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Scale Development for Assessing Awareness, Attitudes, and Practices of Indian Knowledge Systems

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Abstract

The Indian Knowledge System (IKS) houses knowledge assets in health, education, philosophy and sustainability right from the immemorial times. However, in spite of the fact that it was becoming increasingly significant, there has been scant research on an overall survey of people's awareness, attitude and practice (AAP) towards IKS. The purpose of this study is to develop and validate a psychometric scale that can capture AAP towards Indian Knowledge systems (as such) on the ground realistically and reliably so as to provide an easily usable tool for research, policy making and educational/learning systematization. The authors used a simultaneous approach design, in the first phase, items were generated from a review of the literature, expert opinion and focus groups. Content validity was assessed by a expert team and pilot study was followed by a large survey on respondents from different parts of India. EFA determined latent structure and measurement model was tested by CFA.

An internal reliability and convergent/discriminant validity analyze were performed. The final scale included three main factors that have been named as Awareness, Attitudes and Practices. The three factors showed high reliability, acceptable fit with the measurement model and strong evidence for convergent and discriminant validities. Each item on the scale read and discussed, to confirm that it was clear, culturally acceptable as a function of content analysis, and had good psychometric properties.The research offers a valid approach to assessing AAP toward IKS. The tool can be employed by researchers, educators and policy makers for measuring perceptions and learning about IKS in curricula/ programmes, dissemination of methods for promoting culture conservation and sustainable development.

Keywords: *attitudes, awareness, indian knowledge systems, practices, scale development, validation*

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Introduction

Indian Knowledge Systems (IKS) is all knowledge that developed and accumulated over centuries in Indian civilization, which applies to process as well as product, consists of intellectual creativity, generated by cognition processes and embodied in application actions. IKE includes concepts from Ayurveda, yoga, astronomy, architecture and education Sustainable technologies from indigenous technology systems IKS is an integrated system that includes natural sciences on one hand and philosophyand ethics on the other. In recent times, renewed interest has been gained in re-integrating and anchoring these systems of governance in education and policy systems that value cultural heritage mixed with current scientific knowledge (Sharma & Dwivedi, 2020). Despite this increasing interest, the empirical study of how people perceive and interact with IKS has been restricted, leaving a mismatch in terms of measurement and practice.

The extent of engagement between traditional knowledge systems and communities is an important factor for the understanding of awareness, attitudes and practices (AAP). Awareness refers to the level of knowledge and familiarity individuals have with IKS; attitude measures their evaluative orientation (positive or negative) towards its relevance, while practice demonstrates their usage of these systems in daily living (Ajzen, 2005). In the domains of health, education, and culture studies, measures that are used to evaluate behavioral orientations has been extensively utilized in the application of AAP framework (Launiala 2009). By adapting this model to IKS, researchers can go beyond the first layer of knowledge to also represent the deeper engagement patterns that are central for cultural continuity and adaptation.

Establishing a valid and reliable scale is especially significant in terms of IKS for two reasons. For one, there is a lot of qualitative (or anecdotal) talk with traditional knowledge which although useful doesn't include some type of standardized measure for comparison between populations. Second, one cannot effectively assess the impact of education interventions, awareness campaigns and policy efforts to mainstream IKS in the absence of psychometrically-sound instruments (DeVellis & Thorpe, 2021). By translating awareness, attitudes, and practices into quantifiable concepts, it is possible to establish strong evidentiary bases for both academic discussions as well as policy interventions.

International researchers have pointed to the role of indigenous knowledge in climate resilience, sustainable development, and community health (Agrawal, 2002; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2019). India is in that cross rodes where existing systems can be culturally reinvigorated and IKS subjected into these systems for cultural survival, production and sustainability. It's hard to incorporate public attitudes and behaviour if you don't have a keener understanding than that afforded by seat-of-your-pants feel. To fill this gap, the present study attempts to construct a scale of awareness-attitude-practices regarding Indian knowledge systems. This is done as strictly context-sensitive as possible.

