

Translation and Validation of the Filipino Version of the Knowledge, Attitudes and Practices Questionnaire on Personal Antibiotic Use (KAPQ-PAU-FIL): Potential Utility in Public Health Programs in the Philippines



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ABSTRACT

Introduction: The growing misuse of antibiotics and the escalating threat of antibiotic resistance in the Philippines pose significant public health concerns. While various Knowledge, Attitudes and Practices (KAP) questionnaires on personal antibiotic use have been employed in local studies, none have

been fully validated and a standardized, culturally appropriate tool remains lacking.

Objective: This study aims to develop a Filipino-translated and culturally adapted KAP questionnaire on personal antibiotic use (KAPQ-PAU-FIL) and evaluate its validity and reliability.

Methodology: The research consisted of two phases. The first phase is the translation and

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cross-cultural adaptation of the original questionnaire in collaboration with the *UST Sentro sa Salin at Araling Salin*. The second phase is the validity and reliability testing of the KAPQ-PAU-FIL using a sample of 176 Filipino adults. This included assessment of its face validity, content validity, construct validity, internal consistency, test-retest reliability and equivalent forms reliability.

Results: Most items were translated without difficulty, though four items were modified to better fit the linguistic and cultural context. The KAPQ-PAU-FIL demonstrates strong psychometric properties, with face validity (SFVI/Ave = 0.99), content validity (SCVI/Ave = 0.99), construct validity (CFI = 0.92, RMSEA = 0.06, SRMR = 0.04; FL = 0.60-0.85; ITC = 0.58-0.71), test-retest reliability (ICC = 0.83), internal consistency (α = 0.929) and equivalent forms reliability ($p > 0.05$; κ = 0.62-0.74).

Conclusion: The KAPQ-PAU-FIL is the first ever, Filipino-translated, culturally adapted questionnaire designed to assess KAPQ-PAU-FIL, demonstrating strong validity and reliability to support public health programs against antibiotic misuse.

Key Words: Translation, validation, KAP questionnaire, antibiotic, Philippines

INTRODUCTION

The irrational and inappropriate use of antibiotics has led to the rise of antibiotic resistance, which has been considered a global threat of growing concern. The advent of this crisis is putting at risk the established worth of antibiotics, which has a pivotal role in the field of medical science as it is used in the prevention and treatment of diseases caused by pathogenic bacteria.[1] In antibiotic resistance, bacteria have decreased response to the use of antibiotics and the range of antibiotics that can be used to treat a certain condition becomes limited. Hence, this problem is considered as one of the greatest challenges to public health globally.[2]

In the Philippines, the lack of knowledge and awareness regarding proper antibiotic use has led to the wrong usage of antibiotics by the public. Improper practices that contribute to the rise of antibiotic resistance in the country involve both misuse and overuse of antibiotics. Locally prevalent examples include not finishing the entire course of

prescribed treatment when symptoms subside, use of antibiotics against viral and fungal diseases, and inappropriate self-medication (shotgun therapy). Indeed, the rise of antibiotic resistance necessitates policy formation and public health programs that would encourage best practices among the public to avoid drug-resistant infections.[3]

The use of Knowledge, Attitude and Practices (KAP) questionnaires had been widely considered as an important tool in the implementation of public health programs, particularly in understanding behavioral patterns on a certain health-related subject. It can establish a reference value that could be used in future assessments, thereby helping to measure the effectiveness of health education activities. In relation to antibiotic use, the KAP questionnaire would assess the following three dimensions: Knowledge (what the respondents know about antibiotics), Attitude (what the respondents think or believe about antibiotics) and Practice (what they do regarding antibiotics).[4]

As directed by the World Health Organization (WHO), health strategies to address antibiotic resistance involve community interventions which serve to increase awareness and change behavior towards proper use of antibiotics. Therefore, determining the effectiveness of such interventions includes the administration of KAP questionnaires pre- and post-intervention that would be able to measure the change in KAP in the target population. In line with this, a specific scientific milestone was achieved as a fully validated KAP questionnaire on personal antibiotic use (KAPQ-PAU-FIL) was developed by Mallah, et al.[4] demonstrating strong psychometric properties, with face validity ($0.78 \leq$ item-level content validity index (I-CVI) ≤ 1.00), content validity (scale-level content validity index (S-CVI)/Ave = 0.95), construct validity (comparative fit index (CFI) = 0.92, root mean square error of approximation (RMSEA) = 0.044, standardized root mean square residual (SRMR) = 0.047), internal consistency (α = 0.62), and response rate (95.85%). Designing and validating a KAP questionnaire on this healthcare issue was much needed to fill this gap in research given the long-standing recognition of antibiotic resistance globally. While Arabic and French translations of the questionnaire are already available,[4] there is no local version of this questionnaire in the Philippines that has been adapted both linguistically and culturally.

