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Noela Prasad
Victoria University

Gail Ormsby
Avondale College of Higher Education, gail.ormsby@avondale.edu.au

Robert P. Finger
University of Bonn

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• Investigation •

Validating a tool to assess eye health knowledge, attitude and practice in Cambodia and Vietnam

Noela Prasad[1,2], Gail M Ormsby[3,4], Robert P Finger[5]

[1]Institute for Health and Sport, Victoria University, Melbourne, VIC 3011, Australia
[2]VACCHO, Collingwood, VIC 3066, Australia
[3]Professional Studies, Faculty of Business, Education, Law and Arts, University of Southern Queensland, West Street, Toowoomba, QLD 4350, Australia
[4]Lifestyle Research Centre, Avondale College of Higher Education, Cooranbong, NSW 2265, Australia
[5]Department of Ophthalmology, University of Bonn, Regina-Pacis-Weg 3, Bonn 53113, Germany
Correspondence to: Gail M Ormsby. Professional Studies, Faculty of Business, Education, Law and Arts, University of Southern Queensland, West Street, Toowoomba, QLD 4350, Australia. go.gailormsby@gmail.com
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Abstract

• AIM: To develop an eye health knowledge, attitude and practice (EH-KAP) field-based assessment tool for use in implementing effective eye health care services.

• METHODS: An instrument development and validation study. A Vietnam EH-KAP dataset were used to identify and eliminate redundant questions to develop a standardized tool. Face validity was assessed by the KAP survey team. Internal validity (congruency/criterion) was assessed by comparing descriptive analysis of two datasets (*n*=531; *n*=38) collected from the same sampling frame at different time points. Weighted scores were calculated for each construct. Kappa values for test-retest and inter-observer agreement were calculated to check the reliability of responses. The modified version was assessed by analysing the raw and ungrouped data. Responses were weighted and agreement was tested by comparing construct scores.

• RESULTS: Totally 38 respondents were included in this validation process (mean age 58.5y). Mean scores for knowledge were 9.15 (old questionnaire *n*=531) and 5.05 (modified version). For attitude, the scores were 2.23 and 2.42, and for practice the scores were 3.33 and 2.21. Test-retest agreement was between 62% to 93% (Kappa 0.24 to 0.86) for the ungrouped raw data, and 55% to 72% (Kappa 0.42 to 0.65) for KAP domain. Inter-observer Kappa value for ungrouped data was 0.37 and 0.45 for the weighted scores.

• CONCLUSION: This standardized tool applied at critical time points can assess trends in KAP within the same population and for comparison across groups. If used alongside a Rapid Assessment of Avoidable Blindness (RAAB), this tool provides a comprehensive perspective on eye-health of a population.

• KEYWORDS: validation; knowledge; attitude; practice; eye health; knowledge, attitude and practice; questionnaire

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INTRODUCTION

Knowledge, attitude and practice (KAP) surveys have been utilised to gain a cross-sectional snap-shot of behavioural patterns within populations[1-2]. When administered at baseline, and again at the end of the project, this tool can evaluate change in KAP in response to specific interventions or programs[1-2]. Therefore, applying information from prior experience, we developed a tool to assess KAP related to eye health. The intention was to use a KAP assessment not only to inform health promotion and policy, but also to assess effectiveness as a part of the programme planning cycle. This paper describes the process of standardizing a valid tool that reliably measures KAP concerning eye health, since there was no standardized tool identified in the literature.

SUBJECTS AND METHODS

Ethical Approval Ethics approval was obtained from the Royal Victorian Eye and Ear Hospital, the Takeo, Thanh Hoa and Nghe An Provincial Health Departments. The study followed the tenets of the Declaration of Helsinki. Permissions were granted by local authorities to conduct field-work. Oral consent was obtained from each participant after they received information regarding the project and their queries were clarified in the local dialect. No incentive or monetary compensation was provided for participation.

Definitions Three attributes to be measured using this tool in the target community were knowledge, attitudes and intended practice, which are defined as follows. Knowledge possessed by a community is their understanding of that topic or the

level of correct factual knowledge. Attitude refers to people's feelings and perceptions toward eye care and services as well as any preconceived ideas they may have towards it[3]. Practice is defined as previous and intended future use of eye care services.