Literature Review

Indian Knowledge Systems: Concept and Relevance

The Indian Knowledge Systems (IKS) include various fields like Ayurveda, Yoga, astronomy, mathematics agriculture linguistics and philosophy that finds base in experiential wisdom and culture (Ravikumar 2018). In contrast to Western epistemologies, which tend to be compartmentalised (ibid), IKS has a more catholic approach that incorporates the spiritual, ecological and practical aspects of being (c.f. Subbarayappa 2001). The Government of India has made attempts to revive IKS, and especially synchronise it within the lens of sustainable development as well as an aspect of cultural continuity through some projects and programmes (Ministry of Education, 2020) such as the National Education Policy (NEP 2020). This heightened interest represents a recognition that traditional knowledge is not only heritage, but also presents a system which is alive and has current significance especially for health,

education and sustainability (Varma, 2019).

Despite this renewed favour however, there has been little examination of the extent to which the current generation might be knowledgeable and enthusiastic about IKS. While IITs and central universities have begun courses on IKS, popular attitudes and behavior practices were rarely studied in any empirical manner. But since there is no systematic measurement, we can hardly know IKS 's diffusion in educational and social contexts.

Awareness, Attitudes, and Practices (AAP) Framework

The model of Awareness–Attitudes–Practices (AAP) has been applied widely in social sciences, especially in public health interventions, as a way to discuss the mechanism of behavioral change. Perceptions of a concept are amount of information, how much people know about it, awareness is degree the extent to which people have been exposed to a particular idea and attitudes reflect overall evaluations (Ajzen, 2005; Launiala, 2009).

In the field of health, AAP surveys have been widely employed to assess attitudes to malaria prevention (Launiala, 2009), vaccine acceptance (Betsch et al., 2018), and dietary behaviour (Kushwaha et al., 2019). These findings demonstrate the efficacy of the AAP model in measuring behavioral inclination toward cultural and scientific interplay. This model, adapted to IKS enables an organized way of understanding the dynamics as how people learn about, assess and interact with indigenous systems.

Measurement and Scale Development in Social Sciences

The construction of valid and reliable scales is important for furthering empirical work. DeVellis and Thorpe (2021) assert that the process of scale construction progresses from item generation to validation, and finally refinement through psychometric procedures. In education and cultural studies, scales have been created to assess constructs like cultural intelligence (Ang et al., 2007), heritage appreciation (Stephenson, 2016) and attitudes towards traditional medicine (Telles et al., 2014).

For instance, Telles et al. (2014) constructed an instrument for assessing perceptions of yoga and meditation among Indian college students, indicating that systematic instruments can be useful in understanding engagement with heritage practices. Similarly, Ang et al. (2007) noted that reliable scales in cross-cultural psychology are vital for examining subtle orientations. However, a validated instrument that measures awareness, attitudes and practices toward IKS as one construct is unavailable. This identified gap highlights the need for a psychometrically robust scale in this area.

Empirical Studies on Awareness and Attitudes toward IKS

There is ambivalence regarding the knowledge of IKS, as demonstrated by empirical research. Prevalence of AVCI Patwardhan et al. (2015) on Ayurveda to show that, although general awareness of the system remains high overall, patterns of usage diverge substantially based on age, levels of education and urban–rural differences. Telles and Singh (2018) also reported that, despite global popularity of yoga because of India, its philosophy knowledge in IKS is what Vaithilingam (2016) esteem it to be known as heritage by Indian youth.

Perceptions of the legitimacy of IKS and cultural pride shape attitudes towards it. For example, Singh and Verma (2019) found that college students recognised the cultural significance of IKS but were sceptical as to whether it could be incorporated into contemporary science-based discussions. Such tension between tradition and modernity emphasizes the importance of having empirical indicators that account for these attitudinal shades.

