

ORIGINAL ARTICLE

Development and Validation of a Questionnaire on Knowledge, Attitude and Practice Regarding Occupational Safety and Health (Q-TRIMOSH-KAP) Among Food Industry Workers in Selangor, Malaysia

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ABSTRACT

Introduction: Food industry is a key contributor to Malaysia's Gross Domestic Product (GDP), spanning food processing, distribution, and services. Assessing their knowledge, attitude, and practice (KAP) regarding occupational safety and health (OSH) is crucial. Although KAP scores are widely used, there's no specific questionnaire for food industry workers. This study aims to develop and validate OSH related KAP questionnaire for food industry workers.

Materials and methods: A questionnaire specifically designed to assess knowledge, attitude, and practice (KAP) regarding occupational safety and health (OSH) among food industry workers in Selangor, Malaysia, was developed and underwent review by six subject matter experts. The self-administered questionnaire utilized closed-ended questions with combination of yes and false response for knowledge and Likert scale for other latent variables. Item-Content Validity Index (I-CVI), Content Validity Ratio (CVR) and Cronbach's alpha analysis was used to evaluate the validation and reliability of the questionnaire. **Results:** All items in final version achieved a Content Validity Index (CVI) surpassing the minimum requirement. Additionally, the Content Validity Ratio (CVR) analysis revealed unanimous agreement among experts. Cronbach's alpha values improved from initial to final versions: Knowledge (0.705 to 0.716), Attitude (0.743 to 0.788), and Practice (0.770 to 0.813). Notably, the final version achieved satisfactory internal consistency (Cronbach's alpha coefficients > 0.7). **Conclusion:** The pilot study confirms the questionnaire's effectiveness in assessing occupational safety and health among food industry workers. Rigorous validation and expert input strengthen the study's credibility, paving the way for future research and improved safety measures in the food industry in Selangor, Malaysia.

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INTRODUCTION

Food industry workers are defined as individuals who are directly involved in food preparation, come into contact with food or food contact surfaces, and handle packaged or unpackaged food, or appliances, on any

food premises [1]. The food industry significantly contributes to Malaysia's Gross Domestic Product (GDP) and encompasses various sectors including food processing, distribution, and services. This industry is pivotal to Malaysia's economy and is expected to experience further growth [2]. In Selangor, Malaysia, the food industry employs a substantial workforce, contributing significantly to the state's economic landscape [3]. In a long time, food industry workers have been identified to face unique challenges including exposure to hazardous substances, ergonomic risks, and

workplace accidents [4]. The rapid expansion of this industry raises concerns about the safety and health of its workers, particularly in terms of occupational safety and health (OSH) [5]. Supported by the recent findings, occupational hazards among the food industry workers are in need of a comprehensive assessment tool to measure OSH standard.

Assessment on knowledge, attitude, and practice (KAP) score has been observed to be used as a mean to measure certain standard of targeted population in various fields, such as healthcare, education, social sciences as well as occupational safety and health [6-9]. Based on the adaptable nature of the KAP-based questionnaire in measuring its elements, questionnaire that based on KAP can provide valuable insights into the level of knowledge, attitudes, and practices regarding occupational safety and health standards among food industry workers [10]. For instance, evaluating knowledge helps to pinpoint areas of incomplete understanding, which in turn allows for focused training to improve hazard awareness and risk management [11]. Comprehending attitudes promotes a favorable safety culture that supports adherence to safety protocols, reporting of hazards, and adoption of safe work practices [12]. Assessing practice reveals inconsistencies and provides opportunities for corrective actions to align conduct with established safety regulations [13].

Currently, there is no existing questionnaires that able to adequately capture the nuances of OSH concerns in the KAP context on food industry workers. Thus, the development of a validated questionnaire specific to the food industry workers through statistical analyses, including factor analysis and reliability testing, the questionnaire's psychometric properties is imperative to accurately assess the KAP of workers regarding OSH. This validation process will establish the questionnaire's ability to measure OSH knowledge, attitude, and practices consistently and accurately among food industry workers, reinforcing the credibility and robustness of the subsequent research findings. The development of a comprehensive questionnaire is essential to accurately capture the diverse aspects of OSH relevant to the food industry. By understanding workers' perceptions and behaviors, targeted interventions can be developed to mitigate risks and promote a safer working environment [14].

