



Research Article

DEVELOPMENT AND VALIDATION OF AN ASSESSMENT TOOL TO EVALUATE THE STATUS  
OF *KAPHA* IN *TAMAKA SWASA*

Sneha. S<sup>1\*</sup>, Priya. S<sup>2</sup>, Darshna H Pandya<sup>3</sup>

\*<sup>1</sup>PhD Scholar, <sup>3</sup>Professor & Head, Department of Roga Nidana and Vikriti Vigyan, ITRA Jamnagar.

<sup>2</sup>Associate Professor, Department of Roga Nidana and Vikriti Vigyan, Government Ayurveda College, Thiruvananthapuram, Kerala, India.

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ABSTRACT

Classical textbooks of Ayurveda states that *Tamaka Swasa* is a *Kapha* predominant disorder. Since there is a lack of direct assessment tool for assessing the status of *Kapha Vridhi* in *Tamaka Swasa*, a study is needed to develop an assessment tool. **Methods:** Initially, 165 symptoms of *Kapha* vitiation were collected from different Ayurvedic classics. After comparing the *Tamaka Swasa* features, 112 items were selected by the researcher in which 54 of them were found repeating. Finally, 58 attributes were scrutinized and presented before 10 experts. 28 items were fixed after analysing expert opinion. Pilot study was conducted in 10 patients using these items as draft tool. 3 items were found skewed and deleted from draft tool. Then it was administered in sample population of 126 subjects in which 63 were with *Tamaka Swasa* and 63 healthy controls. Later 25 items were subjected to exploratory factor analysis and items were reduced to 21. **Result:** Under Reliability check, Intraclass correlation coefficient for both Test-retest (0.719) and Inter-rater reliability (0.802) were excellent. KMO (Kaiser-Meyer-Olkin) measure (0.878) and Bartlett's test of sphericity p-value (0.000) ensured data suitability for factor analysis. Results of Mann-Whitney U test (0.000), Z-score (-9.687) suggested strong discriminant validity for tool. Agreement statistics was done in place of criterion validity due to unavailability of a gold standard. Kappa value of 1.000 indicated perfect agreement between raters. Data reduction was done by checking Cronbach's alpha, by which 4 items were deleted and 21 items retained as the final tool. **Discussion:** The developed 21-item *Kapha* assessment tool demonstrated acceptable validity and reliability, indicating its suitability for standardized clinical assessment in patients with *Tamaka Shwasa*. It may support the evaluation of *Kapha dushti* severity and aid therapeutic decision-making in Ayurveda practice. **Conclusion:** The final tool is available in Sanskrit, Malayalam and English languages and can be used by Ayurveda students or physicians for evaluating *Kapha Dosha* in a *Tamaka Swasa* patient.

INTRODUCTION

Ayurveda, the science of life, is based on the unique concept of *Tridosha* theory. *Vata* (The dynamic force), *Pitta* (The transformation factor) and *Kapha* (The anabolic factor) are the three *Doshas* that maintain normal functioning of the body. It can also destroy the body if it gets vitiated [1]. Each individual has a unique balance of all three *Doshas*.

*Kapha* provides stability, unctuousness and forbearance. Unvitiating *Pitta* helps with functions such as digestion and metabolism, temperature, vision, hunger, thirst, taste, luster, retention of memory, intelligence, strength and delicateness of body. *Vata* blesses the body by governing functions like enthusiasm, expiration, inspiration, motor activities of the body, regulation of natural urges, regulation of proper nourishment of tissues and regulation of functions of the sense organs. Ayurveda revolves around three *Doshas*, as it has a vital role in diagnosis and treatment.

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*Tamaka Swasa* is a chronic respiratory disease caused by the obstruction of *Pranavayu*<sup>[2]</sup>. This obstruction is due to an increase in *Kapha Dosha*. Prevalence of *Tamaka Swasa* seems to be ascending due to various factors like pollution, seasonal changes, and external stimuli like dust, cold, genetic predisposition, smoking, etc. Over the past centuries, *Tamaka Swasa* has remained a challenging and unrelenting disease and thus continues to be a distressing and alarming disease in the present world. Ayurveda uses personalized treatment protocol for every individual, foreseeing the variations in the status of *Doshas* in each and every disease. Even though all treatises of Ayurveda are completely filled with subjective descriptions of *Tridoshas*, a direct assessment scale for finding the same is unavailable. Though Ayurveda offers effective management strategies for chronic diseases, the lack of scientific validation keeps this science unrecognized and unaccepted.

To get the clarity and objectivity of the status of *Doshas*, it is necessary to develop and validate user friendly assessment tools. Taking this into consideration, the study "Development and Validation of Assessment Tool to Evaluate the Status of *Kapha* in *Tamaka Swasa*" was carried out.