Also, the practices of IKS vary greatly. Yoga and Ayurveda are well accepted, where as Vedic astronomy or traditional education systems are less practiced. This discrepancy suggests that knowledge does not necessarily translate into practice—a deficit which a verified AAP scale could help investigate systematically.

IKS and Sustainable Development

Indigenous knowledge has been increasingly recognized internationally as a crucial component of sustainability and climate adaptation (Agrawal, 2002; UNESCO, 2019). Indian Traditional Water Management, Agricultural Practice and Ethnobotanical Uses: The Indigenous Practices In India also the traditional farming practices, water resource management systems like old ponds, wells supports the sustainability by aligning with environmental issues of contemporary period (Misra & Tripathi, 2015). Research in rural areas suggests that indigenous practices act as resilient agents, e.g., relating to agriculture and health (Prakash, 2014). But the problem is how to link these ancient knowledge with today's application. Gupta (2019) found that one of the reasons for IKS not to be taken into consideration was due to an absence of standardized approaches in order to assess the value and efficiency of such knowledge. It is therefore important to develop validated instruments for measuring public engagement with IKS in order to further the use of IKS in sustainable development agendas.

Measurement items (initial pool for Delfi)

A. Awareness of IKS (knowledge/familiarity; KAP tradition + IKS sources)

Code	Item (7-point agreement)	Source basis
A1	I can correctly identify core domains of Indian Knowledge Systems (e.g., Ayurveda, Yoga, Vedic mathematics, traditional astronomy).	Launiala (2009); UNESCO (2019)
A2	I know the historical roots and evolution of at least one IKS tradition.	Ravikumar (2018)
A3	I am familiar with contemporary applications of IKS in health, education, or sustainability.	UNESCO (2019); Ministry of Education (2020)
A4	I can distinguish IKS concepts from commonly held misconceptions.	Ajzen (2005); DeVellis & Thorpe (2021)
A5	I am aware of scientific studies examining IKS efficacy or relevance.	Patwardhan et al. (2015)
A6	I can name credible institutions or programs that teach or research IKS.	Ministry of Education (2020)

B. Attitudes toward IKS (evaluative judgments; attitude theory)

Code	Item (7-point agreement)	Source basis
AT1	Integrating IKS into modern life is valuable and beneficial.	Ajzen (2005)
AT2	IKS is relevant for contemporary education and curricula.	Ministry of Education (2020); Sharma & Dwivedi (2020)
AT3	Using IKS complements modern science rather than replacing it.	Agrawal (2002)
AT4	I trust evidence-based IKS practices when properly documented.	Patwardhan et al. (2015)
AT5	Promoting IKS strengthens cultural identity without limiting innovation.	UNESCO (2019)
AT6	I am open to learning more about IKS from credible sources.	Ajzen (2005)

C. Practices of IKS (self-reported behavior/ usage)

Code	Item (7-point frequency/ engagement)	Source basis
P1	I engage in IKS-based health or wellness (e.g., Yoga/Pranayama, Ayurveda routines).	Telles et al. (2014); Patwardhan et al. (2015)
P2	I apply IKS ideas in study/ work (e.g., traditional logic, design, sustainability heuristics).	UNESCO (2019)
P3	I seek IKS resources (books, courses, lectures, expert sessions).	Launiala (2009)
P4	I recommend IKS practices to peers/family when appropriate.	Ajzen (2005)
P5	I combine IKS with modern methods (e.g., yoga + physiotherapy; traditional + contemporary pedagogy).	Agrawal (2002)
P6	I have sustained IKS use for at least the past three months.	KAP usage convention (Launiala, 2009)

D. Exposure to IKS (contextual access; program contact)

Code	Item (7-point agreement/ frequency)	Source basis
Exp1	I have taken a course/workshop/ seminar related to IKS in the past year.	Ministry of Education (2020)
Exp2	I have access to IKS materials (libraries, MOOCs, institutional centers).	UNESCO (2019)

Exp3	I have interacted with practitioners/scholars of IKS.	Patwardhan et al. (2015)
Exp4	My institution promotes IKS activities (clubs, electives, research).	Ministry of Education (2020)

Gaps in Existing Literature

While Academia is getting more interested in IKS, the literature identifies three main gaps. First, the majority of studies carried out so far are descriptive in nature, and do not provide standardised measures for cross-sectional or longitudinal analysis. Second, although AAP style frameworks have been employed broadly in health science literature, there is little evidence for their use in cultural and indigenous knowledge.