The development of the questionnaire is significant not only for its implications on the safety and well-being of food industry workers but also for the broader societal benefits it may yield. Improved OSH knowledge, attitude and practices can lead to reduced workplace injuries and illnesses, enhanced productivity, and lower healthcare costs in treating preventable occupational injuries and illnesses among food industry workers [15]. Furthermore, by promoting a culture of safety in the food industry, this study aligns with Malaysia's commitment to

achieving the United Nations Sustainable Development Goals, particularly Goal 8 on decent work and economic growth, and Goal 3 on good health and well-being [16]. The completed questionnaire (Q-TRIMOSH-KAP) then can also be used to measure the effectiveness of the Theory-Based Intervention Module on Occupational Safety and Health at Food Premise (TRIMOSH) in Improving Knowledge, Attitude and Practice Among Food Industry Workers In Selangor, Malaysia as per desired in the study protocol [17]. Although KAP scores are widely used, there's no specific questionnaire for food industry workers. Thus, this study aims to develop and validate OSH related KAP questionnaire for food industry workers.

MATERIALS AND METHODS

The validation process began with assessing face validity among study population to review the questionnaire items for the clarity and relevance. This was followed by a content validity assessment conducted by a panel of subject matter experts, who evaluated each item using a four-point scale to calculate the Item-Content Validity Index (I-CVI). Additionally, the Content Validity Ratio (CVR) was computed to determine the necessity of each item, with higher CVR scores indicating greater expert consensus. Finally, reliability analysis using Cronbach's alpha was performed to assess internal consistency, aiming for alpha values between 0.70 and 0.90 to ensure adequate item correlation without redundancy.

Study Population

This pilot study aims to survey 30 food industry workers aged between 19 and 65 in Selangor, Malaysia, from 15 January 2024 to 15 April 2024. Sample size of 30 subjects is typically considered adequate to perform reliability and validity testing, such as calculating Cronbach's alpha for internal consistency and conducting item analysis to refine the questionnaire before larger-scale deployment. Participation is voluntary, and consented from all participants. The inclusion criteria for this study were as follows: i) food industry workers of all positions, including in-house delivery and dispatch workers, ii) citizens and non-citizens, and iii) workers of all types of restaurants and beverage shops. The exclusion criteria were as follows: i) food industry workers who have not given their consent to participate, and ii) workers who were part of the third-party delivery apps, such as Grab and Foodpanda. The survey seeks to assess knowledge, attitude, and practice regarding occupational safety and health among food industry workers in Selangor. This approach ensures a comprehensive understanding of KAP, fostering a safer and healthier workplace environment.

Questionnaire

This study employed a self-administered questionnaire in the Malay language, utilizing Google Form format. The questionnaire, an instrument developed based

on available international and local OSH guidelines, focused on occupational safety and health within the food industry, incorporating components of Knowledge, Attitude, and Practice (KAP) [18-24]. It was structured into four parts. Part 1 encompassed sociodemographic data, including age, gender, ethnicity, education level, employment status, income, working experience, and participation in occupational safety and health training. Part 2 addressed knowledge regarding occupational safety and health. Part 3 focused on attitudes toward occupational safety and health, while Part 4 investigated practices related to occupational safety and health.

Face Validity

Assessors for face validity consisted of members of the public who met the survey's inclusion criteria, contrasting with experts in the relevant field, unlike expert evaluations for content validity. The main goal of face validity was to ascertain if the questionnaire items were clearly and effectively articulated, preventing participant confusion caused by excessive formality or vagueness [25]. All ten participants involved in the face validity evaluation met the eligibility requirements for the formal study's target population. Face validity evaluations were performed in person, with each participant personally invited to review survey questions and provide feedback on face validity.

