



Counseling on the Cek KLIK (Kemasan, Label, Izin Edar, Kedaluwarsa) to Promote Safe Food Consumption in Tosale Village, Donggala Regency

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ABSTRACTS

Introduction: Consumers in rural Indonesia often lack practical tools to assess food safety at purchase. This community service program delivered participatory counseling on Cek KLIK (packaging, labeling, distribution authorization, and expiry date) and hazardous food additives to residents of Tosale Village, Donggala Regency. **Method:** Activities included lectures, audiovisual materials, product demonstrations, discussions, and a printed booklet, with guidance from Indonesia's National Agency of Drug and Food Control (BPOM). **Result:** Twenty-four residents (75.0% male; mean age 36.9 years) completed a 30-item, five-point questionnaire, comprising 15 retrospective pre-counseling and 15 post-counseling items. Paired scores were analyzed using the Wilcoxon signed-rank test with Holm correction. The overall mean increased from 3.98 to 4.13 (mean difference = 0.16, 95% CI [-0.02, 0.33]; $p = .068$; $r = .37$). Attitude showed the largest increase, from 3.81 to 4.14 (Wilcoxon $p = .052$; paired t-test $p = .024$). Changes in knowledge, skill, and practice were modest, and no comparison remained significant after correction. Overall, 83.3% achieved post-counseling scores of at least 4.0, meeting the 80% target, while 58.3% improved. High baseline scores, small sample size, and the retrospective single-group design limit causal interpretation. **Conclusion:** Future programs should incorporate conventional pre-tests, objective food-safety assessments, and follow-up visits to evaluate skill retention and practical application.

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1. INTRODUCTION

Contaminated food remains a major public health concern worldwide. The World Health Organization's updated estimates indicate that foodborne transmission of 42 biological and chemical hazards caused approximately 866 million illnesses, 1.52 million deaths, and 57.1 million disability-adjusted life years (DALYs) in 2021, highlighting the substantial health burden associated with unsafe food consumption (Lake et al., 2026). Food safety therefore requires not only effective regulation and control across the food supply chain but also informed consumer decisions at the point of purchase.

Chemical hazards are particularly relevant to consumer protection because the safety of packaged and prepared foods cannot always be determined from appearance alone. In Indonesia, concerns include the misuse of hazardous substances and non-permitted synthetic dyes in food products. Recent research has examined the presence of Rhodamine B and Methanyl Yellow in food and beverages, illustrating the continuing importance of surveillance and public awareness of these substances (Simamora & Puspawati, 2023).

Educational interventions can help consumers understand food-related hazards and make more informed choices. For example, an Indonesian educational program on food-additive hazards reported improvements in students' knowledge and awareness, although the magnitude of improvement was limited, indicating that education should be designed with realistic outcomes and appropriate evaluation methods (Amirullah et al., 2025).

One practical approach to consumer-level food safety in Indonesia is Cek KLIK, a campaign promoted by the Indonesian National Agency of Drug and Food Control (Badan Pengawas Obat dan Makanan, BPOM). Cek KLIK stands for Kemasan (packaging), Label (label), Izin Edar (marketing authorization), and Kedaluwarsa (expiry date). These four checks provide consumers with a straightforward framework for examining packaged food before purchase. A recent community outreach program combined food safety counseling, demonstrations, hands-on practice, discussion, and the use of the BPOM Mobile application to introduce Cek KLIK and support consumers' ability to verify packaged-food products (Yusuf et al., 2026).

However, recognizing the steps of Cek KLIK does not necessarily mean that consumers consistently apply them when shopping. Evidence from consumer education research also suggests that information delivery alone may not be sufficient to change established food-related practices. In a study involving rural consumers, information interventions could

facilitate the adoption of safer food-handling practices, while the timing and extent of behavioral change varied according to the intervention (Zhang et al., 2023).

Similarly, experimental research on online food safety interventions found that videos and interactive games could improve food safety beliefs, whereas significant improvements in self-reported behavior were observed specifically in the game-based intervention (Koch et al., 2022). These findings support the value of combining counseling with demonstrations, practical exercises, and take-home educational materials, while also underscoring the need to distinguish participants' immediate responses from measurable changes in knowledge, attitudes, skills, and everyday practices.