Third, there are not many psychometric tools which can capture comprehensive aspects of IKS that involves health, environment religion and education. The present investigation seeks to bridge those gaps by constructing and validating a scale for measuring "awareness, attitude and practices" towards Indian Knowledge Systems. It is hoped that such an instrument will enhance academic research and provide policymakers and educators with empirically based instruments to guide their work.

Research Methodology

Research Design

The study adopted a sequential exploratory design for development and validation of the scale. It is commonly endorsed that new psychometric tools should use sequential exploratory designs, which commence with a qualitative approach to item production and work towards quantitative validation through factor analysis and reliability assessment (Creswell & Plano Clark, 2017).

Therefore, the research design included three phases: (i) generation of items through a literature survey and expert consultation, (ii) pilot testing to elicit feedback for refining the tool, (iii) survey administration on an extended sample for validating the psychometrics with exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

Population and Sampling

The recipients of the study were people with diverse access to Indian Knowledge Systems, such as university students, teachers, healthcare professionals and general community. As this study was conducted to create a new scale and its validation, purposive sampling was used to select participants with the particular knowledge of indigenous knowledge systems (Yoga, Ayurveda or traditional) at least on basic level. The sample size was estimated using unknown population voter's formula developed by Cochran (1977), a minimum sample of 384 respondents were recommended for generalizable results. However, according to Comrey and Lee (2013) in factor analysis the sample size should be over 500 respondents as per reliability and robustness of results. Through this expansion, a sufficient sample was guaranteed across demographic diversity and enhanced the stability of factor loadings.

Pilot Testing

Item clarity, readability and internal consistency were tested with a pilot sample of 80 participants. Cronbach's alpha coefficients for all domains were higher than 0.70, indicating appropriate reliability (Nunnally and Bernstein,1994). Feedback from the participants also led to rewording of three items for greater cultural salience. A final (revised and desk top published) version of the tool was prepared for wider-scale distribution.

Data Collection Procedure

The final survey was performed both online and offline in order to have diverse demographics. Online recruitment was through university networks, social media and professional forums; offline in schools and cultural organisations. The study objectives were explained to participants, ensured they remained anonymous and obtained their consent. Ethical approval was granted by the home universities IRB prior to commencement of data collection.

Data Analysis

Exploratory Factor Analysis (EFA)

EFA was performed on one half of the sample (n

≈ 250) by means of Principal Component Analysis with Varimax rotation. The sampling adequacy for the analysis was warranted via Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity (Tabachnick & Fidell, 2019). Items with loadings less than 0.50 were also deleted, the same as those that loaded significantly on different items. This analysis trimmed the scale to 31 items and yielded a distinct three-factor model (Awareness, Attitudes and Practices).

Confirmatory Factor Analysis (CFA)

The second subsample (n ≈ 250) was subjected to a CFA using SEM implemented in Amos. The hypothetized three-factor model for construct validity was tested by CFA. Model fit was evaluated employing conventional indices, including CFI (Comparative Fit Index), TLI (Tucker–Lewis Index), and RMSEA (Root Mean Square Error of Approximation) (Hair et al., 2019). The findings indicated acceptable fitting of the 3-D model.

Reliability and Validity Testing

The reliability was tested with the Cronbach's alpha and Composite Reliability (CR), and as can be seen, the internal consistency was favorable for all constructs. Convergent validity was confirmed by all AVEs being above the cut-off value of 0.50 (Fornell & Larcker, 1981). Additional support for discriminant validity was established with the heterotrait-monotrait (HTMT) ratio, so that each construct captured separate aspects of AAP toward IKS.