## MATERIALS AND METHOD

Attributes of *Kapha* were collected from *Brihatrayees*, *Laghutrayees*, and *Kashyapa Samhita*. The precise meanings and conceptual depth of each attribute were critically studied. The precise meanings and conceptual depth of each attribute were critically examined. Expert consultations were conducted with academicians from three government Ayurveda colleges in Kerala to analyse the various dimensions of the attributes and ensure conceptual clarity.

Following conceptualization, Item generation was undertaken. A total of 165 attributes of *Kapha Dosha* were generated after review of literature, expert opinion and clinical experience<sup>[3,4,5]</sup>. Upon comparing the features of *Tamaka Swasa* with the identified *Kapha* attributes, 112 items were shortlisted<sup>[3,4,5]</sup>. From this, 54 repetitive items were deleted afterwards. The 58 items, along with their questionable format (in the local language too), were given to 10 subject experts from different Government Ayurveda colleges, Kerala, for content validation and item selection. The experts were requested to assign a weightage score to each item using a six-point Likert scale based on their clinical experience, where 0 = Never, 1 = Very rarely, 2 = Rarely, 3 = Sometimes, 4 = Mostly, and 5 = Always. The expert panel was also requested to report confusing and biased questions. 28 highest-scored items were retained. These selected items were then worded in simple sentence format to suit the level of comprehension of the target population. Later, the

items were sequenced to ensure logical flow and respondent engagement. The tool employed an ordinal level of measurement using a Likert scale, with equal weightage assigned to all items to ensure clarity, interpretability, and actionability. For linguistic validation, a bilingual translator proficient in Malayalam and English translated the tool into Malayalam. Another language expert, blinded to the original version, translated the Malayalam version back into English. Then, the original English version and the back-translated English version were compared to ensure semantic equivalence and to confirm the intended meaning was preserved. Pretesting was done among peer group, respondent population, and expert panel to assess whether the items were understood and interpreted well or not.

With the drafted tool, Pilot study was conducted among 10 subjects at Government Ayurveda college hospital, Kannur. Informal interviews with the sample population was carried out and were asked to think aloud and raise questions if any. Each time, they were instructed to tell the investigator exactly what comes in their mind. The problems pointed out were noted down for discussion with experts. The responses were scored as per the Likert scale, and the data were entered in the excel sheet. From draft tool, 3 items (*Madhura*, *Praseka*, *Aavila*) was found skewed and therefore deleted.

Test-retest reliability and Inter-rater reliability check carried out to know how the time gap affects the repeatability of response and the consistency among rates. The draft tool was administered on the same person on 2 different occasions with a time gap of 15 days for test-retest reliability and to test the consistency among raters, the draft tool was administered to 10 subjects on the same day by two raters. The scores of the two occasions were notes and correlated.

The final administration of the tool was carried at the Government Ayurveda college Hospital, Kannur. The draft tool containing 25 items were administered by the researcher upon 126 subjects in which 63 were with *Tamaka Swasa* and 63 were healthy<sup>[9]</sup>. Patients aged between 20 and 70 years presenting with the classical signs and symptoms of *Tamaka Shwasa* as described in Ayurvedic treatises and willing to provide written informed consent were included in the study. It took a period of three months (01/09/2019–30/11/2019) for the completion of final administration of the tool. The data obtained after completion of final administration was entered in the excel sheet.

Construct validity of the tool was assessed with four step Explanatory Factor Analysis was followed for selection of factors. Initially, the suitability of the data for factor analysis was evaluated by assessing

sampling adequacy and factorability using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s Test of Sphericity. Factor extraction was performed using Principal Component Analysis (PCA). The criteria adopted for factor extraction and item selection included the Kaiser criterion, cumulative percentage of variance extracted, communalities, and scree plot. Promax rotation was applied to achieve better interpretability of the extracted factors.

Discriminant validity of the tool was evaluated by Mann-Whitney U test. In the absence of an established gold standard external criterion and due to

insignificant sensitivity observed in 2×2 table analysis, agreement statistics were employed in place of criterion validity. Interrater agreement was assessed using Cohen’s kappa ( $\kappa$ ) statistic.

Cronbach’s alpha for each item is listed out first for internal consistency reliability [10]. Items with very low Cronbach’s alpha are eliminated one item at a time, to identify the items with significantly high alpha. Based on this analysis, four items – *Upadeha*, *Manda*, *Guru* and *Styāna* were removed, and a final tool comprising 21 items was generated [11].