Exploratory Surveys Despite the importance of assessing KAP as a part of the planning cycle for eye health programs, a literature search failed to identify any standardized tool for measuring these constructs. Interviewer administered surveys were conducted in Takeo Province in Cambodia (2010; *n*=599)[2], and in Son La (2010; *n*=300), Thanh Hoa (2009; *n*=274) and Nghe An (2009; *n*=257) provinces of Vietnam (unpublished) prior to commencing programmes for the delivery of eye care services funded through the Australian Avoidable Blindness Initiative Program. Different methodology and data collection instruments had been used at each location, so these data were used to inform the development of a generic validated KAP survey tool.

Tool Development and Validation This validation study was conducted during August 2013. Initially, face validity and content validity of the "original" KAP questionnaire (Thanh Hoa and Nghe An) were reviewed. Criteria assessed 1) adequacy of response options; that is, whether at face value, the questions appear to elicit valid responses, 2) construct and content validity, by examining whether all relevant aspects of the construct were covered. The tool was then revised to eliminate redundant questions and to collapse response options. It was translated into Kinh (Vietnamese), assessed again to ensure face and content validity in the Vietnamese context. Finally, it was back-translated into English, and reviewed by bilingual eye-health workers.

Procedure Phase 1: Identified which constructs a particular item sought to answer. For example, the first construct knowledge, comprising factually correct information obtained from a trusted and accessible source, related to three "items of interest" - specific disease conditions, treatment options, and costs incurred. Phase 2: Clarified the questions. Two criteria were applied to clarify each question: a) ensure the question measured a discrete domain (attribute/trait/variable) that informs a single construct; b) check for redundancy of attribute/trait/variable questions. Phase 3: Eliminated redundant questions. Phase 4: Checked the appropriateness of context, ensuring the question was framed to measure what it intended to, within both the English and Kinh questionnaires.

To ensure a rigorous assessment, guidelines were provided as a manual of operation (in English and Kinh) to be used as a reference point during data collection. The questionnaire was then pre-tested in Thanh Hoa Province by a health centre nurse, a community representative, two district hospital nurses, one NGO development worker, an individual with low vision, and an interpreter. For example, the process involved a role-play; where a nurse administered the questionnaire to a community representative, while another nurse observed and followed the English translation. All responses and limitations were noted and rectified according to the socio-cultural context.

Due to the absence of a gold standard against which knowledge, attitude or practice could be assessed, the former (2009/2010) versions of the eye health knowledge, attitude and practice (EH-KAP) tool were assumed to be the "criterion" against which the revised tool was compared.

Reliability The final questionnaire (Vietnamese version) was used for reliability testing among sixteen adults chosen to represent the range of possible respondents. This involved the intentional inclusion of people with a disability and ensured gender equity.

Gauging reliability was especially important because this tool was intended to measure change over time. Test-retest and inter-observer reliability were assessed, with the results reported in this paper. Ten volunteers (interviewers) were trained to explain the purpose of this survey to potential respondents and to administer the survey tool. They were informed of their responsibilities on the research team, and were asked to read through the questionnaires (item-by-item review of the questions, including skip patterns and special instructions), and data entry screens to ensure that they understood the questions, definitions and process of performing quality checks. The sampling strategy was explained, with emphasis on the respondent selection procedures. The interviewers were taught interview techniques, listening skills, confidentiality procedures, and how to obtain informed consent from respondents. An "effective interview" process was demonstrated to reinforce this knowledge. Finally, inter-observer reliability among the ten trained interviewers and test-retest reliability using different groups of respondents were conducted.

Field Testing The manual of operations and data collection tool were field-tested in a village setting. Two villages were randomly selected from a commune in the district of Thanh Hoa, using the same methodology and inclusion criteria as had been used for the previous KAP survey conducted in 2009. In each village, a random start was identified and houses on the left side of the street were consecutively visited until a total of 30 individuals aged 30y or more were surveyed. Back-calculating from the previous KAP survey conducted in Thanh Hoa and Nghe An Provinces, it was evident that by surveying a sample of 530 people from a sampling frame that comprised the general population of 4 000 000 (or, if stratified sampling was done, a subgroup of 1 400 000 people above 30 years of age), we can measure "adequate knowledge related to eye health" with 95% confidence, if 10% of the sample has "adequate knowledge".

Weighting and Scores We applied weighting arbitrarily based on the richness of information obtained through the baseline surveys, as well as the "value" of accurate knowledge for each item, with the latter based on clinical evidence. For example, "People with diabetes should have their eyes examined once a year", was assigned a maximum weight of 1.0, as it aligned with clinical guidelines, and "the treatment for diabetic eye disease includes surgical treatments", was assigned a relatively lower weight of 0.25. The rationale was that it is of greater value to preserve the eye health of an individual. That is, it is more important that a person with diabetes knows they need an annual eye examination, relative to the value of knowing what treatment options exist.

