

Pratyahara Concept Of Yoga And Its Health Benefits: Scale Validation Applying Confirmatory Factor Analysis

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Abstract

Pratyahara techniques are enshrined in the ancient Indian yoga text books. The concept on pranayama health scale (PHS) is developed based on these scriptures. A PHS is conceptualized, designed, developed and described to measure physical and mental health. We used SPSS and AMOS version 25's exploratory and confirmatory factor analyses to develop a valid and reliable PHS. To test the scale, we randomly selected 599 adolescent participants. The developed PHS comprised standardized regression coefficients with 59.05% variance. Overall reliability of the scale was found to be excellent (0.95). The results of three different Fitness categories of indexes comprising Absolute, Incremental and Parsimonious fits were also analysed and found to be acceptable within the limits. The pranayama scale could be beneficial for the general health and wellbeing of adolescent groups.

Key words: Pratyahara; Health; Psychometric properties; Instrumental study.

Introduction

How many scientists or spiritual leaders or teachers can define pratyahara?,- a forgotten limb of eight limbed yoga?. May be, pratyahara yoga is a least known yoga concept. In this direction, swami shivananda (Frawley, D., 2010) terms pratyahara itself is yoga. Swamiji's concept of pratyahara yoga was based on classical yoga text books. More than 5,000 years ago, yoga journey began as an ancient foundations of Indian psychology for holistic health care, Tripathi, K. M., (2011) proposed numerous practical healing techniques such as pratyahara (prati = control or away, aahar = object) or sense control for better health and wellbeing. The concept of

pratyaharawas developed based on control state of mind from surrounding objects of five senses – seeing, touch, hearing, taste and smell leading to pleasant state of consciousness. Patanjali, the ancient Indian sage explained the conceptual aphorism as “*svavishaya asamprayo gehitt asyasvarupeanukarahivaindriyanam pratyaharah.*” (2.54) It may be translated as focussing the mind inwards and not outward objectives. To illustrate the concept of pratyahara, it may be equated to the bees working principle in procuring the nectar by male soldier bees (outside as senses) to queen bee (inside as mind). Brems, C. et al., (2016) enumerates pratyahara as one of the Patanjali’s classical eight limbed yoga. He identifies it as yogic practices that draw awareness inward, away from outer perception to avoid over stimulation and support concentration, meditation and absorption; pratyahara is one of the sensory level what one non- grasps it as at ethical level (Feurstein, G., 2003) and allowing one self to be inward rather than distracted outward. Further, Satyananda classifies pratyahara into four fold – indriya (senses), prana (vital energy), karma (work) and mano (mind) pratyahara. Andelkar, A., et al., (2018) explains pratyahara as dissociation of one’s consciousness (withdrawal) from the sense organs which helps one to retain connected with the external world.

Non practice of pratyahara leads to diseases at body-mind level which are related to ayurveda. The concept on pratyahara relation to diseases were also explained and discussed in many other vedic scriptures such as Taitriyopanishad's, ayurvedalayer theory (Tripathi, K. M., 2011). In Taitriyopanishad, it is defined as travelling from annamayakosha, food layer to other inside layers of the mind. In the latest editorial of SVYASA journal 'yoga sudha, it was pointed out that the panchakosa model of Taitriyopanishad has started attracting top researchers in the world to address the modern life style non communicable diseases. So, we consider pratyahara principles as a preventive yoga method than a curative technique.

