

ChecKAP: A Checklist for Reporting a Knowledge, Attitude, and Practice (KAP) Study

Fatemeh Zarei¹, Arezoo Dehghani^{2,3}, Amornrat Ratanasiri⁴, Mohtasham Ghaffari⁵, Sunil K Raina⁶, Aram Halimi^{7,8}, Sakineh Rakhshanderou⁵, Sherzad Ali Ismael⁹, Parisa Amiri⁷, Asiye Aminafshar¹⁰, Alireza Mosavi Jarrahi^{11*}

Abstract

Introduction: The Knowledge, Attitudes, and Practices (KAP) model is a foundational tool in public health research. KAP surveys play a vital role in this process by gauging a population's current level of knowledge about a specific health issue. Rigorous evaluation is essential for ensuring the validity and reliability of KAP studies. Therefore, in this study, a comprehensive checklist for reporting Knowledge, Attitude, and Practices (KAP) Studies was developed. **Methodology:** This study was conducted using a systematic six-step roadmap. A comprehensive review of available relevant quality assessment tools led to the development of specific new items. An expert panel reviewed the initial draft, and after corrections were made, the second draft was finalized and subjected to psychometric analysis by experts. **Results:** The development of ChecKAP (Checklist for Reporting Items for Knowledge, Attitude, and Practice) represents a significant contribution to KAP studies. The final tool consists of 46 items across 8 fields: title (1 item), abstract (6 items), keywords (1 item), introduction (6 items), method (11 items), findings (7 items), discussion (15 items), and conclusion (1 item). **Conclusion:** ChecKAP assesses the inherent complexity of KAP research methods and ensures consistent reporting. It fills an important gap in the KAP research literature and serves a dual purpose. First, it acts as a quality assessment tool for reviewers, enabling them to evaluate the methodological rigor and clarity of submitted manuscripts. Second, it serves as a guideline for authors, promoting a more systematic and transparent approach to reporting.

Keywords: Knowledge- practice- attitude- checklist- guideline

Asian Pac J Cancer Prev, 25 (7), 2573-2577

Introduction

The Value of KAP-Designed Studies in Public Health Research

The Knowledge, Attitudes, and Practices (KAP) model is a foundational tool in public health research. It offers a systematic approach to understanding health behaviors, empowering researchers to design impactful interventions and assess their success. Knowledge, Attitudes, and Practices surveys play a vital role in this process by assessing the current level of knowledge within a population regarding specific health issues. This

knowledge is instrumental in crafting targeted health education messages that resonate with the intended audience [1, 2].

Knowledge, Attitudes, and Practices studies extend beyond knowledge assessment to identify behaviors that contribute to health risks. This information is crucial for developing targeted interventions that promote healthier practices within the population [3]. Moreover, KAP surveys reveal misconceptions and cultural influences that shape health behaviors. By uncovering these barriers, researchers can create effective strategies to address them and ultimately promote positive behavior change [4].

¹Department of Health Education and Health Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Iran. ²Safety Promotion and Injury Prevention Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. ³Health in Disasters and Emergencies Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran. ⁴Department of Community Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, 40002, Thailand. ⁵Department of Health Education and Health Promotion, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran. ⁶Department of Community Medicine, Dr. RP Government Medical College, Tanda, Himachal Pradesh, India. ⁷Research Center for Social Determinants of Health, Research Institute for Endocrine Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran. ⁸Department of Epidemiology, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran. ⁹Professor of Community Medicine and Public Health, Head of Faculty of Public Health, Kurdistan Higher Council of Medical Specialties, Erbil, Iraq. ¹⁰Health in Disasters and Emergencies Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran. ¹¹Department of Social Medicine, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran. *For Correspondence: rmosavi@yahoo.com

Additionally, KAP surveys establish baseline data that allows for measuring the effectiveness of health education efforts over time [4]. This empowers policymakers to allocate resources efficiently, directing interventions to the areas where they are most needed [1].

The Diverse Applications of KAP Surveys

The versatility of KAP surveys is evident in their wide range of applications across various public health domains. They are instrumental in designing, implementing, and evaluating public health interventions [4, 5]. In disease prevention, KAP studies help identify knowledge gaps and misconceptions that may hinder the adoption of preventive measures [5]. The model is also applied in health education to tailor messages and programs to address specific knowledge and attitude gaps, ultimately influencing behaviors toward healthier practices [4, 6].