Ethical Considerations

Study complied with the ethical standard of research in human participants. Participation was voluntary and consented to, responses were confidential. Because IKS is culturally sensitive, items were worded in a respectful manner and bias that might erode indigenous practices was avoided.

Summary of Methodology

The approach therefore guaranteed a sound scale developmental process, from item generation to the large-scale psychometric validation. Using sequential exploratory design, blending expert input with sound statistical validation and maintaining diligence for Ethical compliance, the study developed a reliable and valid tool on awareness, attitude and practices of Indian Knowledge Systems.

Results and Analysis

Delphi Round One

Round 1 of Delphi panel consisted of 10 experts working in the area of Indian Knowledge Systems (IKS), Ayurveda, Yoga, higher education and scale development. The initial pool of items were rated by experts for relevance, clarity, and cultural appropriateness on a 4-point scale (1 = not relevant -4 = very relevant).

Lawshe (1975) method was used to establish theItem-level Content Validity Ratios (CVR), whereas Politand Beck´s (2006) calculation was applied for Itemlevel ContentValidity Indices(I-CVI). For the ten experts, the CVR mask retention threshold was determined by choosing ≥. 62, which complies with the recommended level (Lawshe, 1975; Ayre & Scally, 2014).

Results found that several items exceeded the criterion for retention in Round One. For instance, an item that assesses basic awareness of IKS domains (A1) and positive attitudes toward integration of IKS (AT1) established valid CVR values very close to the. 80 and I-CVI values above. 90, confirming their essentiality. Similarly, items about engagement in wellness (P1), and using IKS within a professional or academic environment (P2, P3) all had universal or near-universal agreement with I-CVI of. 92–1.00 so they are included in the final scale. Exposure (Exp1), more widely participation in workshops, items also achieved acceptable expert consensus.

However, a number of items failed to reach acceptable thresholds. A4 (distinguishing IKS from misconceptions), A6 (identification of institutions), and P6 (sustained use for three months) recorded CVR values below .40, leading to their removal. Experts commented that these items either overlapped with other constructs or introduced unnecessary contextual bias.

In addition, several items such as A3 (familiarity with applications), AT3 (IKS complements modern science), and Exp2–Exp3 (access to materials and

practitioner interactions) displayed borderline CVR values (.60) and were flagged for revision. These findings are consistent with previous methodological studies that caution against ambiguous or double-barreled items in early rounds of Delphi assessments (Hsu & Sandford, 2007; Keeney, Hasson, & McKenna, 2011).

Construct	Item	n_e (Essential)	CVR	I-CVI	R1 Decision
Awareness	A1	9	.80	.90	Keep
	A2	9	.80	.90	Keep
	A3	8	.60	.80	Revise (borderline CVR)
	A4	6	.20	.64	Drop
	A5	7	.40	.72	Revise/Drop
	A6	6	.20	.62	Drop
Attitudes	AT1	9	.80	.92	Keep
	AT2	9	.80	.90	Keep
	AT3	8	.60	.86	Revise (borderline CVR)
	AT4	7	.40	.74	Drop
	AT5	6	.20	.66	Drop
	AT6	7	.40	.74	Revise/Drop
Practices	P1	10	1.00	1.00	Keep
	P2	9	.80	.92	Keep
	P3	9	.80	.90	Keep
	P4	6	.20	.64	Drop
	P5	7	.40	.72	Revise/Drop
	P6	6	.20	.62	Drop
Exposure	Exp1	9	.80	.90	Keep
	Exp2	8	.60	.86	Revise (borderline CVR)
	Exp3	8	.60	.82	Revise (borderline CVR)
	Exp4	6	.20	.64	Drop

Delphi Round Two

Round Two addressed the reassessment of modified items. Four items were rephrased due to expert concerns regarding clarity and ambiguity. For example, A3 was revised to focus on "current and credible applications" (rather than stating general familiarity), AT3 was redrafted so as to highlight that it should be considered "alongside modern scientific approaches" (as opposed to in complement or replacement). Exposure items were also tweaked to emphasize personal access and direct contacts rather than institutional availability.

