

Validity Evidence in Knowledge, Attitudes, and Practices (KAP) Studies in Health: Scoping Review

Evidências de Validade em Estudos Conhecimentos, Atitudes e Prática (CAP) em Saúde: Revisão de Escopo
Evidencias de Validez en Estudios de Conocimientos, Actitudes y Prácticas (CAP) en Salud: Revisión de Alcance

RESUMO

Objetivo: Mapear as produções científicas sobre evidências de validade em estudos Conhecimentos, Atitudes e Prática (CAP) em saúde. **Método:** Revisão de escopo seguindo a metodologia do Joanna Briggs Institute com protocolo registrado na *Open Science Framework*. Realizou-se busca em oito fontes informacionais, sem restrição idiomática ou temporal. A síntese e classificação das evidências seguiram as cinco fontes previstas nos *Standards for Educational and Psychological Testing*, empregando-se também o *software* VOSviewer para análise de coocorrência de palavras-chave. **Resultados:** Incluíram-se 110 estudos, a maioria publicada a partir de 2020, predominando instrumentos direcionados a profissionais de saúde, com escalas Likert e validade de conteúdo. Evidências de estrutura interna, processos de resposta e consequências da avaliação foram menos frequentes. Houve dissociação recorrente entre conhecimento, atitude e prática, influenciada por fatores contextuais. **Conclusão:** O avanço metodológico dos CAP exige integração das cinco fontes de evidência psicométrica e sensibilidade cultural.

DESCRIPTORES: Estudos de validação; Conhecimentos, atitudes e prática em saúde; Inquéritos e questionários; Estudos de validação.

ABSTRACT

Objective: To map scientific publications on evidence of validity in Knowledge, Attitudes, and Practice (KAP) studies in health. **Method:** Scope review following the Joanna Briggs Institute methodology with protocol registered in the *Open Science Framework*. A search was conducted in eight information sources, with no language or time restrictions. The synthesis and classification of evidence followed the five sources provided for in the *Standards for Educational and Psychological Testing*, also using *VOSviewer* software to analyze keyword co-occurrence. **Results:** A total of 110 studies were included, most of which were published after 2020, predominantly instruments aimed at health professionals, with Likert scales and content validity. Evidence of internal structure, response processes, and assessment consequences was less frequent. There was recurrent dissociation between knowledge, attitude, and practice, influenced by contextual factors. **Conclusion:** The methodological advancement of CAP requires the integration of the five sources of psychometric evidence and cultural sensitivity.

DESCRIPTORS: Validation studies; Health knowledge, attitudes, and practice; Surveys and questionnaires; Validation studies.

RESUMEN

Objetivo: Mapear las producciones científicas sobre la validez de las pruebas en estudios de conocimientos, actitudes y prácticas (CAP) en salud. **Método:** Revisión de alcance siguiendo la metodología del Joanna Briggs Institute con protocolo registrado en el *Open Science Framework*. Se realizó una búsqueda en ocho fuentes de información, sin restricciones lingüísticas ni temporales. La síntesis y clasificación de las evidencias siguieron las cinco fuentes previstas en los *Estándares para Pruebas Educativas y Psicológicas*, empleando también el *software* VOSviewer para el análisis de la coocurrencia de palabras clave. **Resultados:** Se incluyeron 110 estudios, la mayoría publicados a partir de 2020, predominando los instrumentos dirigidos a profesionales de la salud, con escalas Likert y validez de contenido. Las evidencias de estructura interna, procesos de respuesta y consecuencias de la evaluación fueron menos frecuentes. Hubo una disociación recurrente entre conocimiento, actitud y práctica, influenciada por factores contextuales. **Conclusión:** El avance metodológico de los CAP exige la integración de las cinco fuentes de evidencia psicométrica y la sensibilidad cultural.

DESCRIPTORES: Estudios de validación; Conocimientos, actitudes y prácticas en salud; Encuestas y cuestionarios; Estudios de validación.

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INTRODUCTION

The Knowledge, Attitudes, and Practice (KAP) research technique is a relevant tool in the health field, especially in understanding the behaviors of population groups in relation to health problems and guiding evidence-based interventions. These studies analyze levels of knowledge, attitudes, and practice in an integrated manner, generating data that assist in the formulation of public policies and programs aimed at health promotion ^{1,2}.

The CAP study was initially used in epidemiological research and in strategies for the prevention of Human Immunodeficiency Virus (HIV), especially in the Brazilian context, highlighting the importance of considering the social determinants of health and individual and collective vulnerabilities in the response to the epidemic. From this basis, the technique was incorporated into different contexts and populations, expanding into the field of epidemiology and being adapted to support strategic planning and health promotion interventions in multiple scenarios ^{3,4}.

The use of CAP studies is widely documented in various subfields of health. Studies have explored its application in the educational use of artificial intelligence ⁵, in stroke rehabilitation ⁶, in the control of infectious diseases such as COVID-19 ^{1,7-9}, and in identifying knowledge gaps about cancer prevention ¹⁰. Based on these findings, educational initiatives can be implemented, resulting in greater adherence to good practices and improved health indicators ².