### Item generation and reduction process

| Stage                                                                                                    |     |
|----------------------------------------------------------------------------------------------------------|-----|
| Initial <i>Kapha</i> attributes generated from literature review, expert opinion and clinical experience | 165 |
| Items matching features of <i>Tamaka Swasa</i>                                                           | 112 |
| Repetitive items removed                                                                                 | 54  |
| Items subjected to content validation                                                                    | 58  |
| Final items retained after expert validation                                                             | 28  |

**Table 1: Test-retest reliability statistics of the tool**

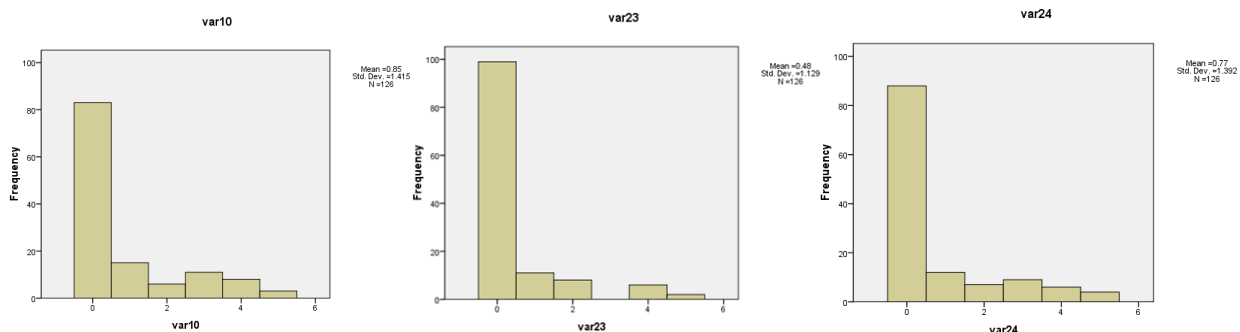
| Reliability statistics |                                    |                         |
|------------------------|------------------------------------|-------------------------|
| No of Items            | Intraclass Correlation Coefficient | 95% Confidence Interval |
| 28                     | 0.719                              | 0.787 – 0.955           |

**Table 2: Inter-rater reliability statistics of the tool**

| Reliability statistics |                                    |                         |
|------------------------|------------------------------------|-------------------------|
| No of Items            | Intraclass Correlation Coefficient | 95% Confidence Interval |
| 28                     | 0.802                              | 0.787 – 0.955           |

### Pilot study result

The 28-item draft tool was subjected to pilot testing. Three items were found to have highly skewed responses and were therefore removed.



### Factor analysis and Item reduction

Suitability for Factor analysis, KMO value found to be 0.878.

**Table 3: KMO and Bartlett’s Test**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                    | 0.878   |
|-------------------------------------------------|--------------------|---------|
| Bartlett’s Test for Sphericity                  | Approx. Chi-square | 3.481E3 |
|                                                 | Df                 | 300     |
|                                                 | Sig.               | 0.000   |

Extraction of factors using Principal Component Analysis (PCA)

**Table 4: Communalities**

| S.No                                            | Item  | Initial | Extraction |
|-------------------------------------------------|-------|---------|------------|
| 1                                               | Var1  | 1.000   | .889       |
| 2                                               | Var2  | 1.000   | .916       |
| 3                                               | Var3  | 1.000   | .751       |
| 4                                               | Var4  | 1.000   | .708       |
| 5                                               | Var5  | 1.000   | .844       |
| 6                                               | Var6  | 1.000   | .734       |
| 7                                               | Var7  | 1.000   | .544       |
| 8                                               | Var8  | 1.000   | .637       |
| 9                                               | Var9  | 1.000   | .869       |
| 10                                              | Var11 | 1.000   | .617       |
| 11                                              | Var12 | 1.000   | .895       |
| 12                                              | Var13 | 1.000   | .769       |
| 13                                              | Var14 | 1.000   | .580       |
| 14                                              | Var15 | 1.000   | .564       |
| 15                                              | Var16 | 1.000   | .817       |
| 16                                              | Var17 | 1.000   | .787       |
| 17                                              | Var18 | 1.000   | .689       |
| 18                                              | Var19 | 1.000   | .754       |
| 19                                              | Var20 | 1.000   | .624       |
| 20                                              | Var21 | 1.000   | .746       |
| 21                                              | Var22 | 1.000   | .626       |
| 22                                              | Var25 | 1.000   | .674       |
| 23                                              | Var26 | 1.000   | .912       |
| 24                                              | Var27 | 1.000   | .684       |
| 25                                              | Var28 | 1.000   | .690       |
| Extraction Method: Principal Component Analysis |       |         |            |