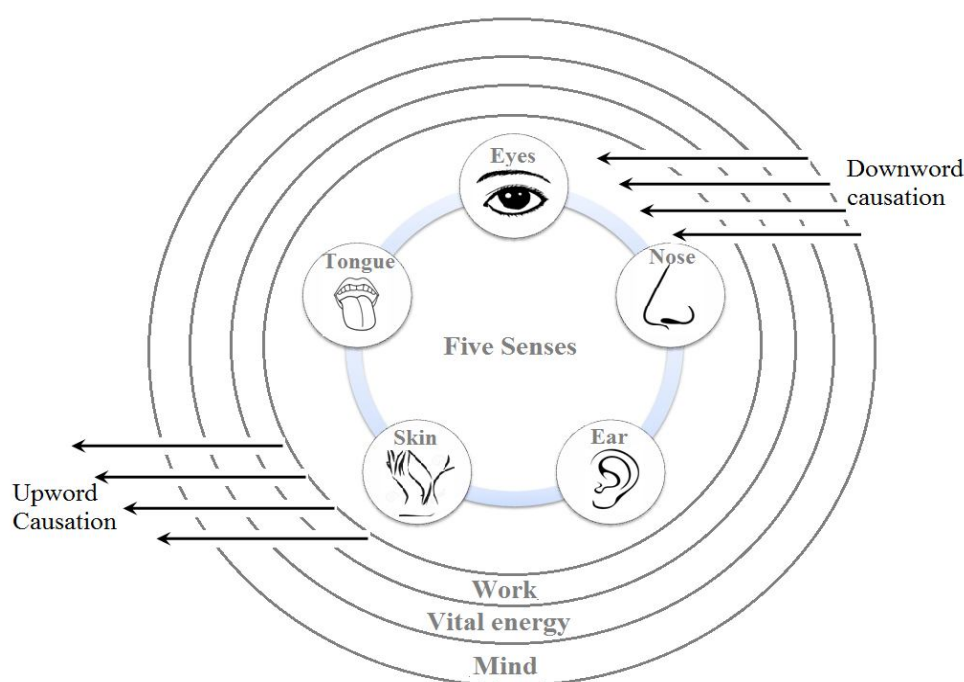


Fig. 1: Pratyahara (sense control) four layer yoga frame of reference

Pratyahara Concept frame of reference

The downward and upward causation of different layers of pratyahara (Fig. 1) gives rise to diseases (vyadhi) and pleasant states (adhi) of body-mind system. Based on Swami Satyananda's (Frawley, D., 2010) classification of pratyahara fourfold theory – indriya (senses), prana (vital

energy), kama (work) and mano (mind) pratyahara, we have designed a frame of reference for different layers. There are 3 levels of food. The first is physical food that brings in the five elements necessary to nourish the body. The second is impressions, which bring in the subtle substance necessary to nourish the mind- the sensations of sound, touch, smell, sight and taste.

Control of senses (Indriya pratyahara):

The innermost layer in the frame of reference is indriya pratyahara (Fig 1). Most of the people suffer from sensory overload, the result of constant bombardment from television, radio, computers, mobiles, newspapers etc. The commercial society functions by stimulating our interest through senses. We are constantly confronted with bright colors, loud noises, and dramatic sensations. We are living in a world of social media, facebook, whatsapp, internet addiction etc.; this is the main form of entertainment in the society. Pratyahara gives its solution in the form of preventive measures.

Control of Prana (Pranapratyahara)

The second layer in figure 1 is vital energy pratyahara. Control of the senses requires vital energy and this is called pranic control. Unless our vital energy substance we will not have power to control senses. If our energies are scattered than the senses will also be scattered and disturbed.

Control of work (Karma pratyahara)

The actions of the sensory organs are controlled by the motor organs. Infact these organs gives direct connection to the external world. The impulses coming to the senses get expressed through motor organs.

Withdrawal of mind (Mano pratyahara)

Minds attention plays important roles in all the sensory perceptions. The minds attention is focussed and we give attention to one activity at a time. We can practice mano-pratyahara consciously by withdrawing our attention from unwanted and negative impressions. This is the highest form of pratyahara practice.

Benefits

Practice of pratyahara techniques has multiple benefits in tackling the modern life style diseases such as diabetes, cancer, Premenstrual syndrome, Schizophrenia, immunity, blood sugar, pain relief etc (1,2,3). The non-communicable diseases (NCD) have posed the highest challenge to modern medical system and have forced to look at higher and subtle dimensions of our creation. Pratyahara model has started attracting the top researches of the world in tackling the concept of classical yoga systems (aadhi) in tackling the NCDs.

Hypothesis

The scale is developed based on the hypothesis given;

H₀:Pratyahara or Sense control may be related to the better health and wellbeing

H₁:Pratyahara or Sense control may not be related to the better health and wellbeing.

Methods

Sampling

DeVellis, R. F., (2016) recommends a ratio of 1:15 or 1:20 as ideal. Learning from the literature, a sample size of greater than 200 was decided to ensure the sample adequacy. The present study

on scale validation was conducted with sample of 830 Indian individuals who were selected based on convenient sampling basis. The study was conducted throughout the Bhopal city, Madhya Pradesh, India. Age of the individuals was considered as the criterion for inclusion and adolescents aged between 10-18 years were included in the study. The individuals who consented to provide data were included in the sample. The data were collected from 5 April to 4 May 2018.