The development of CAP studies requires a rigorous process, which includes defining the specific domains of each dimension and formulating clear and relevant items ¹¹. Content validity evidence, conducted by experts, is essential to ensure that the instrument reflects the proposed objectives. Techniques such as factor analysis and item response theory are often used to ensure validity based on internal structure and reliability ¹².

According to the *Standards for Educational and Psychological Testing* ¹³, evidence of validity must be obtained from multiple sources, including test content, response processes, internal structure, relationships with external variables, and assessment consequences. This perspective reinforces that validity is not an intrinsic property of the instrument, but a judgment constructed based on accumulated evidence.

In this sense, it is pertinent to question the extent to which CAP studies have systematically incorporated these different types of evidence, moving beyond the almost exclusive emphasis on content validity to adopt broader and more robust research strategies. Given this, the objective of this review was to map scientific productions on evidence of validity in CAP studies in health.

METHOD

Protocol and registration

This scoping review was conducted according to the methodological guidelines of the Joanna Briggs Institute (JBI) and its report was structured according to the items in the *Pre-*

ferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist. The protocol that guided the research was previously registered on the *Open Science Framework (OSF)* platform, under the identifier: <https://osf.io/gy4br/>.

The study was developed following the methodological steps proposed by Peters et al. ¹⁴, namely: 1) delimitation of the title and review question; 2) definition of inclusion criteria based on the PCC (Problem or Population, Concept, and Context) strategy; 3) selection of evidence sources; 4) development of the search strategy; 5) screening and selection of identified studies; 6) data extraction using a structured form; 7) analysis and synthesis of extracted data; and 8) presentation of results.

This review addresses the following question: "What scientific knowledge has been produced on evidence of validity in CAP studies in health?".

Eligibility criteria

The eligibility criteria were defined considering the acronym PCC: Problem or Population: validation studies; Concept: related to CAP studies; and Context: applied in the health field. In addition, empirical studies without language or time limitations were selected. Studies that appeared in the searches but did not have their CAP studies in health validated were excluded.

Sources of information

The electronic search was conducted in March 2024 in eight information sources (six databases, one

virtual library, and one electronic search engine), namely: *Medical Literature Analysis and Retrieval System Online* (MEDLINE) via Pubmed, Embase, Latin American and Caribbean Health Sciences Literature (LILACS) via the Virtual Health Library (VHL), *Índice Bibliográfico Español en Ciencias de la Salud* (IBECS) via VHL, *Web of Science* (WoS), SCOPUS, *Scientific Electronic Library Online* (SciELO), and *Google Scholar*. Access to the publications in some of the information sources was obtained through the CAPES Portal, following the particularities of each information source.

The search in the gray literature was performed in *Google Scholar*,

considering the first 100 results ordered by the platform's own relevance criteria.

Search strategy

The search strategy was developed following the PCC model¹⁵, and was based on the extraction, conversion, combination, construction, and use model, adapted from Araújo¹⁶. Terms from the controlled health vocabulary - Health Sciences Descriptors (DeCS), *Medical Subject Headings* (MeSH), and *Embase Subject Headings* (EMTREE) - were used, supplemented by natural language, in order to ensure greater sensitivity and expand the retrieval of results^{16,17}.

In the LILACS, IBECS, WoS, SCOPUS, and SciELO sources, the search strategy originally developed for MEDLINE, accessed via PubMed, was used as a basis, which was duly adapted to the characteristics and structures of these information sources. In the case of Embase, due to the specificities of its controlled vocabulary and indexing system, Emtree terminology was used. For *Google Scholar*, natural language was used, prioritizing terms likely to occur in the titles of studies, in order to refine the retrieval of relevant results.

Table 1 with the search terms in MEDLINE via PubMed and Embase is shown below:

Table 1. Final search terms in the eight information sources.