**Table 5: Total variance explained, Percentage variance and cumulative percentage variance of 25 item draft tool**

| Total variance explained |                     |               |              |
|--------------------------|---------------------|---------------|--------------|
|                          | Initial Eigenvalues |               |              |
| Component                | Total               | % of Variance | Cumulative % |
| 1                        | 13.408              | 53.633        | 53.633       |
| 2                        | 2.101               | 8.403         | 62.036       |
| 3                        | 1.611               | 6.443         | 68.479       |
| 4                        | 1.197               | 4.786         | 73.265       |
| 5                        | .962                | 3.850         | 77.115       |
| 6                        | .864                | 3.455         | 80.570       |
| 7                        | .719                | 2.874         | 83.444       |
| 8                        | .610                | 2.441         | 85.885       |
| 9                        | .548                | 2.191         | 88.076       |

|    |      |       |         |
|----|------|-------|---------|
| 10 | .512 | 2.050 | 90.125  |
| 11 | .387 | 1.547 | 91.673  |
| 12 | .335 | 1.340 | 93.012  |
| 13 | .297 | 1.188 | 94.200  |
| 14 | .247 | .987  | 95.187  |
| 15 | .234 | .936  | 96.123  |
| 16 | .199 | .794  | 96.917  |
| 17 | .146 | .585  | 97.503  |
| 18 | .137 | .546  | 98.049  |
| 19 | .123 | .490  | 98.540  |
| 20 | .112 | .448  | 98.987  |
| 21 | .104 | .417  | 99.404  |
| 22 | .063 | .251  | 99.655  |
| 23 | .041 | .164  | 99.819  |
| 24 | .027 | .108  | 99.926  |
| 25 | .018 | .074  | 100.000 |

Exploratory factor analysis generated a component matrix of Eigenvalue more than 1 and the component matrix showing the number of factors and factor loading of each item is given in the table below

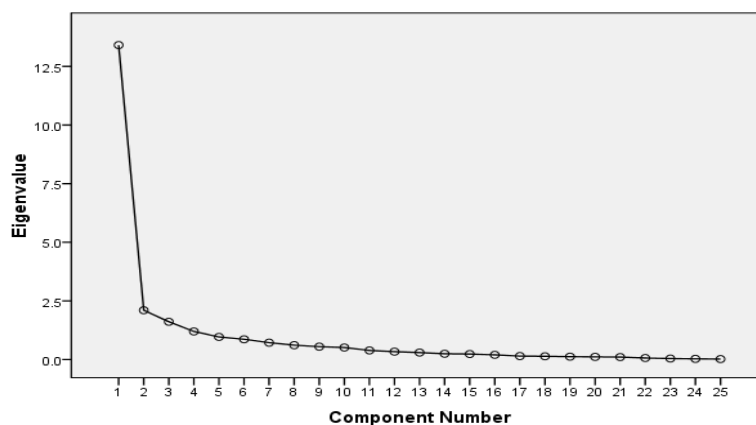
**Table 6: Component matrix of 25 items draft tool**

| Component Matrix |            |       |       |       |
|------------------|------------|-------|-------|-------|
| Items            | Components |       |       |       |
| Var2             | .949       | -.027 | -.075 | -.099 |
| Var26            | .943       | -.098 | -.074 | -.080 |
| Var1             | .928       | -.081 | -.102 | -.099 |
| Var11            | .925       | -.005 | -.188 | .056  |
| Var9             | .881       | .104  | -.227 | .173  |
| Var16            | .856       | -.066 | .194  | -.205 |
| Var3             | .844       | -.037 | -.183 | .069  |
| Var5             | .844       | .012  | -.270 | -.244 |
| Var17            | .843       | .029  | .008  | -.275 |
| Var4             | .836       | -.041 | -.088 | .010  |
| Var12            | .810       | .240  | -.176 | -.153 |
| Var19            | .801       | -.324 | -.065 | .063  |
| Var7             | .724       | .126  | .061  | .013  |
| Var27            | .685       | -.396 | -.031 | .238  |
| Var28            | .678       | -.421 | .005  | .229  |
| Var8             | .665       | .397  | .180  | .069  |
| Var13            | .652       | .002  | .045  | .390  |
| Var6             | .630       | .574  | .061  | .049  |
| Var18            | .615       | -.525 | .184  | -.033 |
| Var24            | .598       | .335  | -.009 | .452  |
| Var15            | .588       | .328  | .061  | -.326 |

|                                                 |      |       |      |       |
|-------------------------------------------------|------|-------|------|-------|
| Var21                                           | .352 | .644  | .453 | -.045 |
| Var20                                           | .306 | -.186 | .676 | -.195 |
| Var23                                           | .274 | .000  | .550 | .498  |
| Var10                                           | .411 | -.346 | .519 | -.243 |
| Extraction Method: Principal Component Analysis |      |       |      |       |
| a. 4 components extracted.                      |      |       |      |       |