Procedures of scale development

Scale development is a systematic process that is carried out different stages. Following recommendations of DeVellis, R. F.(2016) and Pasquali, L. (2010) scale development for the present study was accomplished in three stages namely item generation, theoretical analysis and psychometric analysis.

Item Generation

Content domain was specified through review of literature related to pratyahara specified in yoga philosophy. Among the eight limbs of yoga, the pratyahara conceptual model (Fig.1) that relates beliefs with health and wellbeing (Birdee, G. S., et al. 2015) was considered to specify the content domain. The model comprises of benefits of pratyahara as the construct for scale development. The present research employed combination of deductive and inductive methods of initial item pool generation as recommended by Kapuscinski, A. N., and Masters, K. S., (2010). The researchers also interacted with experts in the fields of yoga science and obtained qualitative information regarding the content domain and objective of the research. The information was analyzed and related with the concept of pratyahara to generate pool initial items. As a result, 20 items were developed under the selected content domains. Items worded negatively for the

construct were reverse coded and scored. Following the recommendations by DeVellis, R. F., (2016) parameters such simplicity, clarity, specificity, capability to ensure variability of response and freeness from bias of the items were carefully considered while drafting the items.

Theoretical analysis

Content validity

Content validity of the initial items was assessed to make sure that the items are representative of the identified construct i.e. pratyahara. The expert panel comprised of 4 experts; one Vedic philosophy expert from Texas, USA, another expert from alternative and complementary medicine, All India Institute of Medical Sciences, Rishikesh, statistical expert and a psychology professor Sastra university, yoga expert from University of Patanjali, Haridwar, India. The experts assessed the relevance of items in relation to the content domain applying a tool namely Content Validity Index (CVI) developed by Waltz, Stickland and Lenz (2005). The experts rated each item against a four-point scale (1=Not relevant, 2= Somewhat relevant, 3=Quite relevant and 4=Highly relevant).

Face validity

Visual appearance of the tool such as consistency of the style, formatting readability and feasibility as prescribed by Devon et al.,(2007) were tested by applying the initial level scale with 40 individuals. The respondents were asked to judge the user-friendliness of the tool. Feedback from the respondents was incorporated to improve the tool. This process was helpful to assess ambiguity and skewedness i.e. respondents providing very similar answer to all the items.

Psychometric analysis

The psychometric analysis involves a number of quantitative techniques to test construct validity and reliability of the scale. In addition to construct validity, convergent validity, criterion validity and discriminate validity of the scale were tested quantitatively. DeVellis, R. F. (2016) strongly recommends the combined use of Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to achieve consistent results of the psychometric indices. Hence, these validity tests were done using EFA and CFA. Reliability, a quantification method producing the consistent results on recurring examinations (DeVellis, R. F. 2016) was measured in terms of indicators namely Cronbach Alpha, Spearman-Brown coefficient, composite reliability and average variance extraction. Concurrent validity was assessed by calculating the correlation between the scores of the present scale and an established scale namely Yoga Self Efficacy Scale.

Data collection and analysis

In these study the scale was with five options ranging from 'strongly disagree' (score 1) to 'strongly agree' (score 5). Each of the items in the scale is an agreement statement on the five point Likert scale (Likert R., 1932). All the items in the scale were positively stated about pratyahara. The summated score of all the items was treated as the quantifiable measure of the construct and it was considered for all quantitative analytical purposes. All items included in the Likert scale were considered as continuous variables. The scale was prepared in English and Hindi to facilitate respondents' comprehension over the statements. The questionnaire was filled by the respondents. Factors are extracted and a factor structure including the correlation between the factors is proposed by EFA. The proposed factor structure is hypothesized and tested in CFA.

It the statistical results fits with the hypothesized model the researcher can conclude that the factor structure is valid (Babbie, et al., 2018). Hence, the study evaluated the scale using both EFA and CFA. IBM SPSS 25 software version was used to calculate descriptive statistics, correlation matrix, EFA and Cronbach Alpha value. IBM SPSS Amos 25 software version was used to perform CFA. Convergent validity was verified using the Average Variance Extracted, a statistic calculated from values of factor loads. Construct validity was assessed by computing model fitness indices namely p value of Chi square, RMSEA, GFI, AGFI, CFI, TLI, NFI and Chisq/df which were the outputs of confirmatory factor analysis. Discriminate validity was examined by measuring the level of redundancy of items through Modification Indices (MI).