Information source	Final search term	Records found	Search date
MEDLINE via Pubmed	((("Validation Study" [Publication Type] OR (Estudo de validação) OR (Validation Studies)) AND ("Health Knowledge, Attitudes, Practice"[Mesh] OR (Conhecimentos, Atitudes e Prática em Saúde) OR (Knowledge, Attitudes, Practice) OR (KAP Study))) AND ("Surveys and Questionnaires"[Mesh] OR (Inquéritos e Questionários) OR (Questionnaires and Surveys) OR (Surveys) OR (Survey Methods) OR (Questionnaires) OR (Questionnaire Designs)))	984	11/04/24
Embase	('validation study'/exp OR 'validation study' OR 'estudo de validação' OR 'validation studies'/exp OR 'validation studies') AND ('attitude to health'/exp OR 'conhecimentos, atitudes e prática em saúde' OR 'knowledge, attitudes, practice' OR 'kap study') AND ('surveys'/exp OR 'questionnaire'/exp OR 'estudos e questionários' OR 'questionnaires and surveys' OR 'survey methods' OR 'questionnaire designs') AND [embase]/lim	69	11/04/24
SCOPUS	((TITLE-ABS-KEY ((validation AND study) OR (estudo AND de AND validação) OR (validation AND studies))) AND (TITLE-ABS-KEY ((health AND knowledge, AND attitudes, AND practice) OR (conhecimentos, AND atitudes AND e AND prática AND em AND saúde) OR (knowledge, AND attitudes, AND practice) OR (kap AND study))) AND (TITLE-ABS-KEY ((surveys AND questionnaires) OR (estudos AND e AND questionários) OR (questionnaires AND surveys) OR (surveys) OR (survey AND methods) OR (questionnaires) OR (questionnaire AND designs)))	1.775	11/04/24
WoS	((TS=("validation study" OR "estudo de validação" OR "validation studies")) AND TS=("health knowledge, attitudes, practice" OR "conhecimentos, atitudes e prática em saúde" OR "knowledge, attitudes, practice" OR "kap study")) AND TS=("surveys and questionnaires" OR "estudos e questionários" OR "questionnaires and surveys" or "surveys" OR "survey methods" OR "questionnaires" OR "questionnaire designs")	04	11/04/24
LILACS via BVS	((validation study) OR (estudo de validação) OR (validation studies)) AND ((health knowledge, attitudes, practice) OR (conhecimentos, atitudes e prática em saúde) OR (knowledge, attitudes, practice) OR (kap study)) AND ((surveys AND questionnaires) OR (estudos e questionários) OR (questionnaires AND surveys) OR (surveys) OR (survey methods) OR (questionnaires) OR (questionnaire designs)) AND (db:("LILACS"))	76	11/04/24
IBECS via BVS	((validation study) OR (estudo de validação) OR (validation studies)) AND ((health knowledge, attitudes, practice) OR (conhecimentos, atitudes e prática em saúde) OR (knowledge, attitudes, practice) OR (kap study)) AND ((surveys AND questionnaires) OR (estudos e questionários) OR (questionnaires AND surveys) OR (surveys) OR (survey methods) OR (questionnaires) OR (questionnaire designs)) AND (db:("IBECS"))	46	11/04/24
SciELO	((validation study) OR (estudo de validação) OR (validation studies)) AND ((health knowledge, attitudes, practice) OR (conhecimentos, atitudes e prática em saúde) OR (knowledge, attitudes, practice) OR (kap study)) AND ((surveys and questionnaires) OR (estudos e questionários) OR (questionnaires and surveys) or (surveys) OR (survey methods) OR (questionnaires) OR (questionnaire designs))	07	11/04/24
Google Scholar	"Estudos de validação" AND "Conhecimentos, atitudes e prática em saúde" AND "Estudos e questionários" AND "Estudo CAP"	100	11/04/24

Source: research data (2024).

Study selection

Duplicate records were identified and excluded using EndNote® *software*, which automatically detects repeated studies and facilitates their removal¹⁸. In addition, the free on-line tool Rayyan was used, which contributes to the screening of titles and abstracts through a semi-automated process, offering high usability and efficiency in this stage¹⁹.

The screening and selection of studies were performed independently by two reviewers, based on reading the titles and abstracts, following the previously defined inclusion and exclusion criteria. Any disagreements at this stage were resolved by consensus between the reviewers. The selected studies were then read in full by both reviewers individually, applying the eligibility criteria. Disagreements observed in the analysis of the full texts were also resolved by consensus. The PRISMA flowchart²⁰ was used to describe the results of the search and selection of studies.

Data extraction process

A standardized data extraction tool was used for data extraction. The data extracted from the studies included: authors, year, study location (country), study objective, and classification with study design.

In addition, aspects related to CAP studies in health were collected: target audience of the study, health area involved, type of CAP (CAP only or combinations), CAP structure (items, questions, etc.), scale used (Likert, dichotomous, etc.), type of validation used, number of specialists involved, validation metrics (Cronbach, Kappa, factor analysis, intraclass correlation, etc.), reliability (internal consistency, test-retest, etc.), main findings, and limitations reported or identified.

Methodological quality assessment

The methodological quality of the studies was not assessed, as this is an

optional step in scoping reviews, as provided for in the JBI methodological guidelines²¹.

Data synthesis and presentation of results

The extracted information was compared, allowing for the preparation of a critical synthesis of the CAP studies and their validity processes. This analytical exercise made it possible to identify convergences, divergences, and complementarities between the instruments, as well as to highlight existing gaps in relation to the research question.

The extracted data were organized and presented descriptively, using charts, tables, and/or figures, in order to ensure their articulation with the investigated question, the study objectives, and the elements defined in the inclusion criteria established by the PCC strategy.

Based on the titles and abstracts of the included studies, a thematic network was developed, structured from the co-occurrence of keywords in the VOSviewer *software*. In the generated visualization, the most relevant themes in the investigated field are represented by spheres, whose size is proportional to the number of documents in which they are present. The connections between these spheres, represented by lines, indicate the strength of the relationships between the themes: the more connections originate from a sphere, the greater its centrality in the thematic network²².

