parts with 58 items with 3 options	No standardization
17	Ayurvedic Constitution Chart – David Frawley ⁽²⁴⁾ (2001)	A table of 29 items with 3 options for VPK questions in statement form	No standardization

CONCLUSION:

This study has resulted in an administrable tool (SPI-Q and SPI-C) comprising both subjective (90 questions) and objective (60 checklist) methods for assessment of *Prakriti* based on the concept of tridosha, the most fundamental theory of Ayurveda. It depicts the real nature of different types of *Prakriti* postulated by different authors.

Limitations of the study

The reliability test in phase two has used healthy volunteers from one age group in one area of India. Hence the normative values may not be applicable for all populations. The focussed group of experts could have included consultants from modern medicine.

Suggestions for future work

Studies to define the normative values in different age groups and in different cultures need to be planned. Factor analysis to define different domains of the tool is recommended. Future work to define the disturbances in *Prakriti* in different disease states is the next step to understand the scriptural knowledge in the light of modern medicine. Development of tools for assessment of Agni and Aama status in health and disease will provide more authentic and holistic assessments to pave way to developing standardized therapeutic protocols of Ayurveda.

Strengths of the study

This tool developed by using modern methods of validation and standardisation is the first attempt that has offered

authentic toll for use by the medical professionals in general and the Ayurveda community in particular. Determining the personality based on Tridoshas adds new dimensions to modern system of medicine to recommend specific life-style changes with/ without medications for prevention and cure of diseases and promotion of positive health.

REFERENCES:

1. Ian Nicholson, *Inventing Personality: Gordon Allport and the Science of Selfhood*, American Psychological Association, 2003, ISBN 1-55798-929-X
2. Singer, MiltonLeVine, R.A.2001 Culture and Personality Studies 1918-1960. *Journal of Personality*. 69:6, 803-818
3. Hippocrates Collected Works I. Hippocrates. W. H. S. Jones. Cambridge. Harvard University Press. 1868.
4. Sigmund Freud and Lou Andreas-Salome; *Letters*, Publisher: Harcourt Brace Jovanovich; 1972, ISBN 978-0-15-133490-2
5. Sheldon, William H. *The Varieties of Human Physique (An Introduction to Constitutional Psychology)* ♦ Harper & Brothers, 1940
6. Authur S. Reber- *Dictionary of Psychology*, Penguin p.690 (1995) (FFM).[2014]
7. Bradshaw, S. D. (1997). Impression management and the NEO five factor inventory: Cause for concern? *Psychological Reports*, 80, 832-834.
8. Joshi RR. Abiostatistical approach to Ayurveda:quantifying the tridosha. *J Altern Complement Med*, (2004) 10(5):879-8
9. Chopra D *Positive health*. New York: Crown publishers.1994
10. Bhushan. Patwardhan vAyusoft software; CDAC(2006
11. Arora D, Kumar M.Food allergies-leads from Ayurveda. *Indian J med sci*, .(2003)57(2): 59-63.
12. Jackson(1970,1971,1973,1984:Jackon and Reddon1987)
13. Sharma S, Puri S, Agarwal T, Sharma V.D diets based on Ayurvedic constitution--potential for weight management.*Alternther health mdcn*2009 Jan-Feb;15(1):44-7.
14. AggarvalsNegi S, Jha P, Singh PK, Stobdan T, Pasha MA, Ghosh S, Agrawal A; Indian Genome Variation Consortium, Prasher B, Mukerji MEGLN1 involvement in high-altitude adaptation revealed through genetic analysis of extreme constitution types defined in Ayurveda. "ProcNatlAcadSci U S A."[jour] 2010 Nov 2;107(44):18961-6. doi: 10.1073/pnas.1006108107. Epub 2010 Oct 18.
15. Shilpiagaval, sapnanegi, Bhavana Prasher genomics and molecular medicine, institute of genomics and integrative Biology, CSIR, Newdelhi;Whole genome expression and biochemical correlates of extreme constitutional types defined in Ayurveda*Jtrans Medicine*.2008
16. H.S. Kasture. ; *PrakritiShree BaidyanathAyurvedaBhavan*, 1991 - Health - 210 pages
17. Vaidya V; Self rating subjective questionnaire MSc thesis submitted to SVYASA, (2007) 24)
18. David Frawley , Sandra Summerfield Kozak, *Yoga for your Type* (2001)

Cite this article as: Ramakrishna B R, Kishore K R, VaidyaV, Nagaratna R, Nagendra H R. Development of Sushruta *Prakriti* Inventory, an Ayurveda based personality assessment tool. *J of Ayurveda and Hol Med (JAHM)*.2014;2(8):6-14.

Source of support: Nil, Conflict of interest: None Declared