Content Validity Index

The principal objective of the content validity assessment was to ascertain the extent to which the questionnaire items accurately reflected the conceptual framework under investigation. This evaluative procedure was conducted by a panel of expert reviewers who assessed each questionnaire item using a four-point scale (1 = Not relevant, 2 = Item needs some revision, 3 = Relevant but needs minor revision, 4 = Very relevant). The Item-Content Validity Index (I-CVI) was employed to evaluate the validity of individual items. The questionnaire underwent review and discussion with six subject matter experts, comprising one public health physician, two food technologists, one occupational safety and health trainer, one behavioral research expert, and one Malay native language expert. During the review process, experts were encouraged to provide feedback on questionnaire items and propose modifications as necessary. For an item to be accepted, both the overall CVI and itemized CVI needed to exceed 0.83 (six experts), while items with an itemized CVI of 0.83 or less were excluded from the respective construct [26-27].

Content Validation Ratio

The content validity ratio (CVR) proposed by Lawshe (1975) represented a linear transformation of the proportion of agreement among panel experts on the essentiality of questionnaire items [28]. This measure was utilized to evaluate the necessity of items in the questionnaire and yielded values ranging from -1 to +1.

Experts assigned ratings to each item using a four-point scale: 1 = not necessary, 2 = useful but not essential, 3 = essential, and 4 = very essential. The CVR was computed by dividing the discrepancy between the number of panelists designating an item as "essential" (ratings 3 and 4) and half the total number of panelists, by half the total number of panelists ($CVR = (ne - N/2) / (N/2)$). A higher CVR score indicated a higher level of consensus among expert panelists regarding the importance of the items [29].

Reliability Analysis

Cronbach's alpha, introduced by Lee Cronbach in 1951, served to assess the internal consistency of a test or scale, expressed as a coefficient ranging from 0 to 1 [30]. The magnitude of Cronbach's alpha was influenced by factors such as the number of test items, item correlations, and dimensionality [31]. Commonly cited acceptable alpha values in research studies fell within the range of 0.70 to 0.90 [32]. Alpha values below this range may signify inadequate correlation among internal items, whereas excessively high values may imply redundancy or duplication of certain items [33].

Statistical Analysis

A pilot study constituted a crucial component in the development and validation of a questionnaire, serving to refine its design and assess its validity [34]. In this study, data collection employed online platforms via Google Form, with the complete dataset subsequently transferred to statistical software SPSS 29.0 for analysis. Given the research objectives, the focus of the pilot study analysis was confined to evaluating content validity and reliability, with no additional descriptive analyses conducted.

Ethics Approval and Confidentiality

The study protocol, along with all its associated procedures, has obtained approval from the Ethics Committee for Research Involving Human Subjects of Universiti Putra Malaysia (JKEUPM-2022-346). Participants received explicit notification that their enrollment will not impact their relationship with their employer. Consent was obtained from each participant using an online consent form, following their verbal agreement to participate in this study before administering the questionnaire. No minors were involved in this study and participants were allowed to withdraw at any point without any penalty. To ensure confidentiality, all data collected were anonymized, and any identifying information was removed before analysis. The data were securely stored and accessible only to authorized personnel involved in the study.

RESULTS

Face Validity

Based on the preliminary assessment involving ten randomly selected food industry workers from a training

institution in Selangor, feedback on the face validity of the questionnaire was systematically evaluated. The results revealed that there was no uncertainty in the understanding of the questionnaire content among the ten respondents who participated. The duration to complete the questionnaire ranged from 10 to 15 minutes. Additionally, based on respondent feedback, appropriate modifications were made to the questionnaire to ensure clarity and comprehensibility.

Content Validity Index

The Content Validity Index (CVI) analysis demonstrated that all items met the minimum standard requirement for content validity of > 0.80 as outlined in Table I, indicating unanimous agreement among six expert reviewers on their relevance to the measured domain. Thus, all items related to knowledge (15 items), attitude (15 items), and practice (15 items) regarding occupational safety and health (OSH) among food industry workers in Selangor, Malaysia, were deemed appropriate based on expert assessment. Notably, no items were rated as not relevant, further affirming the questionnaire's robustness in capturing essential aspects of OSH in the food industry. These findings underscore the initial Q-TRIMOSH-KAP questionnaire's satisfactory level of content validity, essential for ensuring its effectiveness in assessing OSH-related knowledge, attitude, and practices among food industry workers.