Tosale Village in Donggala Regency, Central Sulawesi, provided a relevant example for a community-based food safety education program. The program addressed two interconnected community needs: limited understanding of hazardous food additives and limited preventive screening of packaged food before purchase. Its activities were designed to deliver standardized Cek KLIK counseling based on BPOM guidance, demonstrate how to examine packaged-food products, provide a booklet for continued reference, and assess participants' responses across knowledge, attitudes, self-reported skills, and reported practices. The program involved members of the general community as a non-productive partner group within the community service framework. The implementation of the Cek KLIK educational program in Tosale Village contribute by documenting a practical, community-based approach to food safety education and providing an analysis workflow that may be adapted by other community service teams.

2. METHODS

2.1 Program Design and Implementation

This community-based educational program was designed for residents of Tosale Village, Central Sulawesi, Indonesia. The intervention addressed two related areas: education on hazardous food additives and health promotion through safer food-selection practices. Participatory counseling combined oral presentations, visual materials, printed booklets, practical demonstrations, and interactive discussions. The educational content was developed with reference to guidance from the Indonesian National Agency of Drug and Food Control (BPOM).

The educational session covered formaldehyde (formalin), borax, and Rhodamine B, including their prohibited use in food and potential health risks. Participants received a booklet for reference at home. The practical session introduced Cek KLIK, which involves checking packaging (Kemasan), labeling (Label), marketing authorization (Izin Edar), and expiration dates (Kedaluwarsa). Food products obtained from local markets were used to illustrate food-label assessment and safer purchasing decisions. Participants discussed the products, shared experiences with potentially unsafe food, and received guidance on identifying relevant product information. Classification as meeting requirements (memenuhi syarat, MS) or not meeting requirements (tidak memenuhi syarat, TMS) was applied only where supported by appropriate evidence. Participants were encouraged to share the educational messages within their communities.

2.2 Participants and Study Setting

The activity was conducted on August 8, 2026, at the Tosale Village Hall, Donggala Regency, Central Sulawesi Province, Indonesia. All 24 residents who attended the session completed the evaluation questionnaire and were included through total sampling of the attendees. Participants represented four village hamlets; one respondent provided a road address instead of a hamlet designation. The evaluation therefore describes the participating residents rather than a representative sample of the entire village.

2.3. Instrument and Data Preparation

The questionnaire developed based on five constructs: knowledge of hazardous food additives, knowledge of Cek KLIK, attitudes toward food safety, food-safety-related skills, and reported food-selection practices. Each construct contained three statements referring to the period before counseling and three statements referring to the period after counseling, yielding 30 items in total. Responses were recorded on a five-point Likert-type scale, with higher scores indicating stronger agreement.

Before analysis, the dataset was checked for missing values, out-of-range responses, and coding inconsistencies. Free-text demographic entries were standardized, including age, hamlet, and occupation categories. Response patterns were also screened for potentially low-quality responses. Respondents with a standard deviation below 0.25 across the 30 items or responses of 1 on at least half of the items were flagged for review. These criteria were treated as screening indicators rather than automatic grounds for exclusion.

2.4. Statistical Analysis

All statistical analyses were performed using R software. Construct scores were calculated as the mean of the three corresponding items for each assessment period. Exploratory within-participant comparisons were performed using the Wilcoxon signed-rank test, with the standardized test statistic and effect size reported as $r = |Z|/\sqrt{n}$, where n denotes the number of nonzero paired differences. Holm's procedure was used to adjust p values across the five constructs and the overall score, if the latter was justified as a meaningful composite.

Paired-samples t tests were considered supplementary analyses. Normality was assessed using the Shapiro-Wilk test on the relevant paired differences. Where appropriate, mean differences, 95% confidence intervals, and Cohen's d_z were reported. Given the small sample and the non-identical statements, all comparisons were interpreted cautiously and were not considered definitive evidence of intervention-induced change.

Program-monitoring indicators included the proportion of participants with higher post-counseling construct scores and the proportion whose post-counseling scores reached 4.0 or higher. The latter represented a descriptive threshold equivalent to 80% of the maximum numerical score, rather than a validated measure of adequate knowledge or demonstrated competence. Cronbach's α was calculated separately for each construct and assessment period, with reliability estimates interpreted cautiously given the three-item subscales and small sample.

3. RESULT AND DISCUSSION

3.1 Participant Characteristics

Twenty-four residents took part (Figure 1 & Table 1). Men made up 75.0% of the group, and the mean age was 36.9 years (range 23-57). Eighteen participants (75.0%) held a senior high school diploma (SMA) as their highest qualification, and six (25.0%) held a bachelor's degree (S1). Farmers and laborers formed the largest occupational group ($n = 6$), followed by village officials ($n = 5$). Village officials, civil servants, and teachers together accounted for 8 of the 24 participants.