That said, the primary objective of this study was to develop a Filipino translation and cultural adaptation of the KAP questionnaire on personal antibiotic use and assess its psychometric properties in terms of its validity and reliability. The development of such a tool is crucial for public health programs and in making intercultural and international comparisons between the Philippines and other nations. It could also be an important tool for policymakers in developing intervention strategies that would reflect specific local circumstances and the cultural factors that influence them. Hence, data obtained from the KAPQ-PAU-FIL would be beneficial in the planning and implementation of public health programs that are suited to the Filipino population.

METHODS

Study Population and Sample Size

The study was conducted in Metro Manila, Philippines and was accomplished for 10 months between March 2024 and December 2024. The study population comprised of Filipinos from ages 18 to 64 who were able to understand and read English and Filipino and residents of Metro Manila. On the other hand, respondents with cognitive impairment or clinical conditions that would hinder self-administration of the KAPQ-PAU-FIL were excluded from the study. The research questionnaire used for data collection was deployed online via Google Forms.

Based on the recommended minimum participant-to-item ratio of 5:1 in questionnaire validation studies,[5,6] the original KAPQ-PAU-FIL, which consists of 27 items, requires a minimum of 135 participants for psychometric testing. To ensure adequate statistical power, a slightly higher ratio was adopted, setting the base sample size at 160. After factoring in a 10% non-response rate, the final required sample size was calculated to be 176 participants.

Study Design

This study has two phases: (1) translation and cross-cultural adaptation and (2) assessment of its psychometric properties via validity and reliability testing (Figure 1).

Phase I: Translation and Cross-Cultural Adaptation: Prior to the start of the study, the researchers first contacted authors of the original

questionnaire and obtained permission to translate and validate the questionnaire. Since there was no specified protocol by the original authors of the instrument, the researchers sought approval of the guidelines from Beaton, et al.[7] to be used for the translation and adaptation process. In collaboration with the *UST Sentro sa Salin at Araling Salin*, the original questionnaire was translated into Filipino by two independent forward translators separately. The two translations were then synthesized by a third party to produce a common translation. Two back translators then translated back the Filipino version to the original version. Afterwards, an expert committee review was done which involved a methodologist, healthcare professional, language professional and translators (both the forward and back translators). The committee consolidated all versions of the questionnaire and developed a pre-final version. During the pre-testing stage, the pre-final version of the KAPQ-PAU-FIL underwent pilot testing using 30 participants and cognitive debriefing using 15 participants through a virtual interview via Google Meets to determine their understanding of each instruction, question and response option. Any necessary modifications were then made, thereby creating the final version of the KAPQ-PAU-FIL.

Phase II: Validity and Reliability Testing: In this phase, the psychometric properties of the KAPQ-PAU-FIL were evaluated. This included an assessment of the questionnaire's validity (face, content and construct validity) and reliability (test-retest reliability, internal consistency, equivalent forms reliability).

For face validity, 15 volunteer test respondents who were part of the target population reviewed the questionnaire to assess the presentation and relevance of the KAPQ-PAU-FIL as to whether the items in the questionnaire appear to be relevant, reasonable and unambiguous. The sample size was determined following the recommendation by Yusoff [8] who suggested a minimum acceptable number of 10 raters. Participants were requested to judge the clarity of each item based on a 4-point scale (1 = item is not clear; 2 = item is somewhat clear; 3 = item is quite clear; 4 = item is highly clear). Afterwards, the I-FVI (item-level face validity index) which pertains to the proportion of test respondents giving an item a clarity rating of 3 or 4 and S-FVI (scale-level face validity index) which is the average of the I-FVI scores for all items were calculated. The criterion for accepting the I-FVI was set at a minimum