**Screen plot**

Scree Plot

**Factor Loading****Table 7: Structure matrix of draft tool**

| Structure matrix |            |      |       |       |
|------------------|------------|------|-------|-------|
|                  | components |      |       |       |
|                  | 1          | 2    | 3     | 4     |
| Var26            | .949       | .515 | .305  | .106  |
| Var2             | .944       | .574 | .279  | .084  |
| Var1             | .935       | .518 | .280  | .073  |
| Var11            | .935       | .534 | .117  | .174  |
| Var9             | .882       | .562 | -.025 | .246  |
| Var5             | .862       | .534 | .151  | -.145 |
| Var3             | .858       | .457 | .106  | .173  |
| Var19            | .839       | .234 | .317  | .228  |
| Var4             | .838       | .473 | .198  | .154  |
| Var16            | .822       | .547 | .508  | .072  |
| Var17            | .820       | .593 | .354  | -.071 |
| Var12            | .786       | .683 | .062  | -.056 |
| Var27            | .732       | .084 | .269  | .381  |
| Var28            | .723       | .068 | .308  | .387  |
| Var7             | .685       | .551 | .191  | .175  |
| Var18            | .649       | .022 | .577  | .215  |
| Var13            | .636       | .347 | .060  | .504  |
| Var14            | .545       | .545 | -.179 | .498  |
| Var6             | .533       | .823 | -.065 | .147  |
| Var21            | .197       | .778 | .140  | .145  |

|                                                    |      |      |      |       |
|----------------------------------------------------|------|------|------|-------|
| Var8                                               | .575 | .726 | .107 | .232  |
| Var15                                              | .523 | .676 | .196 | -.177 |
| Var22                                              | .378 | .115 | .759 | .093  |
| Var20                                              | .232 | .186 | .744 | .158  |
| Var25                                              | .197 | .169 | .267 | .711  |
| Extraction Method: Principal Component Analysis.   |      |      |      |       |
| Rotation Method: Promax with Kaiser Normalization. |      |      |      |       |

**Labelling and interpretation of factors**

Labelling is done and symptoms are grouped under subdomains.

| <b>Structure matrix</b>                      |                   |          |          |          |
|----------------------------------------------|-------------------|----------|----------|----------|
|                                              | <b>Components</b> |          |          |          |
|                                              | <b>1</b>          | <b>2</b> | <b>3</b> | <b>4</b> |
| <b><i>Tamaka swasa pradhana lakshana</i></b> |                   |          |          |          |
| Var26                                        | .949              | .515     | .305     | .106     |
| Var2                                         | .944              | .574     | .279     | .084     |
| Var1                                         | .935              | .518     | .280     | .073     |
| Var11                                        | .935              | .534     | .117     | .174     |
| Var9                                         | .882              | .562     | -.025    | .246     |
| Var5                                         | .862              | .534     | .151     | -.145    |
| Var3                                         | .858              | .457     | .106     | .173     |
| Var19                                        | .839              | .234     | .317     | .228     |
| Var4                                         | .838              | .473     | .198     | .154     |
| Var16                                        | .822              | .547     | .508     | .072     |
| Var17                                        | .820              | .593     | .354     | -.071    |
| Var12                                        | .786              | .683     | .062     | -.056    |
| Var27                                        | .732              | .084     | .269     | .381     |
| Var28                                        | .723              | .068     | .308     | .387     |
| Var7                                         | .685              | .551     | .191     | .175     |
| Var18                                        | .649              | .022     | .577     | .215     |
| Var13                                        | .636              | .347     | .060     | .504     |
| Var14                                        | .545              | .545     | -.179    | .498     |
| <b><i>Kapha pradhana lakshana</i></b>        |                   |          |          |          |
| Var6                                         | .533              | .823     | -.065    | .147     |
| Var21                                        | .197              | .778     | .140     | .145     |
| Var8                                         | .575              | .726     | .107     | .232     |
| Var15                                        | .523              | .676     | .196     | -.177    |
| <b><i>Nidra</i></b>                          |                   |          |          |          |
| Var22                                        | .378              | .115     | .759     | .093     |
| Var20                                        | .232              | .186     | .744     | .158     |
| <b><i>Styana</i></b>                         |                   |          |          |          |
| Var25                                        | .197              | .169     | .267     | .711     |

**Factor 1: Tamaka swasa symptoms**

The items under factor 1 are increases on cold exposure, dyspnea, cough, increase of *Kapha*, obstruction in breathing pathway, desire for hot things, as if being covered with sputum, condition worsens on having sweet food, as if filled with sputum, weak digestive activity, coating in throat, slowness in action, loss of body strength, idleness, hindrance to voice, chronic nature, increased salivation, turbid sputum, hindrance to speech, palpitation, sneezing. This includes 14 items and the highest factor loading is 0.949 and the lowest is 0.545.