Table 1. Characteristics of Participants (N = 24)

Characteristic	<i>n</i>	%
Sex		
Male	18	75.0
Female	6	25.0
Age group		
≤30 years	7	29.2
31-40 years	9	37.5
41-50 years	5	20.8
>50 years	3	12.5
Age in years, <i>M</i> (<i>SD</i> ; range)	36.9 (9.6; 23-57)	
Education		
Senior high school (SMA)	18	75.0
Bachelor's degree (S1)	6	25.0
Occupation		
Farmers and laborers	6	25.0
Village officials	5	20.8
Entrepreneurs	3	12.5
University students	3	12.5
Homemakers	3	12.5
Civil servants and teachers	3	12.5
Employees	1	4.2

Note. Percentages are calculated using the total number of participants (N = 24).

Figure 1. Community Counseling Session on Food Safety and Cek KLIK

3.2 Data Analysis

The dataset had no missing values and no out-of-range scores. Three participants met the straightlining criterion: one answered 5 on all 30 items, one answered 4 on all 30 items, and one answered 4 on 29 items and 5 on one item. One further participant answered 4 or 5 on items 1 to 7 and then answered 1 on all 23 remaining items, a pattern that points to a response error or a misread scale. The team kept all four participants in the main analysis and tested the effect of the extreme pattern in a sensitivity analysis.

Table 2 summarizes the questionnaire structure and internal consistency of the construct scales. The attitude and practice scales met the conventional $\alpha = .70$ criterion in both assessment periods, whereas the skill scale fell slightly below this threshold ($\alpha = .69$ before and $.65$ after). Both knowledge scales showed low internal consistency, with α values ranging from $.02$ to $.57$, warranting cautious interpretation of the knowledge results. The three baseline items concerning additives in general, formalin, and borax address different substances. In addition, most responses were rated 4 or 5, suggesting limited response variability. These characteristics may have contributed to the low internal consistency, although the available data do not establish the cause.

Table 2. Questionnaire Structure and Internal Consistency

Construct	Items “before”	Items “after”	α before	α after
Knowledge: hazardous additives	1-3	4-6	.02	.48
Knowledge: Cek KLIK	7-9	10-12	.28	.57
Attitude	13-15	16-18	.74	.74
Skill	19-21	22-24	.69	.65
Practice	25-27	28-30	.81	.76
Overall (15 items per period)	All “before” items	All “after” items	.86	.90

Note. α = Cronbach’s alpha. Each construct comprises three items per assessment period. Cronbach’s alpha should be interpreted cautiously for scales with few items (Tavakol & Dennick, 2011).

All five constructs moved upward (Table 3 and Figure 2). The overall score rose from 3.98 (SD = 0.60) to 4.13 (SD = 0.65), a mean difference of 0.16 (95% CI [-0.02, 0.33]; +3.9%). The Wilcoxon test returned $p = .068$ with a medium effect ($r = .37$), and the paired t test returned $p = .073$ ($d_z = 0.38$).

Attitude showed the largest gain, from 3.81 to 4.14. The mean difference was 0.33 (95% CI [0.05, 0.62]; +8.8%), with Wilcoxon $p = .052$, $r = .40$, and paired t test $p = .024$. Skill (+0.19;