The interpretation of the results was guided by the *Standards*¹³. This conceptual structure allowed us to classify and critically discuss the validation strategies used in CAP studies, highlighting the most recurrent types of evidence, which remain under-explored, and how such methodological choices impact the robustness of the conclusions.

RESULTS

A total of 2,966 records were identified in the white literature: 1,776 from SCOPUS, 988 from MEDLINE/PubMed, 76 from LILACS/BVS, 69 from Embase, 46 from IBECs/BVS, seven from SciELO, and four from WoS. In the gray literature, the first 100 results from Google *Scholar* were considered, sorted by relevance.

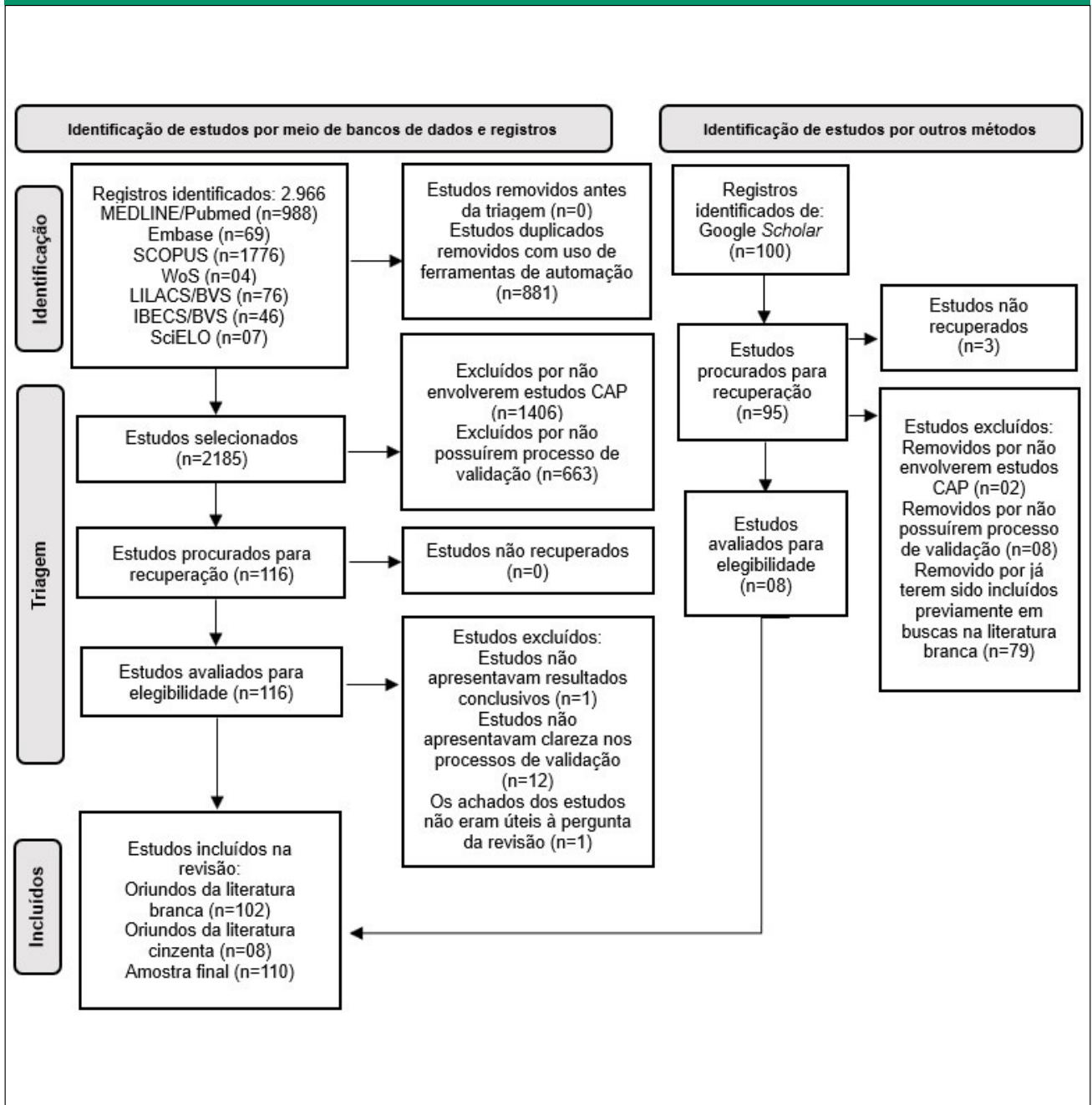
After removing 881 duplicates in the white literature, 2,085 records were screened by title and abstract. A total of 1,306 were excluded for not addressing CAP studies and 663 for lack of validation, leaving 116 for full reading. All documents were retrieved, of which 14 were excluded due to lack of conclusive results, lack of clarity in the validation processes, or inadequacy to the review question. Thus, 102 studies comprised the final sample of white literature.