The scoring system was applied to the responses to obtain the weighted summary scores for each domain. Based on the questions and response options obtained from both questionnaires, the maximum obtainable score in the "old" version of the questionnaire for Knowledge was 7.50, and 3.00 for attitude, while the maximum practice obtainable score with the "old" questionnaire was 9.00. The scoring system and weighting of response items are depicted in Table 1.

Data Management and Statistical Analysis Two Vietnamese health personnel were trained to enter data into the customised form developed in Microsoft Access. Data were cleaned, and where possible, missing data were traced from the original questionnaires. Analysis was performed in STATA 8.2 (StataCorp. College Station, Texas, USA).

Criterion validity was assessed by comparing descriptive analyses of the two datasets obtained from Thanh Hoa. The first dataset had been elicited using the "old" questionnaire, and the second using the tool that was being tested (congruency). Kappa values were calculated from the results of the test-retest and inter-observer reliability testing using SPSS (version number 10, IBM, Chicago, USA).

RESULTS

A total of 38 respondents were included in this validation process. Of the sixteen respondents that could accurately provide their age, eight were over 50 years of age (four men and four women), and eight between 30 to 50 years of age. The mean age was 58.5 years (95%CI 52.9-64.2). The four representatives of each gender from each age stratum included individuals with a seeing/hearing/mobility/understanding disability and at least one person who had type 2 diabetes mellitus, as well as individuals who had no formal education and were illiterate, individuals who had completed some education but not beyond primary school, and individuals who had completed high school (at least 12y of formal education).

Following a construct and face validity assessment, the questions were grouped together and arranged in a logical sequence. Any potentially redundant questions or responses were identified, and questions were modified based on the data and where data was lacking, modification were based on a review of literature. The "old" version of the questionnaire had 100 questions for "service users" and collected information on demographics, knowledge of common eye diseases, attitude of the interviewee regarding eye diseases, attitude of the interviewees towards people with disabilities, practice related to management and prevention of eye problems, knowledge and practice of prevention and treatment of children's eye diseases, and accessibility and affordability of eye care services. Following the revision process, the tool contained 50 questions, collecting: "general information" including demographic details (10 questions), 13 questions pertaining to the domain that measured the construct knowledge, 7 questions for attitude, and 8 for practice.

Two sets of "additional questions" were included: 8 questions pertaining to individuals who self-reported having diabetes mellitus, and 4 questions for individuals who reported having required correction of refractive error. The revised tool targeted only service users, and took approximately 30min to administer. A descriptive analysis of the three attributes measured in the two datasets, collected from the same sampling frame at different points in time is presented for comparison. The first dataset was acquired using the "old" unmodified version of the questionnaire and the second dataset of the modified tool. The constructs (KAP) are referred to as "domains" once they have been measured through assigning scores to responses for questions relating to each construct.

Based on the same scoring system (Table 1), using the responses from the revised tool, the maximum score obtainable for knowledge was 14.75, and the minimum score was 0.25. For attitude, the maximum and minimum scores were 4.25 and 0.25 respectively, and for practice the scores obtainable were 8 and 0.25 respectively. The section titled "additional questions", comprised of questions directed to individuals who self-reported having diabetes mellitus, and to people who reported having been advised spectacle correction. The knowledge domain for persons with diabetes had a maximum obtainable score of 1.0 for knowledge; attitude had 1.5 and practice had 1.75. All three domains had a minimum obtainable score of 0.25. The sub-group that had been advised spectacle correction responded to questions related to knowledge (maximum obtainable score 0.75) and practice (maximum obtainable score 3.25).

To assess reliability, "raw data" were analysed across the entire range of 212 response options that comprised the revised tool. Subsequently, individual responses were weighted by applying scores, and agreement was tested across the eight domain scores. Test-retest and inter-observer agreement results are depicted in Table 2.