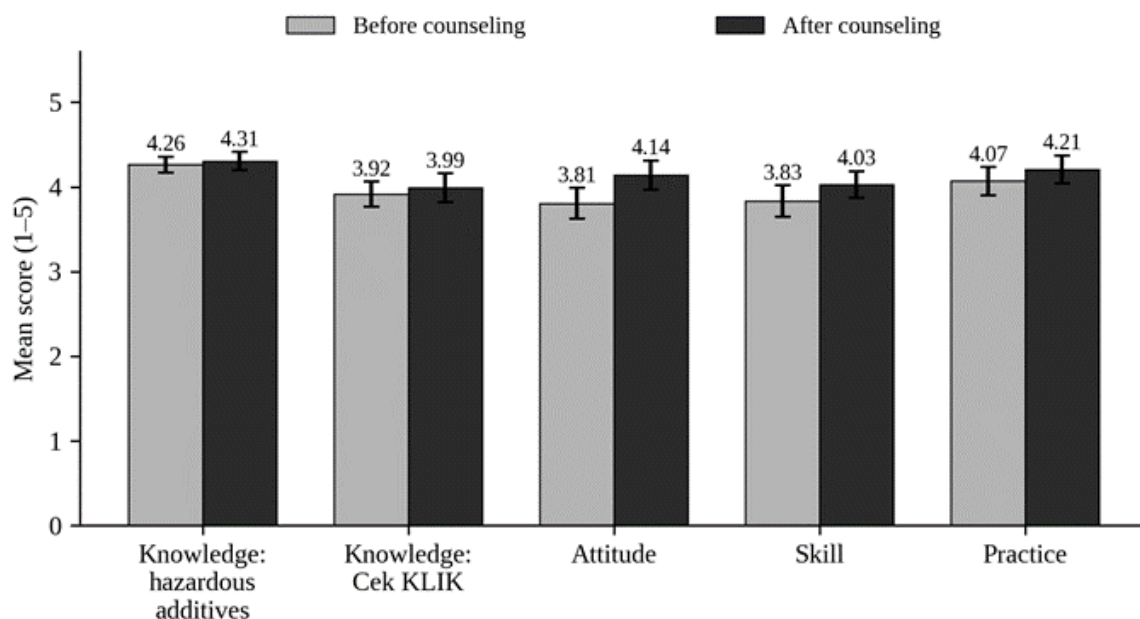
+5.1%) and practice (+0.14; +3.4%) rose by smaller amounts. Their effect sizes were medium ($r = .31$ and $.30$), but their confidence intervals include zero. Knowledge of hazardous additives (+0.04) and knowledge of Cek KLIK (+0.07) barely moved ($r = .14$ and $.08$). After Holm correction, no comparison reached statistical significance, and the smallest adjusted p value was $.313$ for attitude.

Table 3. Paired Comparison of Scores Before and After the Counseling Session (N = 24)

Construct	Before <i>M</i> (<i>SD</i>)	After <i>M</i> (<i>SD</i>)	Mean difference [95% CI]	Change (%)	Wilcoxon <i>p</i>	<i>r</i>	Holm <i>p</i>
Knowledge: hazardous additives	4.26 (0.46)	4.31 (0.53)	0.04 [-0.21, 0.29]	1.0	.498	.14	.995
Knowledge: Cek KLIK	3.92 (0.72)	3.99 (0.84)	0.07 [-0.30, 0.44]	1.8	.711	.08	.995
Attitude	3.81 (0.90)	4.14 (0.85)	0.33 [0.05, 0.62]	8.8	.052	.40	.313
Skill	3.83 (0.91)	4.03 (0.77)	0.19 [-0.02, 0.41]	5.1	.134	.31	.538
Practice	4.07 (0.82)	4.21 (0.80)	0.14 [-0.03, 0.31]	3.4	.145	.30	.538
Overall	3.98 (0.60)	4.13 (0.65)	0.16 [-0.02, 0.33]	3.9	.068	.37	.339

Note. Scores range from 1 to 5. Wilcoxon p values were obtained using the Wilcoxon signed-rank test with continuity correction. Holm-adjusted p values account for six comparisons. Effect size r was calculated as $|Z|/\sqrt{n}$, where n denotes the number of nonzero paired differences.

Figure 2. Mean Scores Before and After the Counseling Session by Construct



Note. Error bars represent one standard error of the mean (SEM).