In the gray literature, 95 of the 100 records were retrieved; three were not accessible, and two were excluded because they were not CAP studies. Another eight were not validated, and 79 were already included in the white literature, resulting in eight additional documents. In the end, the total sample of the review consisted of 110 studies, as detailed in the PRISMA flowchart (Figure 1).

The complete list of full references for the 110 studies included in this review is available in the supplementary material (<https://osf.io/gy4br/files/e2c34>). This file contains all the complete references for the studies identified, selected, and analyzed, in accordance with the PRISMA-ScR transparency principle.

The distribution of studies by decade of publication revealed that 61.82% of scientific productions with evidence of validity of CAP studies in health were published in the ongoing 2020s, evidencing a significant growth in interest and scientific production in this area in recent years (Table 2).

Figure 1. Flowchart of the article selection process.



Source: research data (2024), adapted from Page et al., (2021).

Regarding CAP model types, it was observed that 96.36% of the studies used only the dimensions of knowledge, attitudes, and practice, while the remaining 3.64% combined CAP with

beliefs, behaviors, concerns, or quality of life. Most of the studies focused on health professionals (31.81%). Among the most frequent response formats, Likert scales (80%) and dichotomous questions (62.72%) stood out, followed by multiple-choice

questions (16.36%). This pattern may suggest a search for more sensitive and comprehensive instruments capable of capturing different dimensions of the constructs evaluated.

Table 2. Characteristics of scientific productions (n=110).

Variable	N	%
Decade of publication		
1990	01	0,91%
2000	08	7,27%
2010	33	30%
2020	68	61,82%
Type of CAP		
CAP only	106	96,36%
CAP with combinations	04	3,64%
Target audience		
Healthcare professionals	35	31,81%
Patients	19	17,27%
Students	13	11,81%
Parents/caregivers	05	4,56%
General population	22	20%
Educators	03	2,73%
Others (employees, managers, etc.)	13	11,82%
CAP structure		
Items (statements for agreement/disagreement)	76	69,10%
Objective questions (multiple choice, true/false, yes/no)	26	23,63%
Open-ended questions (essay answers)	08	7,27%
Scale used*		
Likert scale	88	80%
Dichotomous scale (yes/no, true/false)	69	62,72%
Multiple choice	18	16,36%
Categorical scale	07	6,36%
Open-ended questions	08	7,27%
Frequency of use/score	05	4,54%
Percentage score	03	2,72%
Type of validation used**		
Content validation	92	83,63%
Face validation	36	32,72%
Construct validation	28	25,45%
Cross-cultural adaptation	25	22,72%
Panel type		
Exclusive panel (experts only)	56	50,91%
Mixed panel (experts + target audience)	13	11,82%
Not specified	41	37,27%
Validation metrics***		
Cronbach's alpha (internal consistency)	61	55,45%
CVI	28	25,45%

Factor analysis (exploratory/confirmatory)	21	19,09%
Kappa	08	7,27%
ICC	10	9,09%
KR-20/KR-21	05	4,54%
Inter-item correlation	06	5,45%
Test-retest (correlation between applications)	17	15,45%
Other metrics (regression, descriptive statistics, etc.)	09	8,18%

* Many studies use more than one type of scale in the same instrument, which is why the sum of the absolute values is greater than the total number of studies analyzed.

** Many studies used more than one type of validation in the same instrument, reflecting methodological rigor and the search for greater robustness in the evaluation of CAP instruments.

*** Many studies used multiple validation metrics to ensure the robustness of the instruments, so the percentages added up exceed 100%.

CVI: Content validity index; ICC: Intraclass correlation coefficient; KR-20/KR-21: Kuder-Richardson.

Source: prepared by the authors (2024).

Regarding the type of validity evidence, content-related validation was seen in 83.63% of the publications. Concerning the type of panel, 50.91% of the studies had a panel composed exclusively of expert judges. To evaluate validation metrics, many studies used more than one aspect of psychometric quality, notably Cronbach's alpha (55.45%) and content validity index (25.45%). On the other hand, 19.09% sought to demarcate evidence of internal structure validity and submitted the CAP to factor analysis. These data highlight the methodological rigor and commitment to the robustness of the instruments developed for health research.

When analyzing the types of validity evidence used in the studies analyzed, it was noted that some terms still follow old nomenclatures, which have been updated as psychometrics evolves. The Standards¹³ indicate that what was previously called "content validity" and "face validity" are now considered evidence of validity related to the content

of the instrument. "Construct validity," on the other hand, is related to evidence involving the internal structure of the test. This change shows that validity is not something static, but a continuous process in which an instrument accumulates different types of evidence that prove whether it actually measures what it is intended to measure. In other words, a test can only be considered valid when it is tested in various ways and contexts that confirm the reliability of its results.