Table 1 Scoring system for responses elicited by the EH-KAP tool

Knowledge	
Poor nutrition can cause decreased vision or blindness	0.25
Vitamin A deficiency can cause decreased vision or blindness	0.25
Sunlight can cause decreased vision or blindness	0.25
Complications of other diseases can cause decreased vision or blindness	0.25
Decreased vision or blindness can be genetic	0.25
Eye injury can cause decreased vision or blindness	0.25
Old age can cause decreased vision or blindness	0.25
Cataract can cause decreased vision or blindness	0.25
Trachoma/Trichiasis can cause decreased vision or blindness	0.25
Corneal ulcers can cause decreased vision or blindness	0.25
Glaucoma can cause decreased vision or blindness	0.25
Diabetic retinopathy can cause decreased vision or blindness	0.25
Age-related macular degeneration can cause decreased vision or blindness	0.25
Other variations describing a known cause of decreased vision or blindness	0.25
Poor vision or blindness can be prevented	1
Red-eye can be prevented by avoiding sharing towels and other personal items	0.25
Red-eye can be prevented by washing hands	0.25
Red-eye can be prevented by avoiding touching or rubbing infected eyes	0.25
Other variations describing a known method of preventing “red-eye”	0.25
Red-eye can be treated by washing eyes	0.25
Red-eye can be treated by eye drops	1
Other variations describing a known method of treating “red-eye”	0.25
The best way to prevent or treat blurred vision or refractive error is avoiding reading or watching television	0.25
The best way to prevent or treat blurred vision or refractive error is to use spectacles or contact lenses	1
The best way to treat cataract is to protect eyes from sunlight when outdoors	0.25
The best way to treat cataract is to stop smoking	0.25
The best way to treat cataract is surgical removal	1
The best way to treat cataract is to use spectacles	0.25
Other variations describing a known method of treating cataract	0.25
The best way to prevent trachoma is facial cleanliness	0.25
The best way to prevent trachoma is environmental hygiene	0.25
Other variations describing a known method of preventing trachoma	0.25
Ways to treat trachoma/Trichiasis are antibiotics	0.25
Ways to treat trachoma/Trichiasis are surgery to correct trichiasis	0.25
Other variations describing a known method of treating trachoma / trichiasis	0.25
Ways to prevent corneal ulcers are by using eye protection in high risk situations	1
Ways to prevent corneal ulcers are by hygienic use of contact lenses	0.25
Other variations describing a known method of preventing corneal ulcers	0.25
Ways to treat corneal injury and ulcers are by instilling eye drops	0.25
Ways to treat corneal injury and ulcers are by getting immediate medical attention	1
Other variations describing a known method of treating corneal ulcers	0.25
Attitude	
We seek treatment when a member of my family or I have an eye problem	1
If we did not go for treatment, this could be because doctor advised that immediate treatment is not required	0.25
If we did not go for treatment, this could be because we are waitlisted for scheduled treatment	0.25
If we did not go for treatment, this could be because of being medically unfit for surgery	0.25
Other variations describing a valid reason for not undergoing treatment	0.25
People with a disability get appropriate care	1

Table 1 (Continued)

Knowledge	
A child who has a disability can go to a normal school	1
A child who has a disability can go to a special school	0.25
Practice	
I get my eyes checked more than once a year	0.5
I get my eyes checked at least once a year	1
I get my eyes checked whenever I have a problem (less than once a year)	0.25
I sought treatment for my eye problem	1
To treat eye problems, I go to the commune health station	0.25
To treat eye problems, I go to the village health worker	0.25
To treat eye problems, I go to the district hospital eye unit	0.25
To treat eye problems, I go to the provincial eye hospital	0.25
To treat eye problems, I go to a private doctor/hospital	0.25
To treat eye problems, I go to the opticals/glasses shop	0.25
Other variations describing a valid eye care service provider	0.25
I have a health insurance card	0.5
I use my health Insurance to obtain subsidies for treatment of eye problems	1
To protect my eyes, I use clean water to wash my face frequently	0.25
To protect my eyes, I avoid sharing personal items like towels	0.25
To protect my eyes, I wear eye protection when working or driving	0.25
To protect my eyes, I wear sunglasses when outdoors	0.25
To protect my eyes, I wear a hat when outdoors	0.25
To protect my eyes, I get my eyes checked periodically	0.25
To protect my eyes, I eat health and vitamin A-rich foods	0.25
Other variations describing a valid practice that protects the eyes	0.25
Modified practice	
I have had the inside of my eyes examined for diabetic eye disease	1
Diabetes Mellitus knowledge	
People with diabetes should have their eyes examined once a year	1
People with diabetes should have their eyes examined once in six months	0.5
Modified attitude	
A person with diabetes needs an eye examination even if his/her blood sugar levels are stable	1
The treatment for diabetic eye disease includes controlling blood sugars	0.25
The treatment for diabetic eye disease includes laser	0.25
The treatment for diabetic eye disease includes surgical treatments	0.25
Modified knowledge	
I use my glasses (or contact lenses) for near vision only	0.25
I use my glasses (or contact lenses) only for viewing distant objects	0.25
I use my glasses (or contact lenses) only for viewing both near and distance	0.25
Modified practice	
My glasses were prescribed at the government hospital	0.25
My glasses were prescribed at a private hospital/clinic	0.25
My glasses were prescribed at the opticals/glasses shop	0.25
My glasses were purchased at the eye hospital	0.25
My glasses were purchased at the district eye unit	0.25
My glasses were purchased at the opticals/glasses shop	0.25
My glasses were purchased at the market (or at another shop except a specific spectacles shop)	0.25
My glasses were not purchased by me; someone donated the glasses or purchased them for me	0.25
Other variations describing a valid person/place from where glasses were purchased	0.25
When I wear my glasses (or contact lenses) I can see more clearly	1