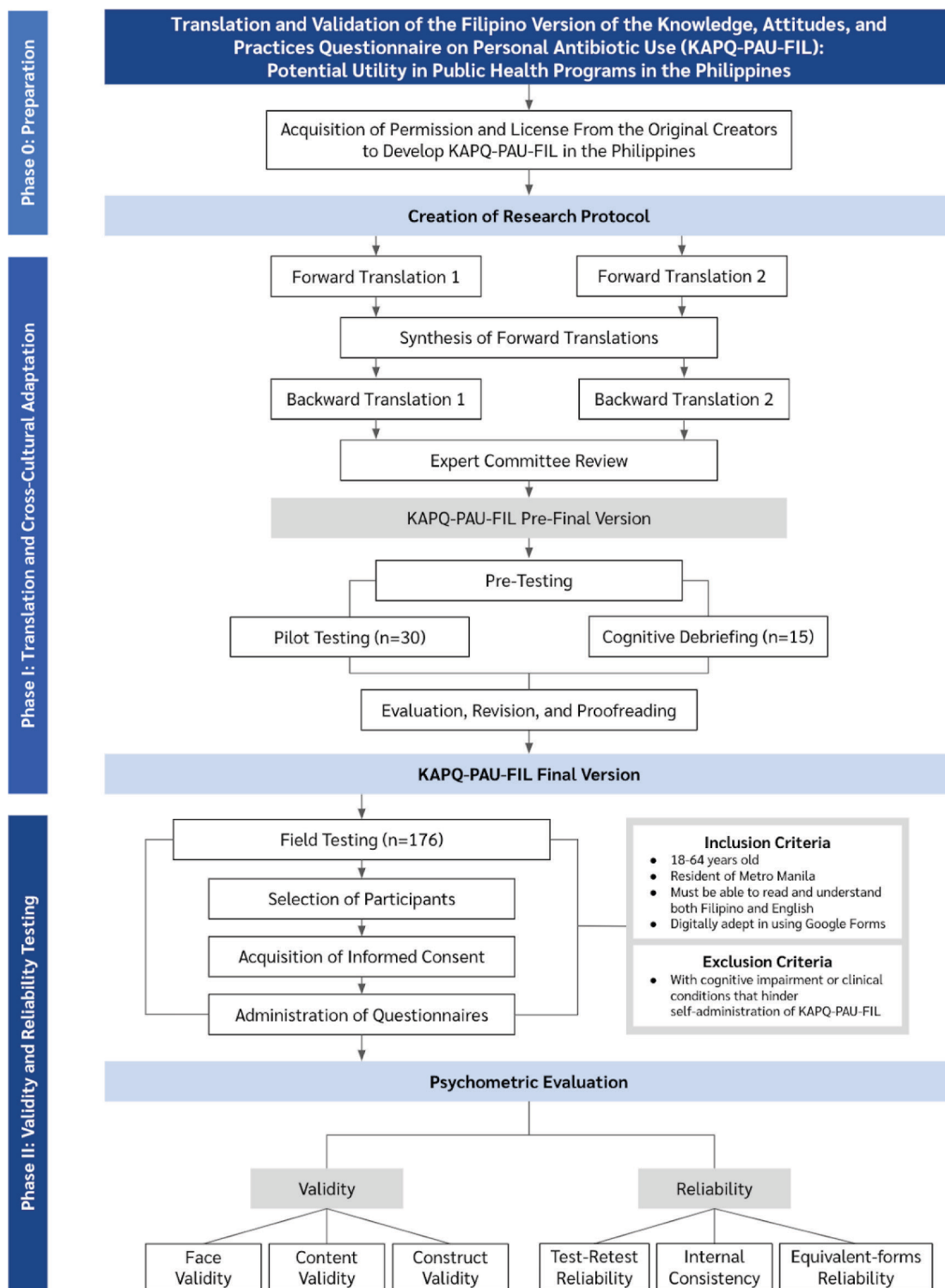


Figure 1: Research Design Diagram

of 0.80, while the criterion for accepting the S-FVI was set at a minimum of 0.83. To account for chance agreement, the modified kappa statistic was then calculated, with values above 0.74, between 0.60 and 0.74, and between 0.40 and 0.59 considered excellent, good and fair, respectively.[9]

For content validity, the researchers sent out the questionnaire to a panel of content experts who were

selected based on their academic qualifications and experience with prescribing antibiotics. This panel was asked to evaluate the relevance of each item in relation to the domain it intends to measure. In accordance with the minimum number of experts for content validation of six experts set by Yusoff,[8] a total of 10 experts were invited. Subsequently, the content experts were provided with a content

validation form and asked to assess the extent of relevance for each item pertaining to the targeted domain, employing a 4-point scale (1 = the item is not relevant to the measured domain; 2 = the item is somewhat relevant to the measured domain; 3 = the item is quite relevant to the measured domain; 4 = the item is highly relevant to the measured domain). Afterwards, the I-CVI (item-level content validity index) which pertains to the proportion of content experts giving an item a relevance rating of 3 of 4 and S-CVI (scale-level content validity index) which is the average of the I-CVI scores for all items were calculated. The criterion for accepting the I-CVI was set at a minimum of 0.78, while the criterion for accepting the S-CVI was set at a minimum of 0.80. Accordingly, items with I-CVI <0.80 were rejected, items with I-CVI \geq 0.80 but <1 were deliberated and revised if deemed necessary and items with I-CVI = 1.00 were accepted. The modified kappa statistic was also calculated to adjust for chance agreement with values above 0.74, between 0.60 and 0.74, and between 0.40 and 0.59 considered excellent, good and fair, respectively.[9]