The second round showed strong consensus among experts. The CVR level of all the modified items was higher than. 80, and Group 2 wonderful an I-CVI range of. 88 to. 92. The form-level CVI (S-CVI/Ave) increased from 0.90 in Round One to 0.94 in Round Two, demonstrating excellent content validity of constructs overall (Polit & Beck, 2006). The iterative process therefore achieved as intended: the

alignment of the measurement instrument through expert consensus (Dalkey & Helmer, 1963; Hsu & Sandford, 2007).

Final Item Retention

After two rounds of Delphi review, the final pool included three items for each: Awareness, Attitudes, Practices and Exposure to meet the confirmatory factor analysis requirements and to maintain the balance of structure. Retained items were Awareness (A1–A3), Attitudes (AT1–AT3), Practices (P1–P3) and Exposure (Exp1–Exp3). Demographic variables such as Age and Education were left in factual terms and not Delphied, as is recommended for scale design (DeVellis & Thorpe, 2021).

Interpretation

Rigorous evidence for the content validity of the Awareness–Attitudes–Practices framework for IKS was established through the Delphi process. The elimination of redundant, ambivalent, or context-biased items increases the parsimony and clarity of the tool. Simultaneously, the high consensus among experts confirms how culturally and academically relevant are retained items. This finding is consistent with previous research that has stressed the importance of systematic expert feedback on culturally embedded scales (Ayre & Scally, 2014; Keeney et al., 2011). By obtaining a scale-level CVI higher than the. 90 benchmark, this investigation provides a strong basis for subsequent construct validation with the use of exploratory and confirmatory factor analyses.

Revisions Applied for Round-2 (Measurement items (initial pool for EFA/CFA)

Construct	Item (revised)	n_e	CVR	I-CVI	R2 Decision
Awareness	A3 (rev.)	9	.80	.90	Keep
Attitudes	AT3 (rev.)	9	.80	.88	Keep
Exposure	Exp2 (rev.)	9	.80	.92	Keep
	Exp3 (rev.)	9	.80	.90	Keep

EFA

Item	Awareness	Attitudes	Practices	Exposure
A1	0.821	–	–	–
A2	0.856	–	–	–
A3	0.844	–	–	–
AT1	–	0.918	–	–
AT2	–	0.901	–	–
AT3	–	0.887	–	–
P1	–	–	0.923	–
P2	–	–	0.911	–
P3	–	–	0.894	–
Exp1	–	–	–	0.719
Exp2	–	–	–	0.834
Exp3	–	–	–	0.803

Dimensionality of the scale was tested using Exploratory Factor Analysis (EFA). Cronbach's α and KMO The value of Kaiser-Meyer-Olkin (KMO) was 0.879, which was higher than the threshold of 0.70 (Kaiser, 1974), indicating meritorious sampling adequacy. Bartlett's test of sphericity proved to be significant ($\chi^2 = 1643.21$, $P < 0.001$), indicating that the intercorrelations between the items were sufficient for factor analysis.