Results

A sample size of 830 healthy participants was selected for the study from the different cross sections of the society to test the psychometric properties of the PHS. They were adolescents (mean age of 14 ± 4 SD) covering equal numbers of both male and female 415-415 (50%)populations. Among the total participants 96.21% practiced pratyahara as a theory and practical subject. The demographic details of the subjects are given in Table 1.

Characteristics	Total (N = 830)		Population			
			Male (N = 415)		Female (N = 415)	
	N	%	N	%	N	%
10-12 years	201	24.82	103	51.24	98	48.76
13-14 years	213	25.14	104	48.82	109	51.17
15-16 Years	204	25.49	103	50.49	101	49.51
17-18 Years	212	24.58	105	49.52	107	50.47

We developed the instrument for pratyahara on the lines of methodology given by Mortero, I., & León, O. G., (2007). As a result based on the conceptual frame work of pratyahara(Fig 1), 20 items were developed under the selected major content domain viz;

pratyahara. As an outcome of this exercise, 20 items such as detachment of unwanted needs, senses are under control, Sensory perception, part of sensory control, courage, keeping in control the need of the body, leads to healthy body-mind and brings wellness were generated as the initial pool of items.

The initial item pool consisting of 20 items was vetted by four experts to assess the degree to which the items taken together constitute an adequate operational definition of a construct (Waltz, C., 2010) i.e. content validity. The experts reviewed the initial item pool using a CVI rating tool. CVI was calculated following the recommendation of Waltz, C., et al. (2010). The experts gave their rating individually. Then, for each item, the index was calculated as the number of experts giving a rating 3 or 4 and this was divided by total number of experts. The items for which the index was less than 0.75 were considered to be irrelevant eliminated from the original list. From the initial pool, 8 items on the draft YSRS were deemed to be invalid because they yielded CVIs of $1/4=0.25$ to $2/4=0.50$ and were removed with CVI lower than 0.75 (Terwee, et al., 2007), All the remaining items were valid with CVIs ranging from 0.75 ($3/4$) to 1 ($4/4$) and were retained which resulted in a 10-item questionnaire. After modifying the scale based on rating by the experts, the scale was individually administered with 40 persons who regularly practiced Yoga. Each statement was read out to the respondent and in reply, the respondent stated what he/she understood from the item. If the content what the respondent comprehended and what had been conceived by the researchers matched, the item would be considered to be qualified. If mismatch was identified, the researcher was asked, "Why did you mean the statement like this?" The response would uncover issues present in the items like vagueness, ambiguity, leading words/sentence, unfamiliar words, complicated sentence, closed ended statement, sensitive statement etc. Based on this information, statements were rephrased.

The modified statements were once again read out to the respondent and feedback was received and accordingly modified. The 10 items developed after content validity testing and cognitive interviews with select respondents.

Exploratory factor analysis (EFA)

The scale evolved after theoretical analysis with 10 items was administered to 830 participants. Exploratory factor analysis was conducted using the scores obtained from the survey. The Kaiser–Meyer–Olkin (KMO) measure was used to assess the sample adequacy and to prove the correlation matrix is an identity matrix Bartlett's Test of Sphericity is calculated. KMO value was 0.97 and it was significant ($p < 0.001$). Bartlett's Test of Sphericity value which tests association between the variables was $\chi^2 = 10867.03$ and it was significant ($p < 0.001$) which were discussed in table 2.

Table 2: KMO and Bartlett's test of sphericity for PHS.

Sl. No.	Scales	Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
			Approx. Chi-Square	df	Significant level
1	Pratyahara	0.97	10867.03	45	0.0001

Principal Component Analysis method of factor extraction was used and one factor was extracted explaining 82.79 % of the total variance. Values of communalities ranged between 0.767 and 0.843. Factor loading measures ranged from 0.88 to 0.92. Since all the factor load values of all the ten variables were greater than 0.5, all of them were retained in the scale for next level confirmatory factor analysis. To undertake the most appropriate interpretation, the loading values were carefully examined using Hair, et al., (2006) guideline for practical

significance, which indicates a factor loading of ± 0.3 for which the item is of minimal significance, ± 0.4 indicates it is more important, and ± 0.5 indicates the factor is significant.