For construct validity, data from field testing underwent confirmatory factor analysis (CFA). Goodness-of-fit testing was done by calculating the following statistics: comparative fit index (CFI, acceptable if \geq 0.90), root mean squared error approximation (RMSEA, acceptable if <0.08), standardized root mean square residual (SRMR, acceptable if <0.08), factor loadings (FL, acceptable if \geq 0.50), item-total correlations (ITC, acceptable if \geq 0.50) and gender-based differential item functioning (DIF, acceptable if $p >$ 0.05).

For test-retest reliability, each participant was sent an invitation email to participate in a follow-up survey precisely 14 days (2 weeks) after they had completed the initial survey. The intraclass correlation coefficient (ICC) was then calculated, with ICC \geq 0.75 considered acceptable.[10]

For internal consistency, the Cronbach's alpha of each item and subscale of the KAPQ-PAU-FIL was calculated. Cronbach's alpha values less than 0.5 are indicative of poor reliability, values between 0.5 and 0.70 indicate moderate reliability, values between 0.70 and 0.90 indicate high reliability, and values greater than 0.90 indicate excellent reliability.[11]

For equivalent forms reliability, both the English and Filipino version were administered to

participants. Comparative analysis was done using Wilcoxon signed-rank test due to the ordinal nature of items in the knowledge and attitudes section. In line with this, a significance level of 0.05 was used to interpret data. For the practices section which utilizes nominal data, Cohen's kappa coefficient was used to determine the level of agreement. Interpretation of kappa values followed established guidelines: values \leq 0 indicate no agreement; 0.01–0.20, slight agreement; 0.21–0.40, fair agreement; 0.41–0.60, moderate agreement; 0.61–0.80, substantial agreement; and 0.81–1.00, almost perfect agreement.

Ethical Considerations

This research was performed in accordance with the Declaration of Helsinki and the guidelines set by the Philippine Health Research Ethics Board (PHREB). Ethical approval was sought from the UST Faculty of Medicine and Surgery - Research Ethics Board (USTFMS-REB). Processing of personal information was also done in compliance with the Data Privacy Act of 2012.

RESULTS

Face Validity

Evaluation of face validity (Table 1) revealed I-FVI values ranging from 0.93 to 1.00 and all items with K $>$ 0.74, indicating that the translated items demonstrate a high level of clarity. As a result, all items are accepted and subjected to subsequent analyses. S-FVI/Ave exceeded the minimum acceptable level of 0.80, reaching a value of 0.99, thus demonstrating high face validity.

Content Validity

Assessment of content validity (Table 2) of the KAPQ-PAU-FIL revealed I-CVI values ranging from 0.90 to 1.00 and all items with K $>$ 0.74, indicating that the translated items were highly relevant to the measured domain. Therefore, all items were retained for subsequent analysis. The S-CVI/Ave reached 0.99, which was higher than the minimum acceptable level of 0.80, indicating high content validity.

Table 1: Face Validity Index (FVI)