Figure 2 shows the geographical origin of the 110 studies with evidence of CAP validity in health, with a predominance of Asia, accounting for 83 publications (75.46%). The most frequent countries were India, Iran, Malaysia, and China, indicating a high investment in the adaptation and validation of instruments in multicultural and multilin-

gual contexts. Europe contributed 10 studies (9.09%), standing out for the use of rigorous psychometric methods and the participation of countries such as Spain, Romania, and Ireland. The Americas recorded nine productions (8.18%), with an emphasis on Brazil, the United States, and Ecuador, demonstrating a field that is expanding but still limited in comparison to the region's potential.

Africa presented eight studies (7.27%), with significant participation from countries such as South Africa and Egypt, reflecting emerging initiatives to validate instruments adapted to local realities. No production was identified in Oceania, suggesting a geographical or methodological gap. These results point to a concentration of scientific production in Asian countries, with other continents making more modest contributions, but with potential for growth.

Figure 2. Geographic distribution of scientific production (n=110).



Source: prepared by the authors (2024).

The thematic network identifies two major clusters in the mapping (Figure 3). The separation between the two clusters, although not absolute, shows that there is a core of studies focused on the application of studies and another dedicated to their development and validation.

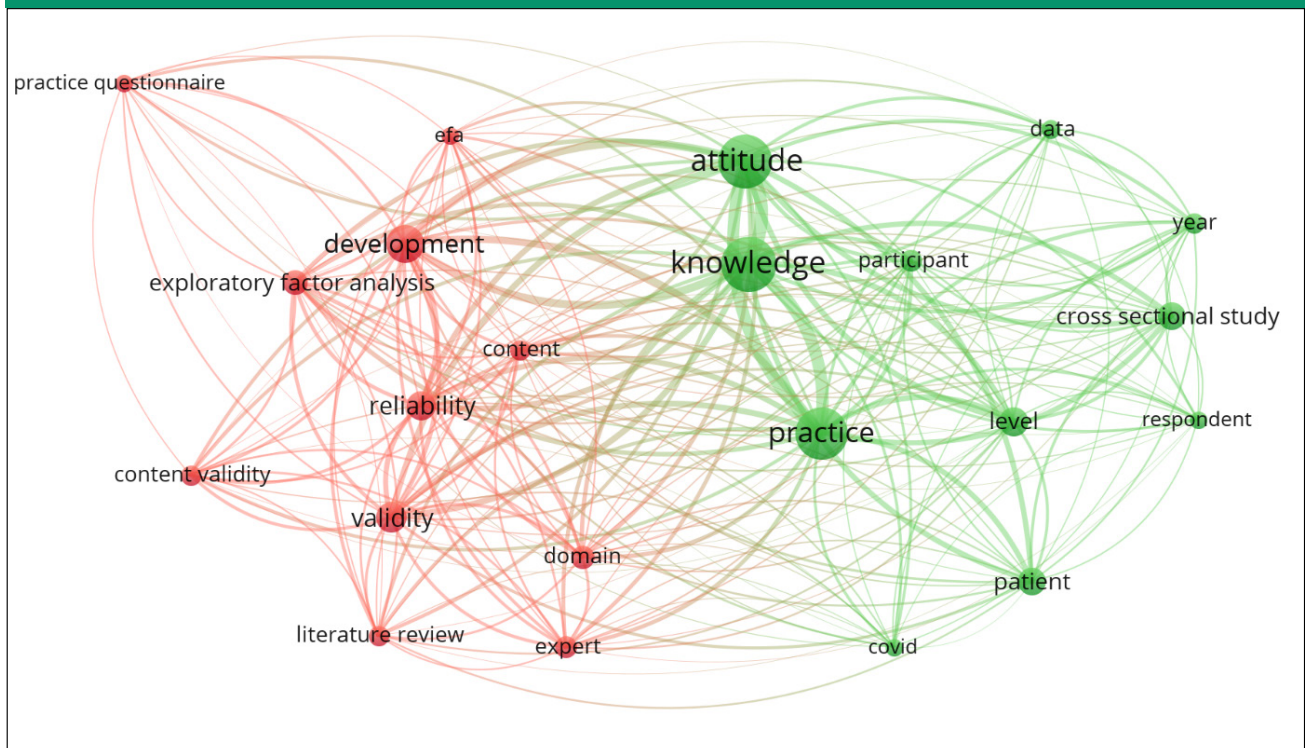
The first, represented in green, groups terms related to the empirical application of CAP studies. In this cluster, the words “knowledge,” “attitude,” and “practice” stand out, reflecting the three central domains of the studies. In addition, terms such as “participant,” “patient,” “respondent,” “data,” and “cross-sectional

study” appear, suggesting that most of the studies analyzed used a cross-sectional design focused on measuring levels of knowledge, attitude, and practice in different populations. The presence of the term “covid” indicates that part of the recent scientific production addressed topics related to the pandemic. This cluster therefore reveals a strand of the literature dedicated to empirical research on health behaviors based on already consolidated or previously validated instruments.

The second cluster, shown in red, is related to the development and validation of CAP instruments.