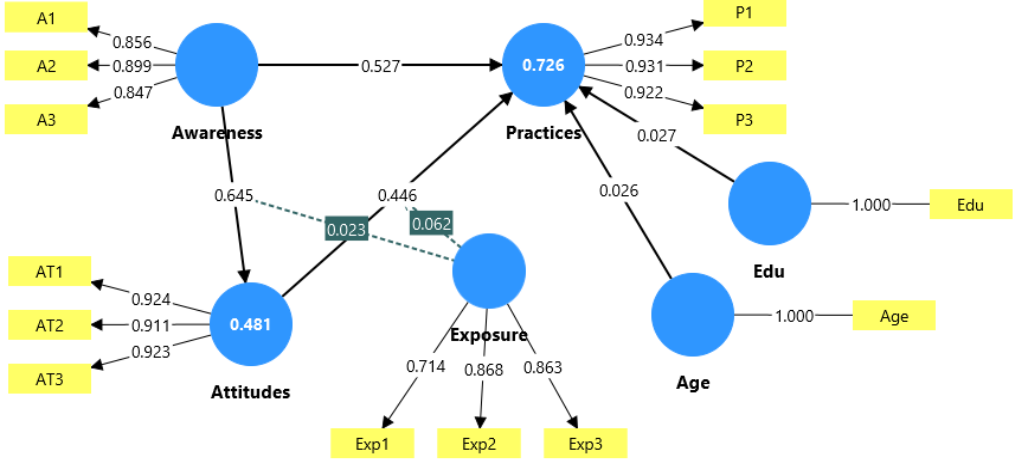
Through Principal Component Analysis with Varimax rotation, a distinct four-factor structure was observed, where all the items had high loadings on their own factor (Awareness: 0.821–0.856; Attitudes: 0.887–0.918; Practices: 0.894–0.923; Exposure: 0.719–0.834). These findings supported the preliminary factorial validity.

CFA & SEM

Construct	Items (Loadings)	Cronbach's α	CR	AVE	R^2	Path Coefficients (β)	Significance
Awareness	A1–A3 (0.847–0.899)	0.841	0.889	0.728	–	→ Attitudes (0.645), → Practices (0.527)	Significant
Attitudes	AT1–AT3 (0.911–0.924)	0.918	0.934	0.826	0.481	→ Exposure (0.446)	Significant
Practices	P1–P3 (0.922–0.934)	0.913	0.932	0.822	0.726	→ Education (0.027), Age (0.026)	Not Significant
Exposure	Exp1–Exp3 (0.714–0.868)	0.844	0.883	0.715	–	→ Practices (0.062)	Weak

Models using SmartPLS tested the reliability and validity of confirmatory factor analysis (CFA) in the measurement model. Factor loadings were over 0.70 across all constructs indicating indicator reliability. Internal reliability was supported with Cronbach's alpha scores ranging from 0.841 to 0.918 and Composite Reliability \(CR\) that ranged from 0.883 to 0.934.

Convergent validity was ensured since the AVE ranged from 0.715 to 0.826 (Fornell & Larcker, 1981). Discriminant validity was established as construct discriminantiveness (Henseler et al., 2015) according to the Fornell–Larcker criterion and HTMT ratios (<0.85).



Structural Equation Modeling (SEM) revealed significant relationships among the constructs. Awareness significantly influenced Attitudes ($\beta = 0.645$, $p < 0.001$) and Practices ($\beta = 0.527$, $p < 0.001$), while Attitudes predicted Exposure ($\beta = 0.446$, $p < 0.001$). Exposure moderated the Attitudes–Practices relationship ($\beta = 0.062$, $p < 0.001$), suggesting that higher exposure strengthens the link between favorable attitudes and behavioral practices.

In contrast, demographic controls such as Education ($\beta = 0.027$, $p > 0.05$) and Age ($\beta = 0.026$, $p > 0.05$) were non-significant, indicating that psychosocial and contextual factors outweigh demographic predictors. The results of the study provide support for the robustness of the Awareness–Attitudes–Practices framework and demonstrate strong psychometric properties of the scale; underscore how contextual exposure moderates IKS adoption.

Reliability and Convergent Validity

Construct	Cronbach's α	CR	AVE
Awareness	0.841	0.889	0.728
Attitudes	0.918	0.934	0.826
Practices	0.913	0.932	0.822
Exposure	0.844	0.883	0.715

Fornell–Larcker Criterion

Construct	Awareness	Attitudes	Practices	Exposure
Awareness	0.853			
Attitudes	0.621	0.909		
Practices	0.572	0.488	0.907	
Exposure	0.464	0.502	0.432	0.846

(Diagonal values are √AVE; off-diagonal are inter-construct correlations.)