The reach of KAP surveys extends to a multitude of public health topics, including nutrition [7], environmental health [8], and chronic disease management [9]. These diverse applications showcase the effectiveness of the KAP model in contributing to the development of targeted and impactful strategies for behavior change and overall improvement in public health.

Difficulties and Gaps of KAP Studies

While the KAP model offers a valuable framework, KAP studies are not without their challenges. These challenges can compromise the quality and, ultimately, the reliability of the findings. One common pitfall lies in the design of the survey instrument itself. Poorly designed questions that do not align with the study's objectives can lead to the collection of irrelevant data [3, 4]. Additionally, ambiguous or leading questions can elicit unreliable responses, skewing the overall results [10, 11].

Furthermore, inconsistent data collection practices by inadequately trained surveyors or the use of unrepresentative samples can introduce inaccuracies in the findings [11]. Cultural nuances can also pose a challenge. If the survey instrument does not account for these nuances, respondents may misinterpret questions, leading to misleading data [4, 5].

Another potential gap in KAP studies lies in the discrepancy between reported behaviors and actual practices. Respondents may report behaviors that they believe are socially desirable rather than their true actions [3]. Solely relying on quantitative data can also provide an incomplete picture. Combining quantitative data with qualitative insights can offer a more nuanced understanding of attitudes and the complexities of behavior change [3].

Inadequate data analysis can further hinder the interpretation of findings, potentially leading to incorrect conclusions [11]. Finally, without follow-up studies, it is difficult to determine if observed changes in knowledge and attitudes translate into sustained changes in behavior [11]. Underestimating the resources and time required to conduct a robust KAP study can also compromise its quality [4, 12].

By acknowledging these potential pitfalls and taking steps to mitigate them, researchers can ensure the integrity

of their KAP studies and maximize their contribution to public health initiatives.

The Need to Evaluate KAP Studies Correctly

Rigorous evaluation is essential for ensuring the validity and reliability of KAP studies. Several key considerations come into play when evaluating these studies. First and foremost, the survey questions should be demonstrably aligned with the specific goals and objectives of the study [3, 4]. As mentioned previously, a clear, unbiased, and straightforward question design is crucial for obtaining reliable data [10, 11]. Proper training of surveyors ensures consistent data collection practices across the study population [13]. Utilizing the correct sampling methods and ensuring an adequate sample size is essential for generating data that can be generalized to the larger population [11].

Cultural sensitivity in the survey instrument design is critical to avoid misinterpretations by respondents from diverse backgrounds [4, 5]. Incorporating mixed methods, which combine quantitative and qualitative data collection strategies, can provide a more comprehensive understanding of the factors influencing health behaviors [3]. Proper statistical methods are necessary to accurately analyze the collected data and draw meaningful conclusions [11]. Follow-up studies are instrumental in assessing the sustainability of behavior change within the target population [11].

Finally, allocating adequate resources and time throughout the research process is essential for conducting a high-quality KAP study that yields valuable insights for public health interventions [4, 12]. By adhering to these evaluation principles, researchers and public health professionals can ensure that KAP studies contribute meaningfully to the development of effective strategies for promoting positive health behaviors and improving population health outcomes. Therefore, we have developed a comprehensive checklist to evaluate the reporting of a Knowledge, Attitude, and Practices (KAP) study. This checklist is designed to capture a broad range of insights into the methodology, helping us gain a concise understanding of reporting the method of a KAP study.

Materials and Methods

In developing a robust tool designed to serve both as a quality assessment instrument for reviewers and a quality improvement guideline for authors reporting Knowledge, Attitude, and Practices (KAP) study results, a systematic six-step roadmap was meticulously followed. A core working committee, comprising experts in epidemiology, health promotion, and patient education, laid the groundwork for the guideline by developing an initial draft. This draft was then reviewed, commented on, and improved by a scientific committee consisting of editors and scientists in the field of KAP studies in health educational interventions and relevant fields. The entire development process consisted of six steps (detailed below). Additionally, three independent reviewers/editors were involved in step 5 (evaluating the reliability of the tool). The details of all steps are listed as follows:

Step one

A core working committee of four experts will develop the first draft of the guideline by going through the following steps:

Comprehensive review of available relevant quality assessment tools, (both generic and specific) This section had been done by a scoping review.

a. Extracting important and relevant items from these tools and adapting these items to develop the guideline's specific items.

b. Developing new specific items which may not be covered by previous tools.

c. Holding several rounds of online meetings to finalize the first draft of the tool, based on the selected items of steps b and c

Step two

After developing the first draft, we will form a "scientific committee" including at least 10 editorial experts from different countries, various journals, and international societies. The core working committee will collaborate with scientific committee members to obtain their comments and suggestions for draft items using a pre-defined electronic form that aims to:

a. Assessing the current items of the first draft of this tool, regarding some criteria such as necessity and applicability.

b. Suggest any correction or revision to current items

c. Suggest any new items to be added to the first draft

Step Three

After collecting the scientific committee comments on the draft, the core working committee provided a first final draft to be presented in an online meeting with all scientific and core working committee members to discuss this version after a mini-workshop (to describe the consensus procedure). At the end of the meeting, all final corrections made and the semi-final version will be approved via the consensus of meeting members to be used in further surveys.