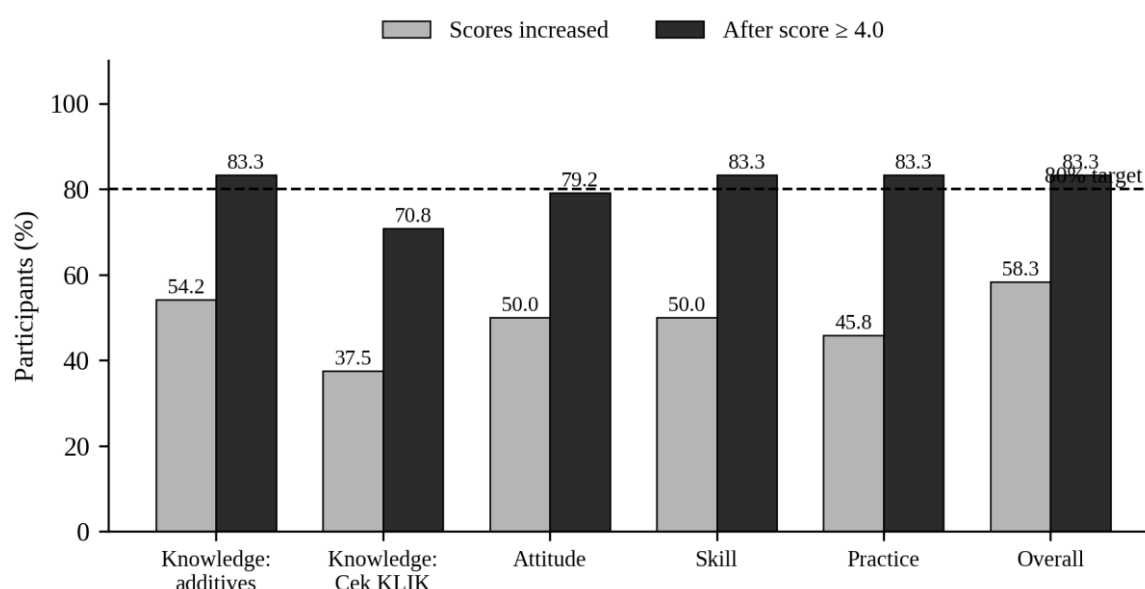
Table 4 shows the share of participants whose scores rose, stayed level, or fell. Overall, 58.3% of participants rose, 12.5% stayed level, and 29.2% fell. Knowledge of hazardous additives had the highest share of risers by construct (54.2%), and knowledge of Cek KLIK had the lowest (37.5%) together with an equal share of decliners (37.5%). After the session, 83.3% of participants scored 4.0 or higher overall. By construct, that share ran from 70.8% (knowledge of Cek KLIK) to 83.3% (knowledge of additives, skill, and practice), and attitude stood at 79.2% (Figure 3).

Table 4. Distribution by Direction of Change and Post-Counseling Score Level (N = 24)

Construct	Increased (%)	Unchanged (%)	Decreased (%)	After score $\geq$ 4.0 (%)
Knowledge: hazardous additives	54.2	16.7	29.2	83.3
Knowledge: Cek KLIK	37.5	25.0	37.5	70.8
Attitude	50.0	33.3	16.7	79.2
Skill	50.0	29.2	20.8	83.3
Practice	45.8	37.5	16.7	83.3
Overall	58.3	12.5	29.2	83.3

Note. Percentages may not sum to 100 due to rounding.

Figure 3. Progress Toward the 80% Participant Target

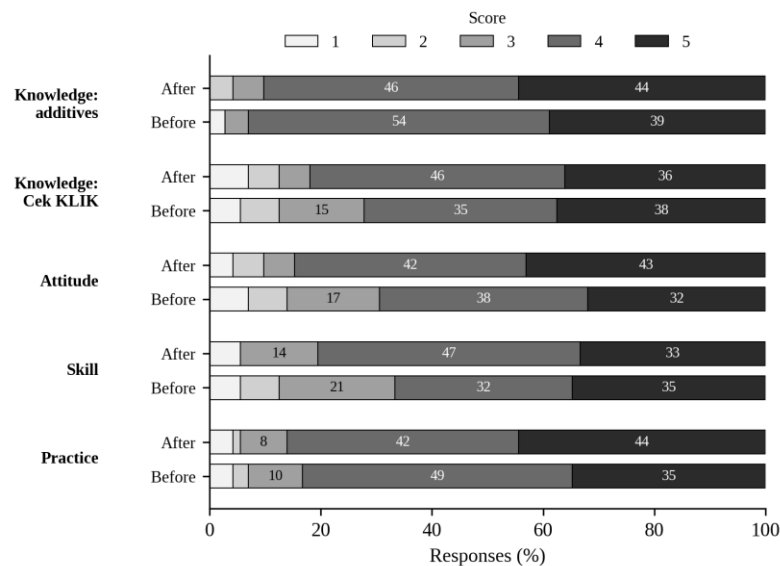


Note. Light bars show participants whose score increased. Dark bars show participants whose “after” score reached 4.0. The dashed line marks the 80% target.

Figure 4 shows that most responses fell on 4 and 5 in both periods. The share of responses at 4 or 5 moved from 76.9% before to 84.7% after across all items. The shift was largest for attitude (69.4% to 84.7%) and skill (66.7% to 80.6%), moderate for knowledge of Cek KLIK

(72.2% to 81.9%), small for practice (83.3% to 86.1%), and slightly negative for knowledge of additives (93.1% to 90.3%).

Figure 4. Distribution of Responses by Construct and Assessment Period



Note. Labels are displayed only for segments representing at least 7% of responses. Each bar aggregates responses to the three items within a construct for one assessment period.