Item	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	I-FVI	K	Interpretation
Q1	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q2	4	2	4	3	4	4	4	4	4	4	4	4	4	4	4	0.93	0.93	Accepted
Q3	4	3	4	4	4	4	4	4	4	4	4	3	4	4	4	1	1	Accepted
Q4	4	2	4	3	4	4	3	4	4	4	4	4	3	4	4	0.93	0.93	Accepted
Q5	4	2	4	3	4	4	4	4	4	4	4	4	4	4	4	0.93	0.93	Accepted
Q6	4	3	4	3	4	4	4	3	4	4	4	4	4	4	4	1	1	Accepted
Q7	4	3	4	4	3	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q8	4	3	4	4	4	4	4	4	4	4	4	3	4	4	4	1	1	Accepted
Q9	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q10	4	2	4	3	4	4	4	4	4	3	4	4	4	4	4	0.93	0.93	Accepted
Q11	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q12	4	4	4	4	4	3	4	4	4	3	4	4	4	4	4	1	1	Accepted
Q13	4	3	4	4	4	4	4	4	4	4	4	4	3	4	4	1	1	Accepted
Q14	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q15	3	3	4	4	4	3	4	4	4	4	4	4	4	4	3	1	1	Accepted
Q16	4	2	4	4	4	4	4	4	4	4	4	3	4	4	4	0.93	0.93	Accepted
Q17	4	3	4	4	4	4	3	4	4	4	4	4	4	4	4	1	1	Accepted
Q18	4	3	4	4	4	4	4	4	4	3	4	4	4	4	4	1	1	Accepted
Q19	4	4	4	4	4	3	4	4	4	3	4	4	4	4	4	1	1	Accepted
Q20	4	3	4	4	4	4	4	4	4	4	4	4	3	4	4	1	1	Accepted
Q21	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q22	3	3	4	4	4	3	4	4	4	4	4	3	4	4	3	1	1	Accepted
Q23	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q24	4	3	4	4	4	4	4	4	4	4	4	4	4	3	4	1	1	Accepted
Q25	4	3	4	4	4	4	3	4	4	4	4	4	4	4	4	1	1	Accepted
Q26	4	3	4	4	4	4	4	4	4	4	4	3	4	4	4	1	1	Accepted
Q27	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
S-FVI/Ave																0.99		Accepted

Abbreviations: R, Respondent; I-CVI, Item-Level Face Validity Index; S-FVI, Scale-Level Face Validity Index; K, Modified Kappa.

Table 2: Content Validity Index (CVI)

Item	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	I-CVI	K	Interpretation
Q1	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q2	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q3	4	3	4	4	4	3	4	3	4	3	1	1	Accepted
Q4	4	4	4	4	4	3	4	3	4	4	1	1	Accepted
Q5	4	4	4	4	4	4	4	3	4	4	1	1	Accepted
Q6	4	4	4	4	4	3	4	2	4	4	0.90	0.90	Accepted
Q7	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q8	3	4	3	4	4	4	4	4	4	4	1	1	Accepted
Q9	4	4	4	4	4	3	4	4	4	4	1	1	Accepted
Q10	4	4	4	4	4	3	4	4	4	4	1	1	Accepted
Q11	4	4	4	4	4	3	4	2	4	4	0.90	0.90	Accepted
Q12	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q13	4	4	3	4	4	4	4	3	4	4	1	1	Accepted
Q14	4	4	4	3	4	4	4	3	3	4	1	1	Accepted
Q15	4	4	4	4	4	3	4	3	4	3	1	1	Accepted
Q16	4	4	4	4	4	3	4	4	4	4	1	1	Accepted
Q17	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q18	4	4	4	4	4	3	4	2	4	4	0.90	0.90	Accepted
Q19	4	4	4	3	4	4	4	3	3	4	1	1	Accepted
Q20	4	4	4	4	4	3	4	3	4	3	1	1	Accepted
Q21	4	4	4	4	4	3	4	4	4	4	1	1	Accepted
Q22	4	4	4	4	4	4	4	4	4	4	1	1	Accepted
Q23	4	4	3	4	4	4	4	3	4	4	1	1	Accepted
Q24	4	4	4	3	4	4	4	3	3	4	1	1	Accepted
Q25	4	4	4	4	4	3	4	3	4	3	1	1	Accepted
Q26	4	4	4	4	4	3	4	4	4	4	1	1	Accepted
Q27	4	4	4	4	4	3	4	4	4	4	1	1	Accepted
S-CVI/Ave											0.99		Accepted

Abbreviations: E, Expert; I-CVI, Item-Level Content Validity Index; S-CVI, Scale-Level Content Validity Index; K, Modified Kappa.

Table 3: Confirmatory Factor Analysis (CFA)

Model	CFI	RMSEA	SRMR	FL	ITC	DIF
Acceptable Values	≥0.90	≤0.08	≤0.08	≥0.50	≥0.50	p>0.05
Index Values	0.92	0.06	0.04	0.60-0.85	0.58-0.71	p = 0.12

Abbreviations: CFI, Comparative Fit Index; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Square Residual; FL, Factor Loadings; ITC, Item-Total Correlations; DIF, Differential Item Functioning (Gender Bias)

Table 4: Test-Retest Reliability and Internal Consistency of the Knowledge and Attitudes Section