**Factor 2: Kapha pradhana symptoms**

Factor 2 includes expectoration of sputum, great comfort in use of pungent taste, slimy sputum and white sputum. The highest factor loading is 0.823 and the lowest is 0.676.

**Factor 3: Nidra symptoms**

Factor 3 includes 2 items, excessive sleep and feeling of heaviness of body. The highest loading is 0.759 and lowest is 0.744.

**Factor 4: Styana symptom**

Factor 4 include only one item - Sticky sputum. Factor loading for this item is 0.711.

**Discriminant Validity****Mann-Whitney Test****Ranks**

|     | Type  | N   | Mean Rank | Sum of Ranks |
|-----|-------|-----|-----------|--------------|
| Sum | 1     | 63  | 95.00     | 5985.00      |
|     | 2     | 63  | 32.00     | 2016.00      |
|     | Total | 126 |           |              |

**Test Statistics<sup>a</sup>**

|                        | Sum      |
|------------------------|----------|
| Mann-Whitney U         | .000     |
| Wilcoxon W             | 2016.000 |
| Z                      | -9.687   |
| Asymp. Sig. (2-tailed) | .000     |

**Agreement Statistics**

Agreement statistics was done in place of criterion validity. This is because of unavailability of a gold standard external criterion and insignificant sensitivity output on two-by-two table calculation.

Cohen's kappa (k) is done for interrater agreement.

**Symmetric Measures**

|                            | Value | Asymp. Std. Error <sup>a</sup> | Approx. T <sup>b</sup> | Approx. Sig. |
|----------------------------|-------|--------------------------------|------------------------|--------------|
| Measure of agreement Kappa | 1.000 | .000                           | 11.225                 | .000         |
| No. of valid cases         | 126   |                                |                        |              |

Cohen suggested Kappa result 0.81-1.00 as almost perfect agreement

**Descriptives**

|     |                                  | Statistic   | Std. Error |
|-----|----------------------------------|-------------|------------|
| Sum | Mean                             | 41.86       | 2.660      |
|     | 95% Confidence interval for mean | Lower bound | 36.59      |
|     |                                  | Upper bound | 47.12      |
|     | 5% Trimmed mean                  | 41.50       |            |
|     | Median                           | 41.50       |            |
|     | Variance                         | 891.787     |            |
|     | Std. deviation                   | 29.863      |            |
|     | Minimum                          | 4           |            |

|                     |        |      |
|---------------------|--------|------|
| Maximum             | 89     |      |
| Range               | 85     |      |
| Interquartile range | 60     |      |
| Skewness            | .019   | .216 |
| Kurtosis            | -1.725 | .428 |

### Data Reduction

#### Cronbach's alpha

Cronbach's alpha for each item is listed out first. Items with very low Cronbach's alpha were eliminated one item at a time, to identify the items with significantly high alpha.

4 items were reduced after checking Cronbach's alpha.

- 1) *Upadeha* (9) = As if covered with sputum.
- 2) *Manda* (14) = Slowness in action
- 3) *Guru* (22) = Feeling of heaviness of body
- 4) *Styaana* (25) = Sticky sputum

Final items which were retained and deleted

**Table 8: Retained and deleted items**

| S.No | Symptoms               |          |
|------|------------------------|----------|
|      | General                |          |
| 1    | <i>Seeta</i>           | Retained |
| 2    | <i>Swasa</i>           | Retained |
| 3    | <i>Kasa</i>            | Retained |
| 4    | <i>Balaasaadhikyam</i> | Retained |
| 5    | <i>Srotopidhana</i>    | Retained |
| 6    | <i>Sleshmodgiranam</i> | Retained |
| 7    | <i>Ushnakaamata</i>    | Retained |
| 8    | <i>Pichila</i>         | Retained |
| 9    | <i>Upadeha</i>         | Deleted  |
| 10   | <i>Madhura</i>         | Deleted  |
| 11   | <i>Poorana</i>         | Retained |
| 12   | <i>Agnisadana</i>      | Retained |
| 13   | <i>Kanthopalepa</i>    | Retained |
| 14   | <i>Manda</i>           | Deleted  |
| 15   | <i>Sweta</i>           | Retained |
| 16   | <i>Bala</i>            | Retained |
| 17   | <i>Aalasya</i>         | Retained |
| 18   | <i>Swara graha</i>     | Retained |
| 19   | <i>Chirakaritwa</i>    | Retained |
| 20   | <i>Atinidra</i>        | Retained |
| 21   | <i>Katu upasaya</i>    | Retained |
| 22   | <i>Guru</i>            | Deleted  |
| 23   | <i>Praseka</i>         | Deleted  |
| 24   | <i>Aavila</i>          | Deleted  |
| 25   | <i>Styaana</i>         | Deleted  |

|    |                  |          |
|----|------------------|----------|
| 26 | <i>Vakgraha</i>  | Retained |
| 27 | <i>Hridrava</i>  | Retained |
| 28 | <i>Kshavadhu</i> | Retained |