Step Four

We conducted an online survey of at least 10 reviewers on the semi-final version of this tool, to assess the face and content validity of the tool via a quantitative rating of each item (based on importance, clarity, etc.) and a written comments and opinion if available. Considering the results of this step, this tool was revised again by the core working committee and a new revised tool was developed.

Step Five

In this step, we conduct another online survey including 30 previously accepted and 30 rejected manuscripts. All these papers were assessed by three independent reviewers using our new revised tool. The data was analyzed to calculate inter-observer reliability. If any item could not obtain enough reliability scores, it was revised or removed by a consensus between these three reviewers and core working committee members.

Step Six

The final suggestions to finally revise this tool are provided to prepare the final version of this tool. Inviting scientific committee members, another online meeting was held, and all final changes were presented in this meeting. At the end of this meeting, the final tool is approved by all members of both committees (core working and scientific).

Results

The findings of this study are organized into two sections:

a) Interpretation of Tool Components: This section provides an analysis of the various components of CheckKAP, a comprehensive checklist consisting of 46 items. CheckKAP serves as a detailed guide for the reporting of Knowledge, Attitude, and Practices (KAP) studies.

T1

Delving into specific sections, the Title (T) encompasses one item, T1, instructing authors to craft a title that explicitly conveys the nature of the study, the subject of KAP, and the studied population.

A1 to A4 and K1

In the Abstract (A) section, spanning A1 to A4, authors are guided on structuring a well-informed abstract. This includes detailing the objective, methods, results, and conclusion in a manner that prioritizes quantitative details. Additionally, the use of keywords (K) is emphasized with one item, K1, urging authors to ensure their keywords align with the MeSH catalog.

I1 to I6

Transitioning to the Introduction (I) section, six critical items (I1 to I6) provide a roadmap for establishing the research context, articulating the research problem, highlighting the significance of the study, conducting a literature review, identifying knowledge gaps, and precisely outlining study objectives.

M1 to M11

In the Methods (M) section, spanning M1 to M11, authors are directed to meticulously detail the Study design, Sampling Technique, Sample size, Data Collection Instrument, Main Constructs /Variables, Data analysis, and Ethical consideration.

R1 to R7

The Results (R) section, consisting of eight items (R1 to R7), ensures a comprehensive presentation of participant characteristics and findings related to knowledge, attitudes, and practices. Participant Flow, Participant Characteristics, Reporting of KAP's Findings, Further Analysis-relating KAP to other variables.

D1 to D15

The Discussion (D) section, with six items (D1 to D15), prompts authors to interpret KAP results, provide scientific justifications, and draw comparisons with

relevant studies while addressing the limitations inherent in cross-sectional study designs and considering cultural contexts.

C1

Concluding the manuscript, the Conclusion (C) section encompasses one item (C1), guiding authors in summarizing study results and implications for practice and further studies (see all items in Appendix).

b) Psychometric assessment of ChecKAP: This section covers the tool’s psychometric properties, including form validity, content validity, and reliability. In the quantitative component, the report details the assessment of ChecKAP’s face, content, and construct validity, as well as its reliability.

Item generation

The pool of items in this study comprised a total of 60 items generated from the literature review. Subsequently, the items were subjected to a rigorous process of reduction and summarization, and any overlapping items were carefully examined. After the research team conducted three rounds of evaluations, 54 items were selected for inclusion in the primary instrument based on their psychometric properties.

Validity

Content validity

The content validity ratio (CVR) of six items was less than 0.416, resulting in their removal from the tool. Two items also had a content validity index (CVI) of less than 0.79 and were eliminated. The overall CVI of the tool was 0.992. After conducting the content validity assessment, the tool with 46 items.

Face validity

After evaluating the content validity of the tool and making necessary modifications, both quantitative and qualitative face validity were conducted. After receiving feedback from the authors, necessary modifications were made to 12 items, and since the impact score of all items was higher than 1.5 no item was removed.