Table 3 shows variance contributed by each factor and their corresponding Eigen values.

Table 3 Exploratory factor analyses of 10-items pratyahara health scale (PHS)		
Sl. No.	Domain/Item	factor loadings
1	Q1: Pratyahara leads to detachment of unwanted needs.	0.88
2	Q2: All my five senses are under control	0.91
3	Q3: Sensory perception is strong	0.91
4	Q4: Fasting is part of sensory control	0.92
5	Q5: Dieting is important for sensory control	0.91
6	Q6: Pratyahara brings courage.	0.88
7	Q7: Pratyahara is balancing the body-mind needs.	0.88
8	Q8: Pratyahara is keeping in control the need of the body.	0.9
9	Q9: Pratyahara practices leads to healthy body-mind.	0.9
10	Q10: Pratyahara practice brings wellness.	0.91
% of variance		82.79
Cumulative %		82.79
<i>Note.</i> Extraction Method: Principal Components. Rotation Method: Varimax. Only factor loadings greater than .40 are reported, in order to aid interpretation of the factor structure. Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.97.		

Confirmatory factor analysis (CFA)

The researchers conducted a CFA applying a structural equation modelling to test a hypothetically developed factor structure with one latent factor and 10 observed variables. The model obtained from confirmatory analysis is presented in Fig 2.

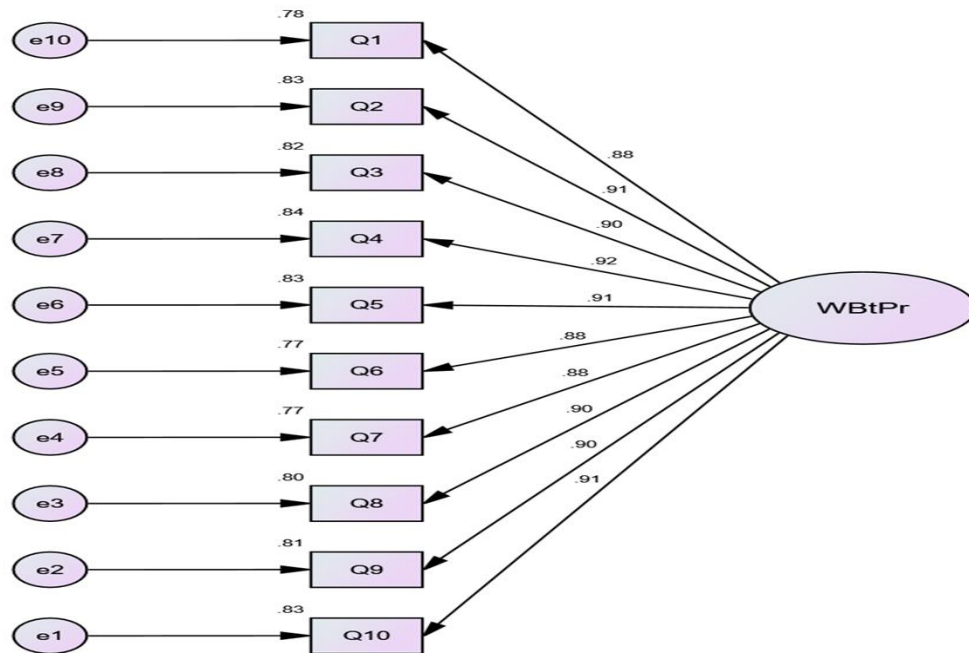


Fig 2. WBtPr model combining all constructs produced by confirmatory factor analysis

The factor loadings for the six items obtained from the confirmatory analysis are given in Table

4. Table 4. Factor loadings of the scale

Item	Standardized Regression (≥ 0.5)
Q1: Pratyahara leads to detachment of unwanted needs.	0.88
Q2: All my five senses are under control	0.91
Q3: Sensory perception is strong	0.9
Q4: Fasting is part of sensory control	0.92
Q5: Dieting is important for sensory control	0.91
Q6: Pratyahara brings courage.	0.88
Q7: Pratyahara is balancing the body-mind needs.	0.88
Q8: Pratyahara is keeping in control the need of the body.	0.9
Q9: Pratyahara practices leads to healthy body-mind.	0.9
Q10: Pratyahara practice brings wellness.	0.91
Regression coefficients	0.899
CR (≥ 0.6)	0.98
AVE (≥ 0.5)	0.81