Words such as “development,” “validity,” “reliability,” “content validity,” “exploratory factor analysis,” and “expert” show that several studies included in the sample prioritized rigorous methodological processes for instrument construction. The use of exploratory factor analysis, consultation with experts to assess content validity, and verification of internal consistency through reliability indicators are strongly represented aspects. Terms such as “literature review” and “domain” also suggest the theoretical basis underlying the study construction process.

Figure 3. Map of keyword co-occurrence in studies with evidence of validity of CAP studies in health (n=110).



Source: prepared using VOSviewer (2024).

DISCUSSION

The complete references for all studies included in the review and cited throughout this discussion are available in the supplementary material (<https://osf.io/gy4br/files/e2c34>).

[io/gy4br/files/e2c34](https://osf.io/gy4br/files/e2c34).

The analysis of the validity evidence of CAP studies revealed a diversity of strategies that need to be aligned with the typology defined by *the Standards*. There was a concentration of studies that sought only validity evidence related to content

and the use of old terms, misaligned with the theoretical proposal of *the Standards*¹³.

What was previously called “content validity” and “face validity” came to be understood as evidence of validity related to the content of the test. The so-called

“construct validity” corresponds to evidence linked to the internal structure of the instrument. This change shows that validity is not a static characteristic, but a continuous process in which the instrument accumulates different types of evidence that support whether it actually measures what it proposes to measure.

Thus, a test can only be considered valid when it is examined in multiple forms and contexts capable of confirming confidence in its results. This terminological update reflects the evolution of psychometric theory, which currently conceives validity not as a fixed property, but as a dynamic and cumulative process, in which the instrument acquires validity as it undergoes different evaluation procedures, accumulating evidence that supports or questions its adequacy.

CAP studies have been used in a variety of strategic health topics, demonstrating their broad applicability and potential to generate useful information for policies and programs. Among the topics mapped in the review are pharmacovigilance²³⁻²⁵, antibiotic use^{26,27}, patient safety²⁸, immunization²⁹, health misinformation³⁰, worker health³¹, food and nutrition³²⁻³⁶, health literacy³⁷, infectious diseases³⁸⁻⁴³, travel medicine^{44,45}, traffic safety⁴⁶⁻⁴⁸, pharmacogenomics⁴⁹, deprescribing⁵⁰, nursing care, teaching, and assistance⁵¹⁻⁵⁵ and tobacco control⁵⁶.

Regarding content validity evidence, most studies sought to ensure that the items in the instruments adequately represented the domains of interest, based on specialized literature and technical judges, thus ensuring the relevance and comprehensiveness of the measured content. Most CAP studies focus on ensuring that items are consistent, representative, and appropriate to the construct, with special attention to the language used to ensure their understanding by the target audience⁵⁷⁻⁶⁴. Although this step is essential, it alone does not prove that the instrument effectively measures the construct in different contexts.

Regarding evidence of validity related

to response processes, there are still few studies investigating how respondents understand and process items, which limits understanding of the suitability of instruments for different audiences and cultural contexts, highlighting a gap to be filled in future research.

According to the *Standards*¹³, neglecting to analyze response processes can lead to interpretation biases, poor cultural adaptation, and compromised comparability of results. The absence of this evidence in CAP studies highlights a critical methodological gap, which requires qualitative and quantitative investigations that explore how respondents with different profiles understand and attribute meaning to items, ensuring greater robustness and intercultural validity of the instruments.

Evidence of validity associated with the internal structure of the instruments, in turn, has been explored using robust techniques such as exploratory and confirmatory factor analyses, Item Response Theory, and other approaches for analyzing latent structures, but these are still under-explored in the validation of CAPs^{30,65-80}. These analyses are essential to demonstrate the correspondence between the theory underlying the instrument and the empirical data, which supports the validity of the interpretations of the scores generated.

In addition, aspects such as invariance between groups and temporal stability, which are important for the use of instruments in different populations and in longitudinal assessments, remain insufficiently investigated, limiting the applicability of CAP instruments in varied contexts.

The analysis of response formats also revealed the concomitant use of Likert-type scales, dichotomous questions, and multiple-choice questions in the same instrument in several studies. Although this practice is interpreted as a sign of methodological flexibility, in light of the *Standards*¹³ such a combination constitutes a relevant limitation. The choice of

response format should be aligned with the construct to be measured, since differences in the nature of the scales directly impact response processes, score comparability, and, above all, the evaluation of the internal structure of the instruments.

The mixing of heterogeneous metrics without theoretical justification or adequate statistical treatment can compromise the validity of the instrument, generate distortions in factor analyses, and reduce the accuracy of inferences. Therefore, the uncontrolled variation in response formats highlights a methodological gap to be addressed in future research, which should adopt greater rigor in defining response types, justifying their choices, and applying analyses appropriate to the level of measurement of the items

When analyzing the correlations between the components of the CAP model, it was observed that, although there is confirmation of the positive relationship between knowledge and attitude^{51,81-84}, the association between knowledge and practice is often weak or nonexistent⁸⁵⁻⁸⁷. Several studies reinforce the hypothesis that attitudes function as mediators, acting as a sensitive link between knowledge and practice^{44,88-98}.