Table I: The CVI of all the items (items = 45)

Scale	Items Code (Table V)	Relevant	Not relevant	CVIs	Interpretation
Knowledge on OSH	KOSH_1	6	0	1.00	Appropriate
	KOSH_2	6	0	1.00	Appropriate
	KOSH_3	6	0	1.00	Appropriate
	KOSH_4	6	0	1.00	Appropriate
	KOSH_5	6	0	1.00	Appropriate
	KOSH_6	6	0	1.00	Appropriate
	KOSH_7	6	0	1.00	Appropriate
	KOSH_8	6	0	1.00	Appropriate
	KOSH_9	5	1	0.83	Appropriate
	KOSH_10	6	0	1.00	Appropriate
	KOSH_11	6	0	1.00	Appropriate
	KOSH_12	6	0	1.00	Appropriate
	KOSH_13	6	0	1.00	Appropriate
	KOSH_14	6	0	1.00	Appropriate
	KOSH_15	6	0	1.00	Appropriate
Attitude on OSH	AOSH_1	6	0	1.00	Appropriate
	AOSH_2	6	0	1.00	Appropriate
	AOSH_3	6	0	1.00	Appropriate
	AOSH_4	6	0	1.00	Appropriate
	AOSH_5	6	0	1.00	Appropriate
	AOSH_6	6	0	1.00	Appropriate
	AOSH_7	5	1	0.83	Appropriate
	AOSH_8	5	1	0.83	Appropriate
	AOSH_9	6	0	1.00	Appropriate
	AOSH_10	6	0	1.00	Appropriate
	AOSH_11	6	0	1.00	Appropriate
	AOSH_12	6	0	1.00	Appropriate
	AOSH_13	6	0	1.00	Appropriate

CONTINUE

Table I: The CVI of all the items (items = 45). (CONT.)

Scale	Items Code (Table V)	Relevant	Not relevant	CVIs	Interpretation
Attitude on OSH	AOSH_14	6	0	1.00	Appropriate
	AOSH_15	6	0	1.00	Appropriate
	POSH_1	6	0	1.00	Appropriate
	POSH_2	6	0	1.00	Appropriate
	POSH_3	6	0	1.00	Appropriate
	POSH_4	6	0	1.00	Appropriate
	POSH_5	6	0	1.00	Appropriate
Practice on OSH	POSH_6	6	0	1.00	Appropriate
	POSH_7	6	0	1.00	Appropriate
	POSH_8	6	0	1.00	Appropriate
	POSH_9	6	0	1.00	Appropriate
	POSH_10	6	0	1.00	Appropriate
	POSH_11	6	0	1.00	Appropriate
	POSH_12	5	1	0.83	Appropriate
	POSH_13	5	1	0.83	Appropriate
	POSH_14	6	0	1.00	Appropriate
	POSH_15	6	0	1.00	Appropriate

Content Validation Ratio

The evaluation, conducted by six panel experts, ensured adherence to the minimum acceptable CVR value of > 0.45 [35]. The Content Validity Ratio (CVR) analysis revealed that all items met the minimum standard requirement for content validity, as outlined in Table II. Notably, out of the total 45 items analyzed, the majority were deemed appropriate based on expert assessment. However, items labeled as inappropriate, including KOSH_4a, KOSH_5a, AOSH_3a, AOSH_5a, AOSH_7a, AOSH_12a, POSH_9a, POSH_12a, and POSH_13a, scored below the acceptable threshold and were consequently removed from further consideration. These findings underscore the 1st revision Q-TRIMOSH-KAP questionnaire's satisfactory level of content validity, essential for ensuring its effectiveness in assessing OSH-related knowledge, attitude, and practices among food industry workers.