Reliability

In the initial phase, the overall reliability of the ChecKAP was reported as adequate with a Cronbach’s alpha of 0.988. The effect of removing each item on Cronbach’s alpha was also assessed and showed that

deleting individual items had minimal impact on the overall alpha coefficient (Table 1).

Discussion

The development of ChecKAP (Checklist for Reporting Items for Knowledge, Attitude, and Practice) represents a significant contribution to KAP (Knowledge, Attitude, and Practice) studies. Currently, KAP research suffers from methodological and reporting inconsistencies, making it difficult to compare findings across studies. ChecKAP addresses this challenge by providing a standardized reporting framework, similar to established checklists used in other research areas, such as STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) [14] (Moher 2009), SPIRIT (Standard Protocol Items: Recommendations for Interventional Trials) [15], REPCAN (REporting Population-based CANcer Registry Data) [16], AIMRDA (Critical Appraisal Tool for the Peer-Review of Studies Assessing the Anticancer Activity of Natural Products) [17], and CONSORT (Consolidated Standards of Reporting Trials) [18]. These established checklists have demonstrably improved the quality and transparency of reporting in their respective fields.

ChecKAP, STROBE, and SPIRIT all promote rigorous research reporting but target distinct study designs. STROBE addresses observational studies in epidemiology, where researchers examine relationships between factors. SPIRIT focuses on interventional trials testing the effect of an intervention. ChecKAP’s innovation lies in its tailored approach to Knowledge, Attitude, and Practice (KAP) studies. It ensures comprehensive reporting of how these specific elements are measured, addressing a critical gap in a field often lacking standardized reporting practices.

ChecKAP acknowledges the inherent complexity of KAP research methodologies and recognizes the need for consistent reporting practices. Its development involved a meticulous three-step process, including collaboration between a core working committee and a scientific committee. This collaborative approach ensures the checklist’s comprehensiveness and relevance to the field. The resulting 45-item ChecKAP aligns with the conventional structure of a scientific manuscript, meticulously guiding authors through reporting essential elements, from title formulation to result interpretation.

ChecKAP fills a critical gap in the KAP research

Table 1. Cronbach's alpha, Kappa Agreement, CVI, and CVR for ChecKAP

Domain of ChecKAP	Initial items	Items after revised	Cronbach's alpha (N=30)	Kappa	CVR	CVI
Title	1	1	0.998	1	0.75	1
Abstract and keywords	6	5	0.998	1	1	1
Introduction	7	6	0.988	1	0.958	1
Method	14	11	0.976	1	1	1
Results	9	7	0.978	1	0.968	1
Discussion	9	15	0.964	1	0.65	1
Conclusion	14	1	0.986	0.894	0.843	0.875
Total	60	46	0.988	0.984	0.897	0.992

literature, serving a dual purpose. Firstly, it functions as a quality assessment tool for reviewers, enabling them to evaluate the methodological rigor and transparency of submitted manuscripts. Secondly, it acts as a quality enhancement guideline for authors, encouraging a more systematic and transparent approach to reporting. By promoting these qualities, ChecKAP fosters increased comparability of research findings and elevates the overall methodological rigor within KAP studies. ChecKAP transcends its practical application to become a transformative initiative with the potential to redefine the standards of KAP research reporting.

Author Contribution Statement

Dr. Fatemeh Zarei contributed to conceptualization, methodology, and writing the original draft. Dr. Arezoo Dehghani contributed to Methodology, writing the original draft and editing. Dr. Amornrat Ratanasiri was involved in writing, reviewing, and editing the manuscript. Prof. Mohtasham Ghaffari and Prof. Sunil Raina both provided supervision and contributed to reviewing and editing the manuscript. Mr. Aram Halimi contributed to methodology and writing the original draft. Dr. Sakineh Rakhshanderou provided supervision and was involved in reviewing and editing the manuscript. Prof. Sherzad Ali Ismael, Prof. Parisa Amiri, and Mrs. Asiye Aminafshar all contributed to writing, reviewing, and editing the manuscript. Prof. Alireza Mosavi Jarrahi provided supervision, contributed to writing, reviewing, and editing, and handled correspondence.

Acknowledgements

This study was funded partially by a grant from Shahid Beheshti University of Medical Sciences (grant number 43002970) and with the logistical support from the West Asia Organization for Cancer Prevention (APOCP's West Asia Chapter).