Convergent validity: We performed three additional factor extractions to confirm the model structure, presented in Table 4. This table shows item quality (Chi-square), composite reliability (CR), and average variance extraction (AVE) were quantified to test convergent validity. Statistical significance of all the items in the model indicates presence of convergent validity. All factors had values of .50 or higher, demonstrating that the observed variable sufficiently reflected its construct's latent variable (Tabachnick, B. G., & Fidell, L. S. 2007). Factors with a CR of .98 were considered good (Raine-Eudy, 2000), and the value of AVE was 0.81 for the scale under consideration (Forenell, C. & Larcker, D. F. 1981).

Construct validity: In confirmatory factor analysis many indices of model fitness are used to test construct validity. Hair J. F., et al. (2010) recommends to use at least one index from model fit categories namely absolute fit, incremental fit and Parsimonious fit. Results obtained in the present study on model fitness indices are presented in Table 5. All three different fit indices minimum level was achieved (Awang, Z. 2012). The statistical fit indices improved immensely when both the one-factor and variables.

Table 5: Model fitness indices computed for the compared with acceptable levels

Sl. no.	Name of category	Name of index	Accepted level	Study result
1	Incremental fit	Comparative Fit Index (CFI)	>0.90	0.99
		Tucker-Lewis Index (TLI)	>0.90	0.99
		Normed Fit Index (NFI)	>0.90	0.99
		Adjusted Goodness of Fit (AGFI)	>0.90	0.96
2	Parsimonious fit	Chi Square/Degrees of Freedom (Chi-square/df)	df<3.0	3.12
3	Absolute fit	Discrepancy Chi Square (Chi-square)	P>0.05	0.0001
		Root Mean Square of Error Approximation (RMSEA)	<0.08	0.05
		Goodness of Fit Index (GFI)	>0.90	0.98

Concurrent validity: A Yoga Self Efficacy Scale (YSES) developed by Birdee, G. S., et al. (2015) with 3 constructs and 12 items was selected to test concurrent validity of the present scale. YSES has been developed to measure self-efficacy among the practitioners of Yoga in American context. The tool has been evolved based on the theory of self-efficacy. YSES has robust internal consistency with Cronbach's alpha value of 0.93 and good construct validity measures. When the scale was administered in our study, it had Cronbach's alpha value of 0.87. The scores of the scale developed in the present study were correlated with YSES. Since the data were not normally distributed, non-parametric tool of association measurement namely Spearman's correlation coefficient was applied. Both the scores were positively correlated ($\rho=0.87$) and it was significant ($p<0.0001$). Presence of criterion validity was proved due to positive and significant correlation coefficient between the newly developed scale and an established scale.

Reliability

Internal consistency of the 10 item scale was determined by calculating Cronbach's alpha measure, Spearman Brown coefficient and composite reliability measure. The Cronbach's alpha value was 0.98 while studies suggest that above 0.7 suggest high levels of internal reliability (DeVon, H. A., et al. 2007). Spearman-Brown coefficient of split half reliability was 0.983. Composite reliability measure was 0.98.

We also performed analyzing internal consistency reliability through inter-item correlations matrix (table 6). It is a measure of if individual questions on a test or questionnaire give consistent, appropriate results. The ideal range of average inter-item correlation is 0.765 to 0.826 and the items are so close as to be almost repetitive. All individual questions had values of

.50 or higher, demonstrating that the observed variable questionnaire give consistent, appropriate results(Kline, P., 2015).

Table 6: Inter-Item Correlation Matrix										
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q1	1									
Q2	0.802	1								
Q3	0.787	0.826	1							
Q4	0.792	0.83	0.819	1						
Q5	0.793	0.833	0.827	0.843	1					
Q6	0.746	0.795	0.787	0.812	0.809	1				
Q7	0.847	0.793	0.79	0.794	0.801	0.765	1			
Q8	0.792	0.854	0.816	0.825	0.811	0.786	0.796	1		
Q9	0.798	0.824	0.844	0.826	0.824	0.795	0.784	0.781	1	
Q10	0.816	0.824	0.82	0.867	0.822	0.805	0.787	0.794	0.81	1
Condition number = 75.391										
Eigenvalues										
8.279 .305 .239 .229 .211 .175 .165 .150 .137 .110										

Test-retest reliability: was assessed over a month's time in 300 participants. The Intra-class correlation coefficient (ICC), Cronbach's alpha and one-sample statistics was used to calculate the test-retest reliability. Average measures ICC for entire scale was 0.98 considered an adequate reliability score (McCoach, et al., 2013). The Overall scale reliability for the items was better, with Cronbach's alpha 0.98. These results confirmed that 12 items pratyahara scale has good stability. Test-retest analysis data mean 3.16 with t-value 44.89 were same over a month's time showed the consistency in a testing procedure.