**Final Tool**

| Attributes of <i>Kapha</i> |                        |                                       |                                                        | 0 | 1 | 2 | 3 | 4 | 5 |
|----------------------------|------------------------|---------------------------------------|--------------------------------------------------------|---|---|---|---|---|---|
| 1                          | <i>Seeta</i>           | Increases on cold exposure            | തണുപ്പുള്ളപ്പോൾ അസുഖം വർദ്ധിക്കുക                      |   |   |   |   |   |   |
| 2                          | <i>Swasa</i>           | Dyspnoea                              | ശ്വാസംമുട്ട്                                           |   |   |   |   |   |   |
| 3                          | <i>Kasa</i>            | Cough                                 | ചുമ                                                    |   |   |   |   |   |   |
| 4                          | <i>Balaasaadhikyam</i> | Increase in sputum                    | കഫത്തിന്റെ വർദ്ധനവ്                                    |   |   |   |   |   |   |
| 5                          | <i>Srotopidhana</i>    | Obstruction in breathing pathway      | ശ്വാസമാർഗ്ഗത്തിൽ തടസ്സം                                |   |   |   |   |   |   |
| 6                          | <i>Sleshmodgiranam</i> | Expectoration of sputum               | കഫംതുപ്പുക                                             |   |   |   |   |   |   |
| 7                          | <i>Ushnakaamata</i>    | Desire for hot things                 | ചൂടിനോട് താല്പര്യം                                     |   |   |   |   |   |   |
| 8                          | <i>Pichila</i>         | Slimy sputum                          | വഴുവഴുപ്പുള്ള കഫം                                      |   |   |   |   |   |   |
| 9                          | <i>Poorana</i>         | As if being covered with sputum       | നെഞ്ചിൽ കഫം നിറഞ്ഞിരിക്കുന്ന അവസ്ഥ                     |   |   |   |   |   |   |
| 10                         | <i>Agnisadana</i>      | Weak digestion                        | ദഹനക്കുറവ്                                             |   |   |   |   |   |   |
| 11                         | <i>Kanthopalepa</i>    | Coating of sputum in throat           | തൊണ്ടയിൽ കഫം പോലെ തോന്നുക പറ്റിപ്പിടിച്ച് പോലെ തോന്നുക |   |   |   |   |   |   |
| 12                         | <i>Sweta</i>           | White sputum                          | വെളുത്ത കഫം                                            |   |   |   |   |   |   |
| 13                         | <i>Bala</i>            | Loss of body strength                 | ശരീരത്തിന് ബലക്കുറവ്                                   |   |   |   |   |   |   |
| 14                         | <i>Aalasya</i>         | Idleness                              | അലസത                                                   |   |   |   |   |   |   |
| 15                         | <i>Swara graha</i>     | Hindrance to voice                    | ഒച്ചയടപ്പ്                                             |   |   |   |   |   |   |
| 16                         | <i>Chirakaritwa</i>    | Chronic nature                        | അസുഖം വിട്ടുമാറാത്ത അവസ്ഥ                              |   |   |   |   |   |   |
| 17                         | <i>Atinidra</i>        | Excessive sleep                       | ഉറക്കക്കൂടുതൽ                                          |   |   |   |   |   |   |
| 18                         | <i>Katu upasaya</i>    | Great comfort in use of pungent taste | എരിവ് രസം കഴിക്കുമ്പോൾ ആശ്വാസം തോന്നുക                 |   |   |   |   |   |   |
| 19                         | <i>Vakgraha</i>        | Hindrance to speech                   | സംസാരിക്കാൻ ബുദ്ധിമുട്ട്                               |   |   |   |   |   |   |
| 20                         | <i>Hridrava</i>        | Palpitation                           | ഹൃദയമിടിപ്പ് വർദ്ധിക്കുക                               |   |   |   |   |   |   |
| 21                         | <i>Kshavadhu</i>       | Sneezing                              | തുമ്മൽ                                                 |   |   |   |   |   |   |

(Score 0-35 Mild, 36-70 Moderate, 71-105 Severe)

Factor extraction using Principal Component Analysis showed that the eigen values of all 25 variables were above 0.5, pointing towards inclusion. Criteria for factor extraction and selection of items in the final tool were Kaiser Criteria, where all components with eigenvalues under 1.0 are eliminated. Cumulative per cent of variance extracted-73.265%. This is an acceptable value. Communality values above 0.4 are considered acceptable. Here, all retained items values were above 0.5, which supports their inclusion. The scree plot followed the ideal pattern, confirming appropriate factor retention. Promax rotation was applied for better interpretation, as here items represented clinical symptoms.