Table II: The CVR of all the items (items = 45)

Scale	Items Code (Table V)	Essential SME	Not Essential SME	CVRs	Interpretation
Knowledge on OSH	KOSH_1	6	0	1.00	Appropriate
	KOSH_2	6	0	1.00	Appropriate
	KOSH_3	6	0	1.00	Appropriate
	KOSH_4 ^a	3	3	0.00	Inappropriate
	KOSH_5 ^a	4	2	0.33	Inappropriate
	KOSH_6	6	0	1.00	Appropriate
	KOSH_7	6	0	1.00	Appropriate
	KOSH_8	6	0	1.00	Appropriate
	KOSH_9 ^a	3	3	0.00	Inappropriate
	KOSH_10	6	0	1.00	Appropriate
	KOSH_11	6	0	1.00	Appropriate
	KOSH_12	6	0	1.00	Appropriate
	KOSH_13	6	0	1.00	Appropriate

CONTINUE

Table II: The CVR of all the items (items = 45). (CONT.)

Scale	Items Code (Table V)	Essential SME	Not Essential SME	CVRs	Interpretation
Knowledge on OSH	KOSH_14	6	0	1.00	Appropriate
	KOSH_15	6	0	1.00	Appropriate
	AOSH_1	6	0	1.00	Appropriate
	AOSH_2	6	0	1.00	Appropriate
	AOSH_3 ^a	4	2	0.33	Inappropriate
	AOSH_4	6	0	1.00	Appropriate
	AOSH_5 ^a	3	3	0.00	Inappropriate
	AOSH_6	6	0	1.00	Appropriate
	AOSH_7 ^a	3	3	0.00	Inappropriate
	AOSH_8	5	1	0.67	Appropriate
	AOSH_9	6	0	1.00	Appropriate
	AOSH_10	6	0	1.00	Appropriate
	AOSH_11	6	0	1.00	Appropriate
	AOSH_12	6	0	1.00	Appropriate
	AOSH_13	6	0	1.00	Appropriate
Attitude on OSH	AOSH_14	6	0	1.00	Appropriate
	AOSH_15	6	0	1.00	Appropriate
	POSH_1	6	0	1.00	Appropriate
	POSH_2	6	0	1.00	Appropriate
	POSH_3	6	0	1.00	Appropriate
	POSH_4	6	0	1.00	Appropriate
	POSH_5	6	0	1.00	Appropriate
	POSH_6	6	0	1.00	Appropriate
	POSH_7	6	0	1.00	Appropriate
	POSH_8	6	0	1.00	Appropriate
	POSH_9 ^a	3	3	0.00	Inappropriate
	POSH_10	6	0	1.00	Appropriate
	POSH_11	6	0	1.00	Appropriate
	POSH_12 ^a	4	2	0.33	Inappropriate
	POSH_13 ^a	4	2	0.33	Inappropriate
Practice on OSH	POSH_14	6	0	1.00	Appropriate
	POSH_15	6	0	1.00	Appropriate

a: Items deleted

Reliability of the Questionnaire

The 1st revision and final version Q-TRIMOSH-KAP Cronbach's alpha values for Knowledge, Attitude, and Practice on OSH are presented in Table III. Items were meticulously reviewed and revised based on Cronbach's alpha values and recommendations from subject matter experts, as depicted in Table IV. For the Knowledge component, the initial Cronbach's alpha value was 0.705, which improved to 0.716 after deletion of items KOSH_11a and KOSH_13a. In the Attitude component, the initial Cronbach's alpha value was 0.743, increasing to 0.788 post-revision after deletion of items AOSH_11a and AOSH_15a and modification of items AOSH_15b and AOSH_13b. Similarly, for the Practice component, the initial Cronbach's alpha value was 0.770, increasing to 0.813 after deletion of items POSH_7a and POSH_8a. The results indicate that the internal consistency and reliability of the final version of Q-TRIMOSH-KAP were satisfactory (Cronbach's alpha coefficients > 0.7)

compared to the 1st revision of questionnaire. This approach resulted in enhanced reliability, ensuring that the questionnaire effectively measures knowledge, attitude, and practices regarding occupational safety and health among food industry workers in Selangor, Malaysia.

Table III: Reliability Statistics

	1 st revision Q-TRI-MOSH-KAP (Before deletion and modification)		Final Q-TRI-MOSH-KAP (After deletion and modification)	
	Cronbach's alpha	Items	Cronbach's alpha	Items
Knowledge on OSH	0.705	12	0.716	10
Attitude on OSH	0.743	12	0.788	10
Practice on OSH	0.770	12	0.813	10
Total items		36		30

Table IV: Reliability Analysis, Item-Total Correlation, and Variability of Cronbach's Alpha If One Item Was Deleted Based on Each Dimension (items 36).