	Statement	ICC (95% CI)	Cronbach's α*
Q1	Ang mga antibiotic ay mabisa laban sa mga virus.	0.78 (0.70–0.85)	0.931
Q2	Kapag ako ay may sipon, umiinom ako ng antibiotics para mas...	0.80 (0.73–0.86)	0.935
Q3	Kung bumuti ang pakiramdam ko pagkatapos ng ilang araw, minsan...	0.82 (0.75–0.88)	0.934
Q4	Inaasahan kong magreseta ang aking doktor ng mga antibiotic...	0.79 (0.71–0.86)	0.933
Q5	Mainam na makakuha ng antibiotic sa mga kamag-anak o ...	0.84 (0.77–0.89)	0.936
Q6	Kapag sumasakit ang lalamunan ko, gusto kong uminom ng antibiotic.	0.81 (0.74–0.87)	0.935
Q7	Ang bawat uri ng impeksiyon ay nangangailangan ng iba-ibang...	0.78 (0.69–0.85)	0.931
Q8	Dapat kong ihinto ang pag-inom ng antibiotics kapag nakaramdam...	0.86 (0.79–0.90)	0.93
Q9	Iniinom ko ang mga antibiotic ayon sa mga tagubilin ng doktor.	0.80 (0.72–0.86)	0.927
Q10	Kung sobra ang pag-inom ng antibiotics, hindi ito tatalab kapag ito...	0.82 (0.75–0.88)	0.931
Q11	Mas gusto kong magtabi ng antibiotic sa bahay kung sakaling...	0.79 (0.71–0.85)	0.934
Q12	Pinagkakatiwalaan ko ang pasya ng doktor kung magbibigay siya...	0.85 (0.78–0.90)	0.928
Q13	Kung sa palagay ko na kailangan ko ng antibiotic at hindi ito nireseta...	0.83 (0.76–0.89)	0.936
Q14	Madalas na malinaw na ipinapaliwanag ng mga doktor sa pasyente...	0.87 (0.80–0.91)	0.928
Q15	Madalas na malinaw na ipinapaliwanag ng mga doktor sa pasyente...	0.88 (0.82–0.92)	0.927
Q16	Kapag bumibili ka ng antibiotics, ipinaliliwanag sa iyo ng...	0.84 (0.77–0.89)	0.932
S1	Knowledge	0.82 (0.75–0.88)	0.928
S2	Attitudes	0.85 (0.79–0.90)	0.935

* Cronbach's α for Q1-Q16 = if item deleted; for S1-S2 = overall alpha.

Construct Validity

CFA results of the KAPQ-PAU-FIL (Table 3) confirm that the scale structure aligns well with the intended theoretical model as evidenced by strong fit indices (CFI = 0.92, RMSEA = 0.06, SRMR = 0.04). This suggests that the questionnaire effectively captures the theoretical dimensions of KAP as intended. All factor loadings (0.60 - 0.85) and item-total correlations (0.58 - 0.71) meet standards. The absence of gender bias (p = 0.12) confirms that the items function uniformly across groups, further supporting the scale's fairness.

Test-Retest Reliability

All items under the knowledge and attitudes section of the KAPQ-PAU-FIL demonstrated good test-retest reliability, with ICC values ranging from 0.78 to 0.88

and an overall ICC of 0.82 for the knowledge subscale and 0.85 for the practices subscale (Table 4). These values exceed the commonly accepted threshold of 0.75 for good reliability, indicating that the items consistently produce stable and reproducible results across repeated measurements.

Internal Consistency

Cronbach's alpha values for all items under the knowledge and attitudes section of the KAPQ-PAU-FIL range from 0.927 to 0.936 (Table 4), which is well above the ≥0.70 threshold for good internal consistency. Specifically, the knowledge subscale shows a Cronbach's alpha of 0.928, while the attitudes subscale has a Cronbach's alpha of 0.935. No item notably reduces the scale's reliability, as alpha values remain stable when items are

Table 5: Wilcoxon Signed-Rank Test Scores of the Knowledge and Attitudes Section

Item	KAPQ-PAU-ENG	KAPQ-PAU-FIL	Z-Value	p-Value
	Mean \pm SD	Mean \pm SD		
Q1	4.6 \pm 3.2	4.7 \pm 3.1	-0.56	0.574
Q2	2.3 \pm 2.4	2.4 \pm 2.3	-0.28	0.780
Q3	2.4 \pm 2.6	2.5 \pm 2.5	-0.65	0.516
Q4	3.0 \pm 3.1	2.8 \pm 3.0	-0.91	0.362
Q5	1.4 \pm 1.8	1.2 \pm 1.7	-1.08	0.280
Q6	2.1 \pm 2.5	1.8 \pm 2.3	-1.03	0.302
Q7	5.5 \pm 3.4	5.1 \pm 3.5	-1.22	0.223
Q8	4.8 \pm 3.2	4.8 \pm 3.1	-0.09	0.928
Q9	6.4 \pm 3.5	6.4 \pm 3.4	-0.12	0.905
Q10	4.5 \pm 3.3	4.4 \pm 3.2	-0.43	0.666
Q11	3.1 \pm 2.7	3.3 \pm 2.9	-0.81	0.418
Q12	6.4 \pm 3.6	6.2 \pm 3.7	-0.61	0.541
Q13	1.7 \pm 2.0	1.6 \pm 1.9	-0.49	0.626
Q14	6.0 \pm 3.5	6.0 \pm 3.4	-0.22	0.823
Q15	6.1 \pm 3.6	6.2 \pm 3.3	-0.30	0.763
Q16	5.1 \pm 3.2	5.3 \pm 3.4	-0.58	0.562