Discussion

Systematic steps as prescribed in the literature of psychometric research were adopted to develop this instrument. The pratyahara scale concept developed based on ancient Indian yoga philosophical texts as an extensive literature review (deductive method) and consulted with

relevant people about the subject (inductive method) (HoonSong J., et al. 2011). The initial item pool, which had 20 items got reduced to 10 items with five constructs at the end of the study. It has been validated and found to be reliable by using the psychometric analysis. The stated hypothesis that pratyahara may be related to health and wellbeing has been proved with final regression coefficient value (Table 4). It was calculated using EFA and CFA statistical analytical techniques on the lines of Berry, et al., (2011) to assess the influence of pratyahara on health and well being. In terms of scale's validity, reliability and factor structure of pratyahara Scale. The results of this study suggest that the pratyahara Scale is providing an appropriate instrument for measuring the wellness among adolescents and support the factor structure, reliability, and validity of the measures. We identified one factor of the pratyahara Scale as WBtPr exhibited good internal reliability and constituted a model with a good fit (GoF) with the data. The research community, over the years, has developed a number of GoF Indices to test the construct validity. The GoF Indices are categorized into three groups namely absolute fit indices, incremental fit indices and parsimonious fit indices. Absolute fit indices are a quantity of degree of fitness of the model to the empirical data. They offer the most fundamental measure of the fitness (Hair, J. F., et al. 2010). Goodness of Fit Index (GFI) is another absolute fit index. According to Tanaka, J. S., & Huba, G. J. (1989) GFI is equivalent to R^2 in regression analysis. In the lines of R^2 measure, for GFI also Adjusted index is calculated (AGFI). Root Mean Square Error of Approximation (RMSEA) is a population based index and is less sensitive to sample size. Tucker Lewis Index (TLI) has values range between 0 and 1. Models with values close to 1 show better fit. Likewise, Normed Fit Index (NFI) values range from 0 to 1 and values above 0.90 indicate better fit (Song, H. J., et al. 2011). According to Hair, J. F., et al. (2010) a parsimonious model is significant to prove that the postulated model fits the data in comparison

with a complex model. According to Wheaton et al. (Wheaton B. et al. 1977) the ratio of Normed Chi square/df is reasonable. The ratio obtained in the present study was 3.67 and hence it could be inferred that the value is reasonable to judge that the model has parsimonious fitness. The results of this study suggest that the pratyahara Scale is providing an appropriate instrument for measuring the wellness among adolescents and support the factor structure, reliability, and validity of the measures. The 10-item pratyahara Scale is a short scale that can be administered both for general population and for school setting. The age appropriateness is compared with the adolescent psychiatry of the quality of life (Ravens, et al., (2014). The psychometric quality of the pratyahara Scale are generally comparable to the pattern matrix, goodness of fit and factor loadings of the CFA analysis carried out by Huang, C. H., et al (2017). Van den Berg P. T., & Pitariu, H. (2005) has brought out a relationship between wellbeing and personality during societal change. The score of the new scale positively and significantly correlated with the standardized scale namely Yoga Self-Efficacy Scale to prove existence of concurrent validity.

Conclusion

Results of the present study have founded a base and opened up new avenues for further research to develop a more comprehensive scale using additional psychometric testing. Further validation of the new scale needs to be done through longitudinal studies to assess the causal associations between the factors of the new scale. The present study has been undertaken in a cross sectional setting with limited number of samples. Further studies in different contexts with large number of samples will be required to further validate the scale.

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Conflict of interest

Authors and co-author, declare that they have no conflict of interest.

Author Contribution

The main author is the administrative head and the remaining co-author contributed to the data analysis and its statistical interpretation.

Compliance with Ethical Standards

Disclosure of potential conflict of interest: Authors and co-author declare that they have no conflict of interest to this work.

Research involving human participants and/or animals: This article does not contain any studies with animals.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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