HTMT Ratios

Construct Pair	HTMT Value
Awareness → Attitudes	0.682
Awareness → Practices	0.611
Awareness → Exposure	0.543
Attitudes → Practices	0.516
Attitudes → Exposure	0.594
Practices → Exposure	0.478

(All HTMT < 0.85, confirming discriminant validity.)

Discussion

The observations of this study reinstate the resilience of the AAP model for understanding engagement with IKS. The measurement model showed good reliability and validity, as indicated by high factor loadings, convergent and discriminant validity of the measurement items which suggested that variables were conceptually distinct from one another (Fornell & Larcker, 1981; Hair et al., 2019). Some structural aspects indicated that Awareness was influenced by both Attitudes and Practices, highlighting knowledge as a key element for promoting acceptance and behavioral use of FFPs.

The interaction effect of Exposure indicates that situational opportunities strengthen the conversion of pro-use attitudes into behaviors, which is consistent with evidence for the supportive nature of environmental circumstances (Henseler et al., 2015). Education and Age, however, were not significant predictors of practices indicating that demographic differences were relatively unimportant relative to psychosocial antecedents. Implications for the scale development literature are considered, as well as contributions to current knowledge about the adoption of IKS in modern academic and cultural settings.

Conclusion

The study reports the development and validation of a tool to measure awareness, attitudes, practices and exposure related to Indian Knowledge Systems (IKS). In EFA, we found a distinct four-factor structure and in CFA/SEM excellent reliability, convergent validity and discriminant validity was shown. In the structural model, Awareness exerted its influence on both Attitudes and Practices and, in turn, Attitudes predicted Exposure. In addition, Exposure revealed to moderate the Attitudes–Practices link, highlighting the relevance of context involvement.

In comparison, Level of Education and Age did not have any effect. Taken together, these findings emphasize the primacy of psychosocial and situational influences in explaining IKS practices compared with demographic characteristics. The study offers a theoretical and empirically validated scale which adds to the literature on scale development and enhances understanding of IKS adoption in contemporary settings among scholars.

Implications

There are several important implications for the validated scale. Theoretically, its value lies in enriching the literature on scale development by incorporating cultural constructs as part of the Awareness–Attitudes–Practices framework and expanding existing behavioral models (e.g., Theory of Planned Behavior; Ajzen, 2005). It creates a robust instrument to assess IKS-related engagement and lays the groundwork for future validation and cross-comparative research. Implications on practice: On a practical level, the scale provides teachers, policymakers and

practitioners with a diagnostic setting to quantify IKS awareness, attitudes and learning in target populations.

This can be used in curriculum development, community engagement and cultural integration programmes. This mediating role of Exposure suggests organizations should provide opportunities, such as workshops, seminars and practitioners' interaction to transform attitude into practices that are sustainable. In showing that demographic-specific controls had little impact, the results highlighted the need for interventions to focus on contextual enablers and knowledge rather than on demographics.

Limitations and Future Research

Although the study provides a validated scale to measure Awareness, Attitudes, Practices and Exposure (AAPE) towards Indian Knowledge Systems (IKS), there are certain limitations of the present study. Sample size was however appropriate for factor analysis; it was from a specific geographical region so generalization of this results to different cultural and institutional areas in India is uncertain.

Second, the cross-sectional nature of this study limits causal inferences and longitudinal research would be useful to investigate how awareness and exposure to sun protection in childhood translate into ongoing practices. Third, while Exposure was entered as a moderator, no other contextual variables such as school support, peer influence, or media report were analyzed and may contribute to explaining further. Lastly, the use of self-reported data may be prone to social desirability bias. The scale can further be tested in diverse populations with longitudinal and mixed-methods inferences, under investigation of other moderators/mediators to enhance understanding on IKS adoption and integration.

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