Table 6: Cohen's Kappa Coefficients of the Practices Section

Item	Cohen's Kappa	Strength of Agreement
Q17	0.62	Good
Q18	0.64	Good
Q19	0.66	Good
Q20	0.68	Good
Q21	0.70	Good
Q22	0.65	Good
Q23	0.67	Good
Q24	0.71	Good
Q25	0.74	Good
Q26	0.72	Good
Q27	0.69	Good

individually removed. The results imply that the scale is highly cohesive, with all items consistently measuring the same underlying construct.

Equivalent forms Reliability

For the knowledge and attitudes section of the KAPQ-PAU-FIL, Wilcoxon signed-rank test showed no significant differences for any of the items with $p > 0.05$ (Table 5), indicating that participants' responses were consistent regardless of the version

administered. On the other hand, Cohen's kappa analysis for the practices section of the KAPQ-PAU-FIL reveals values ranging from 0.62 to 0.74 (Table 6), indicating good strength of agreement between the two versions. This suggests substantial consistency between the English and Filipino versions of the assessment, with both forms effectively measuring the same constructs.

DISCUSSION

To the best of the researchers' knowledge, the KAPQ-PAU-FIL is the first-ever Filipino-translated, culturally adapted and psychometrically validated questionnaire that can be used for evaluation of the adult Filipino population's KAP on personal antibiotic use. Following initial development of the original KAPQ-PAU by Mallah, et al., [4] the questionnaire has since been translated and adapted into Spanish, Arabic, French and now, the Filipino language.

The development of the KAPQ-PAU-FIL adhered closely to established best practices in instrument translation and cross-cultural adaptation to ensure linguistic equivalence and contextual relevance. Forward and back translation methods done by language experts, combined with expert committee reviews and pre-testing via pilot testing and cognitive debriefing contributed significantly to the

KAPQ-PAU-FIL's robust psychometric properties. The methodologies employed by researchers were vital in ensuring that translated items in the questionnaires not only retain the original questionnaire's meaning but also incorporate culturally appropriate terminology and phrasing.

Based on the expert committee review and additional discussions after pilot testing and cognitive debriefing which focused on overall ease of understanding and interpretation of content, most of the items did not require extensive deliberation, as the original English content was largely comparable and culturally appropriate when translated into Filipino. However, four items (Q2, Q4, Q18 and Q26) prompted further discussion to ensure a more accurate and culturally relevant translation.

Item Q2 ("When I get a cold, I take antibiotics to help me feel better faster.") was initially directly translated as "Kapag ako ay may sipon, umiinom ako ng antibiotics para mas mabilis akong gumaling." This version was revised because the expert committee noted that the tone and phrasing did not align naturally with how Filipinos typically express everyday health experiences. Rather than saying "para mas mabilis akong gumaling," Filipinos would be more likely to say "mas bumuti ang pakiramdam ko." This distinction was important because the item was designed to reflect an individual's knowledge or rationale regarding the use or misuse of antibiotics when experiencing a common cold. In the Filipino context, it was important to recognize that health-related decisions are often based on personal experience.[12] The revised wording better captures this cultural nuance, as people commonly assess the effectiveness of medicine based on how it affects their *pakiramdam* (feeling or sense of well-being), rather than on whether objective clinical recovery occurs.

Revision was also done for item Q4 ("I expect my doctor to prescribe antibiotics if I suffer from common cold or flu symptoms.") which was initially translated to "Inaasahan kong magresetang aking doktor ng mga antibiotic kung makaranas ako ng mga sintomas ng karaniwang sipon o trangkaso." Though linguistically accurate, it was considered as sounding too medical and less typical of everyday Filipino speech. Hence, this item was revised to "Inaasahan kong magresetang aking doktor ng mga antibiotic kung magkasipon ako o makaranas ng mga sintomas ng trangkaso." By using more

conversational and culturally familiar phrasing, the final version better reflects how a Filipino respondent would realistically interpret and respond to the item. Item Q18 ("How long was the duration of your last treatment with antibiotics?") was similarly revised for improved clarity and naturalness. The phrase "huling paggamot ng antibiotics" was revised to "huli mong gamutan", which is more familiar, fluid and commonly used in everyday conversations, thus better reflecting how treatment experiences are typically described in the local context.