Item Code (Table V)	Scale Mean If Item Deleted	Scale Variance If Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted
Knowledge on OSH [0.705 (12)]				
KOSH_1	18.60	12.455	.644	.636
KOSH_2	18.33	16.299	.056	.711
KOSH_3	18.60	12.455	.644	.636
KOSH_6	18.83	12.420	.514	.655
KOSH_7	18.77	13.151	.414	.674
KOSH_8	18.67	12.506	.575	.645
KOSH_10	18.87	13.430	.319	.693
KOSH_11	18.60	15.076	.141	.716
KOSH_12	18.47	15.085	.215	.702
KOSH_13	18.67	14.782	.186	.710
KOSH_14	18.27	16.478	.000	.711
KOSH_15	18.27	16.478	.000	.711
Attitude on OSH [0.743 (12)]				
AOSH_1	47.57	21.495	.643	.699
AOSH_2	47.60	22.386	.702	.705
AOSH_4	48.70	22.493	.222	.753
AOSH_6	47.53	21.913	.574	.706
AOSH_8	47.53	22.326	.628	.707
AOSH_9	47.33	23.402	.585	.719
AOSH_10 ^b	47.33	23.195	.638	.715
AOSH_11 ^a	47.87	24.326	.023	.789
AOSH_12	47.63	21.068	.449	.716
AOSH_13 ^b	47.53	23.913	.377	.730
AOSH_14	49.20	17.200	.493	.725
AOSH_15 ^a	47.27	24.823	.280	.739
Practice on OSH [0.770 (12)]				
POSH_1	45.83	38.626	.406	.755
POSH_2	44.60	39.145	.735	.732
POSH_3	45.33	38.644	.333	.768
POSH_4	44.67	38.851	.673	.733
POSH_5	44.73	38.064	.524	.741

CONTINUE

Table IV: Reliability Analysis, Item-Total Correlation, and Variability of Cronbach's Alpha If One Item Was Deleted Based on Each Dimension (items 36). (CONT.)

Item Code (Table V)	Scale Mean If Item Deleted	Scale Vari- ance If Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted
Practice on OSH [0.770 (12)]				
POSH_6	44.83	43.454	.203	.772
POSH_7 ^a	46.10	47.472	-.151	.809
POSH_8 ^a	44.80	38.097	.526	.741
POSH_10	45.17	36.833	.485	.745
POSH_11	44.80	36.028	.725	.718
POSH_14	44.90	40.438	.352	.760
POSH_15	44.70	41.941	.334	.762

a: Items deleted, b: Items modification

DISCUSSION

The absence of reported uncertainties among the ten randomly selected food industry workers suggests a high level of understanding of the questionnaire content. The choice of 10 respondents was likely pragmatic, considering factors such as time, budget, and feasibility. Despite the small sample size, these respondents offer valuable perspectives that can inform iterative improvements to the questionnaire. Additionally, the use of a qualitative approach in this phase allows for in-depth exploration of respondent feedback, facilitating nuanced adjustments to enhance the questionnaire's effectiveness.

The Content Validity Index (CVI) analysis confirms the questionnaire's robustness in assessing occupational safety and health (OSH) among food industry workers in Selangor, Malaysia. The inclusion of items covering knowledge, attitude, and practice underscores the questionnaire's comprehensiveness. The absence of items rated as not relevant affirms its adequacy in capturing essential aspects of OSH. However, potential biases and the need for diverse expert perspectives should be acknowledged. Complementing the CVI analysis with other validation methods can further enhance the questionnaire's robustness and validity.

The Content Validation Ratio (CVR) analysis provides valuable insights into the content validity of the questionnaire on occupational safety and health (OSH) among food industry workers in Selangor, Malaysia. The adherence to the minimum acceptable CVR value of > 0.45, as recommended to ensures methodological rigor in the evaluation process [36]. High level of agreement reinforces the robustness of the questionnaire in capturing key aspects of OSH-related knowledge, attitude, and practices among food industry workers. The removal of items labeled as inappropriate, which scored below the acceptable threshold, further demonstrates the rigor of the validation process. By excluding items that did not meet the minimum standard requirement, the questionnaire's focus is narrowed to include only those

deemed essential by expert assessment. This refinement enhances the questionnaire's clarity, relevance, and effectiveness in assessing OSH-related factors among food industry workers.