Table 2 Results of test-retest and inter-observer agreement

Group	Raw data		Domain scores	
	Agreement (%)	Kappa value (SE)	Agreement (%)	Kappa value (SE)
Interviewer test-retest agreement				
Interviewer 1	87.03	0.71 (0.07)	54.55	0.42 (0.10)
Interviewer 2	90.43	0.73 (0.06)	54.55	0.46 (0.10)
Interviewer 3	88.59	0.74 (0.07)	54.55	0.42 (0.10)
Interviewer 4	89.73	0.80 (0.07)	45.45	0.37 (0.09)
Interviewer 5	85.56	0.72 (0.06)	54.55	0.50 (0.09)
Interviewer 6	87.50	0.74 (0.07)	63.64	0.53 (0.11)
Interviewer 7	92.97	0.86 (0.07)	63.64	0.53 (0.11)
Interviewer 8	93.48	0.86 (0.07)	63.64	0.53 (0.11)
Interviewer 9	91.44	0.84 (0.07)	63.64	0.59 (0.10)
Interviewer 10	88.83	0.78 (0.06)	63.64	0.59 (0.10)
Respondent inter-observer agreement				
Respondent 1	84.32	0.66 (0.06)	72.73	0.65 (0.12)
Respondent 2	61.70	0.24 (0.06)	63.64	0.59 (0.10)
Respondent 3	73.51	0.39 (0.06)	72.73	0.65 (0.12)
Respondent 4	77.54	0.52 (0.06)	54.55	0.47 (0.10)
Respondent 5	75.68	0.52 (0.06)	63.64	0.53 (0.11)
Respondent 6	85.33	0.70 (0.07)	54.55	0.42 (0.11)

Validity was further assessed to determine the extent to which the tool measured constructs it intended to measure. This was achieved through comparing the results obtained using the "old" questionnaire on the larger group, with the results of administering the "revised" tool to a small sub-group within the sampling frame of the larger KAP study conducted in Thanh Hoa/Nghe An Provinces (2010, *n*=531).

Internal validity was assessed by comparing scores obtained by the two groups for each of the three constructs–knowledge, attitude and intended practice. The mean scores for knowledge were 9.15 (*n*=38, 95%CI 8.47 to 9.83) and 5.05 (*n*=531, 95%CI 4.92 to 5.17) in the dataset elicited by the smaller and larger groups respectively. For attitude, the scores were 2.23 (*n*=38, 95%CI 2.03 to 2.43) and 2.42 (*n*=531, 95%CI 2.37 to 2.47), and for practice, the scores were 3.33 (*n*=38, 95%CI 2.95 to 3.71) and 2.21 (*n*=531, 95%CI 2.10 to 2.31).

The overall total scores for the KAP survey were 15.23 (*n*=38, 95%CI 14.18 to 16.29) for the validation sub-sample and 9.68 (*n*=531, 95%CI 9.48 to 9.87) for the larger sample.

Power and Effect Size Back-calculating from the KAP survey previously conducted in Than Hoa and Nghe An Provinces, it was evident that by surveying a sample of 530 people from a sampling frame comprising a general population of 4 000 000 (or, if stratified sampling was done, a sub-group of 1 400 000 people above 30 years of age), "adequate knowledge" may be measured with 95% confidence.

DISCUSSION

This research followed a rigorous scientific process to validate a standardised KAP tool as a component of a comprehensive eye-health field assessment. The approach addressed inconsistencies in methodology and weaknesses in previous KAP surveys. The EH-KAP tool proved to be a reliable and valid instrument to assess KAP related to eye health at community level in Vietnam. Using this tool alongside other cross-sectional survey such as the Rapid Assessment for Avoidable Blindness (RAAB) surveys may provide valuable additional information necessary for successful healthcare planning and implementation[4].