This pattern shows that behavioral change goes beyond the simple acquisition of knowledge or the formation of favorable attitudes, involving broader contextual factors such as socioeconomic and cultural conditions, social support, and other social determinants of health. These elements directly influence individuals' ability and motivation to transform knowledge and attitudes into effective practice, highlighting the need for integrated approaches that consider the social environment in which the CAP is inserted.

This interaction between components can be interpreted as evidence of the test's validity in relation to other variables, previously called "criterion validity" and now reorganized by the *Standards*¹³ as evidence of validity related to relationships with external variables.

These external relationships are also manifested in the influence of sociodemographic factors on CAP scores. Variables such as education, income, gender, age, and location were frequent modulators^{81,85,99-116}. This variability reinforces the need to adapt instruments to different sociocultural contexts and to stratify results, promoting a more equitable interpretation and application, which also constitutes evidence of validity related to external variables.

With regard to the consequences of the assessment, educational interventions that used CAP instruments demonstrated a positive impact in the areas of knowledge, attitude, and practice^{44,48,88,90,117-120}. These findings indicate that, although educational actions are effective in positively modifying CAP scores, their sustainability depends on practical reinforcement and continuous evaluation over time.

In addition, analysis of the consequences of testing reveals a recurring pattern: the presence of favorable attitudes does not always translate into effective changes in practice^{24,25,55,86,91,96,112,116,121-126}. This phenomenon may be related to individual factors, such as insecurity, low self-efficacy, and lack of behavioral reinforcement, which limit the implementation of the practice even in potentially favorable contexts. This distinction between individual limitations and structural, cultural, and organizational barriers is essential for planning targeted interventions, which should address both awareness and the strengthening of motivation and personal commitment.

Another point seen in 22.72% of the sample in this scoping review was the cross-cultural adaptation of other CAP studies. Some studies^{127,128}, for example, followed similar methodological steps, including direct translation and back-translation, review by a committee of experts, and pilot application to verify the clarity and cultural equivalence of the items. Both sought to adapt international instruments, ensuring evidence of validity

related to content and internal structure. Among the difficulties reported were cultural differences, the elimination of items with low consistency, and the limited size of the samples.

Despite following recommended procedures for translation and semantic equivalence, according to the *Standards*, cross-cultural adaptation still represents an initial stage in the validation process, since it does not, in itself, constitute sufficient evidence of validity. Furthermore, the use of small and convenient samples limits the generalization of results, reinforcing the need for further research to consolidate more robust psychometric evidence and support the use of instruments in different intercultural contexts.

Barriers such as institutional resistance, training deficiencies, social stigmas, infrastructure limitations, and work overload have been frequently described in the literature^{40,45,47,85,91,95,108,115,119,126,129-132}. Within the scope of the CAP dimensions, these external factors demonstrate that, even with adequate knowledge and positive attitudes, the implementation of the practice can be compromised.

This dissociation between domains reveals that behavior depends not only on knowledge and desire, but also on the actual ability to act within viable contexts. Therefore, isolated educational interventions may be insufficient, and intersectoral approaches that promote organizational changes and structural support are necessary to ensure lasting behavioral changes.

Despite advances, there are gaps, especially in the evidence of the validity of response processes and in the longitudinal evaluation of the consequences of applying CAP instruments. Strengthening these areas can increase the robustness of the evidence of validity and ensure that the instruments fulfill their role in promoting effective changes in health, in line with international best practices for measurement.

Although CAP is widely applied to different health topics, the validity of

the inferences drawn from it depends on systematic adherence to the five sources of evidence recommended by the *Standards*. The absence or insufficiency of one or more of these sources may compromise the comparability, generalizability, and practical usefulness of the results, making it essential that future studies prioritize transparent descriptions and robust analyses of validity in its different aspects.

FINAL CONSIDERATIONS

It is concluded that the current state of knowledge on evidence of validity in CAP studies in health shows advances, but also fragmentation and incipience of approaches to the five sources of evidence recommended by the *Standards for Educational and Psychological Testing*, which reinforces the need for more integrated methodological strategies that are sensitive to the sociocultural context.

The review shows that, although there have been advances, gaps still persist that compromise the comparability, generalization, and sustainable use of CAP studies in different contexts. These gaps are concentrated in the scarcity of evidence related to response processes, the internal structure of instruments, invariance between groups, longitudinal evaluation of the consequences of application, diversity of response formats within the same instrument, as well as the geographical concentration of scientific production in certain regions. Thus, this study can guide researchers in the selection and adaptation of existing CAP instruments, in addition to supporting the development of new instruments with greater technical rigor, theoretical foundation, and cultural sensitivity.

As a limitation, we acknowledge the absence of an assessment of the methodological quality of the included studies, an optional step in scoping reviews, but one that could enrich the understanding of the robustness of the evidence. It is also possible that, even with a comprehensive search without temporal or linguistic re-

strictions, some relevant studies were not located due to limitations in the descriptors or indexing of the information sources used.

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