The 1st revision and final version Q-TRIMOSH-KAP Cronbach's alpha values indicate satisfactory levels of internal consistency for each component of the questionnaire. The improvements observed in Cronbach's alpha values after item deletion and revision suggest that the meticulous review and refinement process based on Cronbach's alpha values and expert recommendations were effective in enhancing the questionnaire's reliability. Specifically, in the Knowledge component, the Cronbach's alpha value increased from 0.705 to 0.716 after the deletion of two items. Similarly, in the Attitude component, the Cronbach's alpha value increased from 0.743 to 0.788 following item deletions and modifications. Likewise, in the Practice component, the Cronbach's alpha value improved from 0.770 to 0.813 after item deletions. These improvements demonstrate the positive impact of item refinement on the internal consistency of the questionnaire. The final Cronbach's alpha coefficients exceeding the threshold of 0.7 indicate satisfactory reliability of the questionnaire in measuring OSH-related knowledge, attitude, and practices among food industry workers. This suggests that the questionnaire items consistently measure the intended constructs and produce reliable results across different administrations. The full questionnaire is available upon request from the corresponding author.

Recommendation

To enhance the pilot study, recommendations include increasing the sample size for greater generalizability and reliability. Diversifying the expert panel ensures comprehensive evaluation of the questionnaire's content validity. Qualitative exploration should accompany quantitative assessments to understand respondents' perceptions and refine items accordingly. Additionally, continual content revisions should balance enhancing internal consistency with maintaining validity. Structural validation methods, such as factor analysis, can complement existing analyses to assess questionnaire coherence. Transparent documentation of revisions and an iterative approach to development ensure accountability and ongoing improvement.

Strength and limitation

The pilot study demonstrates several strengths that contribute to its validity and reliability. Firstly, the meticulous review and refinement process based on both quantitative reliability analyses and qualitative feedback from subject matter experts ensure a comprehensive assessment of the questionnaire's content validity and internal consistency. The inclusion of both quantitative and qualitative approaches allows for a holistic understanding of the questionnaire's effectiveness in measuring knowledge, attitude, and practices

regarding occupational safety and health (OSH) among food industry workers. Additionally, the adherence to established standards for sample size and expert panel composition enhances the study's methodological rigor and ensures robust findings.

However, despite these strengths, the pilot study also has limitations that warrant consideration. One notable limitation is the relatively small sample size used in the preliminary assessment, which may restrict the generalizability of the findings to the broader population of food industry workers in Selangor, Malaysia. A larger and more diverse sample would provide greater confidence in the questionnaire's effectiveness across different settings and contexts. Furthermore, while the study employed various validation methods, such as Cronbach's alpha, Content Validity Index (CVI), and Content Validation Ratio (CVR), there may still be aspects of the questionnaire's validity and reliability that were not fully captured. Future research could benefit from additional validation measures and a more extensive pilot testing phase to address these limitations and further strengthen the questionnaire's utility in assessing OSH-related factors among food industry workers.

The absence of factor analysis in this study, resulting from the limited sample size of 30 participants, will be addressed in future research. We plan to conduct a pilot test with a larger sample of 200-300 participants to enable a more comprehensive factor analysis and exploratory factor analysis (EFA). These findings will be presented in a separate paper, ensuring a thorough evaluation of the questionnaire's structural validity in future studies.

CONCLUSION

This pilot study underscores the effectiveness of the developed Q-TRIMOSH-KAP (Table VI) questionnaire in assessing occupational safety and health (OSH) among food industry workers. Through meticulous refinement and validation processes, the questionnaire demonstrates satisfactory levels of content validity and internal consistency. The findings provide a solid foundation for further research on OSH-related knowledge, attitude, and practices among food industry workers. Overall, this pilot study represents a significant step towards enhancing workplace safety and promoting healthier practices among food industry workers in Selangor, Malaysia.

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