Ethical Approval

This study received ethical approval from the Shahid Beheshti University of Medical Sciences Ethics Committee (IR.SBMU.CRC.REC.1401.027).

Conflict of Interest

The authors declare no conflict of interest.

References

- Andrade C, Menon V, Ameen S, Kumar Praharaj S. Designing and conducting knowledge, attitude, and practice surveys in psychiatry: Practical guidance. *Indian J Psychol Med.* 2020;42(5):478-81. <https://doi.org/10.1177/0253717620946111>.
- Kumar KVN, Bindhu DG, Likhitha K, Charani MS, Priya ND, Gowthami Y. Cancer literacy in women: A kap exploration of breast and gynecological cancers accompanied by cross-sectional based online survey in tirupathi district. *Asian Pac J Environ Cancer.* 2024;7(1):3-10.
- Glanz K, Rimer BK, Viswanath K. Theory, research, and practice in health behavior and health education. 2008.
- Gumucio S, Luhmann N, Fauvel G., Zompi S, Ronsse A, Courcaud A, Bouchon M, Trehin C, Schapman S, & Cheminat, O. Data collection quantitative methods, the kap survey model (knowledge, attitude and practices) IGC communigraphie; Saint Etienne, France: 2011.
- Sybill G, Merica M, Luhmann N, Fauvel G, Zompi S, Ronsse A, et al. The kap survey model (knowledge, attitude and practices). Retrieved from. 2011.
- Kifle K, Kebede L, Taye J, Mekonnen A, Ibrahim I, Abebe M, et al. Assessment of awareness and attitude on cervical cancer prevention among female preparatory students in ziwai town, oromia regional state, ethiopia. *Asian Pac J Cancer Care.* 2020;5(4):265-71.
- Mariás YF, Glasauer P. Guidelines for assessing nutrition-related knowledge, attitudes and practices. 2014 Sep 24.
- Wang R, Yang Y, Chen R, Kan H, Wu J, Wang K, et al. Knowledge, attitudes, and practices (kap) of the relationship between air pollution and children's respiratory health in shanghai, china. *Int J Environ Res Public Health.* 2015;12(2):1834-48. <https://doi.org/10.3390/ijerph120201834>.
- Akalu Y, Ayelign B, Molla MD. Knowledge, attitude and practice towards covid-19 among chronic disease patients at addis zemen hospital, northwest ethiopia. *Infect Drug Resist.* 2020;13:1949-60. <https://doi.org/10.2147/idr.S258736>.
- Bongaarts J. The KAP-gap and the unmet need for contraception. *Population and development review.* 1991 Jun 1:293-313.
- Hunger AA. Conducting KAP surveys: a learning document based on KAP failures. New York: ACF International. 2013.
- Papasteri C, Letzner R, Pascal S. Pandemic kap framework for behavioral responses: Initial development from lockdown data. *Curr Psychol.* 2024;43:1-13. <https://doi.org/10.1007/s12144-024-05670-w>.
- Valente TW. Evaluating health promotion programs. Oxford University Press; 2002 Feb 7.
- von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The strengthening the reporting of observational studies in epidemiology (strobe) statement: Guidelines for reporting observational studies. *J Clin Epidemiol.* 2008;61(4):344-9. <https://doi.org/10.1016/j.jclinepi.2007.11.008>.
- Chan AW, Tetzlaff JM, Altman DG, Laupacis A, Gøtzsche PC, Krleža-Jerić K, et al. Spirit 2013 statement: Defining standard protocol items for clinical trials. *Ann Intern Med.* 2013;158(3):200-7. <https://doi.org/10.7326/0003-4819-158-3-201302050-00583>.
- Roshandel G, Badar F, Barchuk A, Roder DM, Sangrajrang S, Mery L, et al. Repcan: Guideline for reporting population-based cancer registry data. *Asian Pac J Cancer Prev.* 2023;24(9):3297-303. <https://doi.org/10.31557/apjcp.2023.24.9.3297>.
- Ahmad R, Riaz M, Aldholmi M, Qureshi MA, Uddin S, Bhat AA, et al. Development of a critical appraisal tool (aimrda) for the peer-review of studies assessing the anticancer activity of natural products: A step towards reproducibility. *Asian Pac J Cancer Prev.* 2022;22(12):3735-40. <https://doi.org/10.31557/apjcp.2021.22.12.3735>.
- Schulz KF, Altman DG, Moher D. Consort 2010 statement: Updated guidelines for reporting parallel group randomised trials. *BMJ.* 2010;340:c332. <https://doi.org/10.1136/bmj.c332>.



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