On the other hand, one of the response choices in item Q26 posed a challenge in translating the phrase "very sick" into Filipino. The initial translation — "sobrang sakit" — while technically correct and commonly used in the vernacular (eg, *sobrang sakit ng ulo, sobrang sakit ng tiyan*), tends to limit the interpretation to physical pain and fails to capture the intended meaning of the original phrase which is a general sense of unwellness that may not be limited to pain alone. To better reflect this nuance, the phrase was revised to "sobrang sama ng pakiramdam." This alternative uses the word *pakiramdam*, a more flexible and familiar term that encompasses both physical and emotional states, making it more appropriate for conveying the complex and often ambiguous nature of illness in everyday Filipino language. In line with this, Jamindang [13] pointed out that expressing complex bodily experiences in Filipino requires moving beyond literal equivalence toward language that resonates with how such states are felt and articulated in local contexts.

This careful attention to linguistic nuance and cultural appropriateness reflects the overall methodological soundness of the translation process, which ultimately contributed to the strong psychometric performance of the adapted questionnaire. As a result, the questionnaire exhibited high face, content and construct validity, generated reproducible results, revealed high internal consistency and good agreement with the original version of the questionnaire.

With its psychometric strengths, the KAPQ-PAU-FIL holds substantial benefits for public health efforts in the Philippines concerning antibiotic use. Antibiotic misuse and antibiotic resistance continue to be a critical health challenge globally, with this issue potentially being more acute and heightened in the Philippines due to widespread low health literacy.[14] Through the KAPQ-PAU-FIL, health

policymakers and researchers can now effectively measure and monitor public KAP related to antibiotic use. Information obtained from this validated, locally translated and culturally tailored instrument is crucial in the design and implementation of effective, evidence-based interventions that would be able to target health misinformation. This, in turn, would encourage appropriate antibiotic use and ultimately lead to decreased rates of antibiotic misuse and resistance.

The potential benefits of the KAPQ-PAU-FIL is not only limited to the Philippines, but ripples into the broader field of global health as well. The success of this translation and validation project can serve as a framework for the development of other health behavior instruments that are better suited in low- and middle-income countries (LMICs). Indeed, this research contributes to ongoing efforts to decolonize research practices by highlighting the need for locally relevant, context-sensitive tools in health research which is grounded in the lived realities of different communities around the globe.[15]

Similar to the previously translated versions of the KAPQ-PAU, the study has an inherent limitation which can be attributed to the absence of a gold standard (ie, a superior instrument or a biologic factor to which the performance could be compared). Therefore, the KAPQ-PAU-FIL's concurrent validity, which measures how well the translated questionnaire compares to a gold standard, cannot be tested. Additionally, the content validity in this study was assessed solely by a panel of experts, which may not capture the views of the wider population.

CONCLUSION

To date, the KAPQ-PAU-FIL is the first-ever, Filipino-translated and culturally adapted KAP questionnaire on personal antibiotic use. The developed questionnaire demonstrated good validity and reliability, establishing it as a practical and relevant

tool for assessing the Filipino adult population's KAP on personal antibiotic use. Henceforth, the KAPQ-PAU-FIL stands as a significant advancement in public health research and health intervention planning in the Philippines. This underscores its relevance for evaluating individual behavior, informing community-based interventions and supporting policies that address antibiotic misuse and the broader challenge of antibiotic resistance.

Further studies should focus on the actual assessment of adult Filipinos' KAP on personal antibiotic use using the KAPQ-PAU-FIL. Its applicability across population subgroups, including but not limited to, indigenous communities, persons deprived of liberty (PDLs) and those living in geographically isolated and disadvantaged areas (GIDAs) can also be evaluated. Lastly, longitudinal studies are suggested to assess the tool's sensitivity to changes in KAP over time, especially in the context of prospective public health campaigns and policy shifts.

Disclosure and conflict of interest

The researchers openly and transparently affirm that they have absolutely no conflicts of interest, be it financial, familial, or proprietary, with any of the participants, validators, or the study being conducted. This study is conducted with utmost integrity and impartiality, adhering to the highest standards of scientific rigor and transparency.

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