Health-related behaviour is most often assessed through KAP surveys, though other research methods may be used either alongside a social survey or as an alternative to it[5-6]. KAP surveys can provide information useful to a range of stakeholders and informs health promotion campaigns and strategies, the development of health promotion materials. KAP surveys are also a method of assessing effectiveness of interventions to improve health and can hence inform health policy[7]. When used to understand health behaviour, data collected from a KAP survey complements, and in fact often leads to deeper investigation through focus group discussions or in-depth interviews[1]. One of the key characteristics of research into KAP is to employ appropriate methodology: though a KAP survey provides a standardized ecological overview, it may only uncover the first layer of "truth" and deeper investigation through qualitative research is often essential. This is possibly one reason for the paucity of validated tools to study KAP, and why psychometric testing is rarely performed or reported[1,7-8]. Further, being population- or site-specific by nature, generalizability of data obtained through a KAP

survey is inevitably limited. The questions in this tool are intentionally open-ended to ensure richness of data, though future researchers may modify response options for ease of administration by the interviewers, and to the local context.

In the field of eye care, KAP studies have primarily been used to explore behaviour in well-defined groups of individuals, often in relation to a specific disease condition or intervention[9]. At the time of commencing this validation, a review of published literature revealed no report of a KAP survey having been conducted at baseline to inform the delivery of eye care interventions in the target population. Consequent to the global initiative to eliminate avoidable blindness (VISION 2020: The Right to Sight), systematic assessments of eye and vision related morbidity have formed the basis of planning national programmes for elimination of avoidable blindness.

Though there is evidence that barriers exist to the uptake of eye-care services among specific groups[10-18], yet no systematic tool is available to assess these barriers at baseline to inform programme planning, and at end-line to assess effectiveness of the programme in overcoming these barriers. Applying a standard measure throughout the planning cycle will result in more efficient and effective delivery of eye-care services to a target population.

Development of a questionnaire, instrument or tool for data collection de novo involves a series of processes to ensure that the resulting tool is valid, reliable and responsive to change[19-20]. To revise this KAP questionnaire, prior experience from both the Cambodia KAP survey (n=599) and from the surveys conducted in Son La (n=300) Thanh Hoa and Nghe An (n=531) Provinces of Vietnam were built upon by adding/rephrasing questions and expanding response options through a review of relevant literature. In an effort to ensure that the phrasing of questions was acceptable, the generic English tool was translated and tested repeatedly. This was done to maximize validity and to eliminate potential response bias resulting from racial or ethnic cultural experience or the lack of it[21-23]. The result is a simple, standardized and focused tool that can be applied repeatedly over time (3-5y) to assess trends in KAP within the same population and for comparison across groups. Though the scoring system applied was the same, the total scores obtainable are different for each of the two questionnaires. This is partly because in the old questionnaire, though the number of individual items scored was more numerous, several questions measured a single trait (redundancy), and some questions that were included have in fact been proven to be inappropriate[24]. However, narrow confidence intervals around total scores suggest that precision has not been compromised, and the larger scores obtainable with the revised questionnaire possibly leaves room for greater responsiveness to change.

A good tool would be valid, reliable and sensitive to change. Construct validity (congruent) and responsiveness to change can be assessed from data collected at sequential time-points during the project cycle[25]. It is also essential that for construct validity of a tool to be demonstrated, the domain scores or more realistically in this context, scores obtained to individual questions (item scores) must correlate with related verifiable variables. For example, reported utilization of health care facilities may be verified using hospital records[26]. From the survey reported here and the previous (2009) KAP survey in the same Province, it may be surmised to a certain extent that the data obtained adequately reflects actual KAP within the local community. This assumption was based on informal discussions and feedback obtained from both the respondents and the interviewers during the process of pre-testing and revising the tool. However, identifying and measuring variables such as these concurrently is not feasible in the present context. What remains unclear and needs consideration when using tools such as this one, is the possible impact of non-sampling errors on response reliability[27]. Though such errors have may be insignificant, in certain cultures such as in Vietnam, contextual issues such as household-level effects may influence health-seeking behaviour[28]. For fully informed planning of an eye care programme to serve a given population, rapid assessments such as the RAAB and EH-KAP surveys can be supplemented with audits and inventories of available manpower and materials (human resource capability, infrastructure and equipment) from the perspective of service providers[29]. This survey instrument used alongside a RAAB, provides a comprehensive perspective on the eye-health in a population, an inference deduced also in Cambodia[3,30-31].

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