After satisfying all methodological standards, the finalized model comprised 21 items, each demonstrating factor loadings greater than 0.5 in the component matrix. A three-factor structure was identified, collectively explaining more than 70% of the total variance. All extracted items showed communalities above 0.4. The internal consistency of reliability by Cronbach's alpha was 0.961.

Mann-Whitney U test was done to check discriminant validity. A statistically significant difference was observed between *Tāmaka Śvāsa* patients and healthy controls, with mean ranks of 95.00 and 32.00, respectively. The Mann-Whitney U

value was 0.000, with a Z score of -9.687 and an asymptotic significance of  $p < 0.001$ .

## CONCLUSION

The present study successfully developed and validated a tool for assessing the status of *Kapha* in patients with *Tamaka Shwasa*. The final tool consists of 21 items structured on a Likert scale scoring pattern (0-5) and is available in Sanskrit, Malayalam, and English languages, making it simple and practical for clinical application by Ayurveda physicians.

The tool demonstrated acceptable psychometric properties, including test-retest reliability, interrater reliability, face validity, content validity, construct validity, discriminant validity, and agreement statistics. The Kaiser-Meyer-Olkin value of 0.878 and significant Bartlett's test confirmed adequate sampling and suitability for factor analysis. All retained items showed communalities above 0.50, and four factors were extracted. Out of the initial 28 items, 21 items were retained after validation procedures.

The scoring system of the tool may help clinicians categorize the severity of *Kapha dushti* and thereby support treatment planning in *Tamaka Swasa*. Patients with lower scores may benefit from lifestyle modifications, moderate scores may require *Shamana Chikitsa*, and higher scores may indicate the need for *Shodhana Chikitsa*. Thus, the tool may serve as a standardized clinical aid for assessment and therapeutic decision-making in Ayurveda practice.

The study highlights the importance of developing objective and standardized assessment methods in Ayurveda clinical research. Further multicentre studies with larger sample sizes and application of the tool in different clinical settings are

recommended to strengthen its wider clinical utility and generalizability.

## REFERENCES

1. Srikantha Murthy KR. *Ashtanga Hridaya*. Vol. I. Reprint ed. Varanasi; Chaukhamba Krishnadas Academy; 2009. p. 5.
2. Sharma RK, Bhagwan Dash. *Caraka Samhita*. Vol. IV. Reprint ed. Varanasi; Chaukhamba Sanskrit Series Office; 2019. p. 121.
3. Srikantha Murthy KR. *Ashtanga Hridaya*. Vol. I. Reprint ed. Varanasi; Chaukhamba Krishnadas Academy; 2009. p. 156.
4. Sharma PV. *Susruta Samhita*. Vol. I. Reprint ed. Varanasi; Chaukhamba Visvabharati; 2016. p. 102.
5. Sharma RK, Bhagwan Dash. *Caraka Samhita*. Vol. I. Reprint ed. Varanasi; Chaukhamba Sanskrit Series Office; 2019. p. 347.
6. Srikantha Murthy KR. *Ashtanga Hridaya*. Vol. II. Reprint ed. Varanasi; Chaukhamba Krishnadas Academy; 2009. p. 36.
7. Sharma RK, Bhagwan Dash. *Caraka Samhita*. Vol. IV. Reprint ed. Varanasi; Chaukhamba Sanskrit Series Office; 2019. p. 131.
8. Sharma PV. *Susruta Samhita*. Vol. III. Reprint ed. Varanasi; Chaukhamba Visvabharati; 2016. p. 515.
9. Plichta SB, Kelvin EA, Munro BH. *Munro's Statistical Methods for Health Care Research*. 6th ed. Philadelphia; Wolters Kluwer Health/Lippincott Williams & Wilkins; 2012. p. 372.
10. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika*. 1951; 16(3): 297-334.
11. Polit DF, Beck CT. *Nursing Research: Principles and Methods*. 7<sup>th</sup> ed. Philadelphia; Lippincott Williams & Wilkins; 2004. p. 351-356

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### \*Address for correspondence

**Dr. Sneha. S**

PhD Scholar,

Department of Roga Nidana and Vikriti Vigyan, ITRA, Jamnagar.

Email: [snehasuresan@gmail.com](mailto:snehasuresan@gmail.com)

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