Appendix A lists the item statistics. After the session, participants gave the highest agreement to the statement that Rhodamine B and Methanyl Yellow are prohibited in food ($M = 4.46$; 91.7% agreement), to the statement that they would apply Cek KLIK in daily shopping ($M = 4.29$; 91.7%), and to the statement that unsafe food can cause illness ($M = 4.08$; 91.7%). Among the “before” statements, agreement was lowest for the belief that checking food safety before buying is important ($M = 3.25$; 41.7%), for knowing what Cek KLIK is ($M = 3.54$; 58.3%), and for being able to check packaging independently ($M = 3.67$; 58.3%). These three items mark the baseline gaps that the counseling targeted. Because “before” and “after” statements differ, item-level pairs are not directly comparable.

In a sensitivity analysis excluding the participant with the extreme response pattern ($N = 23$), the direction of the observed changes remained consistent, and several effect estimates increased (Table 5). The overall score increased from 4.06 to 4.24, corresponding to a mean difference of 0.18 (95% CI [0.01, 0.35]) or a 4.5% increase. The Wilcoxon signed-rank test yielded $p = .027$, with a medium effect size ($r = .46$), while the paired t test yielded $p = .036$. However, the Holm-adjusted p value for the overall comparison was .165. Attitude increased by 0.35 points (+8.9%), with a Wilcoxon p value of .052. Thus, the apparent statistical significance of the overall unadjusted result depended partly on the inclusion or exclusion of

one participant, and the overall result did not remain statistically significant after adjustment for multiple comparisons.

Table 5 Sensitivity Analysis Excluding the Participant With the Extreme Response Pattern

Construct	Mean diff. (<i>n</i> = 24)	Wilcoxon <i>p</i> (<i>n</i> = 24)	Mean diff. (<i>n</i> = 23)	Wilcoxon <i>p</i> (<i>n</i> = 23)	<i>r</i> (<i>n</i> = 23)
Knowledge: hazardous additives	0.04	.498	0.09	.272	.23
Knowledge: Cek KLIK	0.07	.711	0.13	.463	.15
Attitude	0.33	.052	0.35	.052	.40
Skill	0.19	.134	0.20	.134	.31
Practice	0.14	.145	0.14	.145	.30
Overall	0.16	.068	0.18	.027	.46

Note. Mean differences represent post-counseling minus pre-counseling scores. Results for *N* = 24 include all participants, whereas results for *N* = 23 exclude the participant who responded 1 to 23 of the 30 questionnaire items.

Mean scores increased across all five constructs, although the magnitude of change was modest. The overall gain of 0.16 points on a five-point scale did not reach conventional statistical significance in the primary Wilcoxon analysis, and no comparison remained statistically significant after correction for multiple testing. Attitude showed the largest increase, with a medium effect size and a paired *t*-test *p* value below .05; however, the Wilcoxon test, which was designated as the primary analysis, yielded *p* = .052. These findings should therefore not be interpreted as definitive evidence of program effectiveness. Conversely, the absence of statistically significant results does not establish that the intervention had no effect. The small sample limits the ability to detect modest changes, and the observed effect sizes should be interpreted with this limitation in mind.

High baseline scores may partly explain the modest changes observed. Mean baseline scores ranged from 3.81 to 4.26 across the five constructs, and 76.9% of baseline item responses were rated 4 or 5. These relatively high initial scores left limited room for further improvement and may have reduced the sensitivity of the assessment to change (Šimković & Träuble, 2019). In addition, eight of the 24 participants were village officials, civil servants, or teachers, some of whom may already have been familiar with basic food-safety information. This possibility is consistent with the high baseline score for knowledge of hazardous additives (*M* = 4.26), for which 93.1% of baseline responses were rated 4 or 5. The proportion decreased slightly after the session. However, the study did not directly assess participants' prior exposure to food-safety education, so the proposed explanation remains tentative.

The largest gains were observed in constructs with relatively lower baseline scores. Attitude and skill started at 3.81 and 3.83, respectively, while knowledge of Cek KLIK started at 3.92. Item-level results point to potential gaps in perceived importance and familiarity with the Cek KLIK procedure: 41.7% of participants agreed with the relevant baseline statement about the importance of checking food safety before purchase, and 58.3% agreed that they already knew what Cek KLIK was. The increase in attitude scores may suggest that the counseling helped reinforce the perceived importance of food-safety practices. Nevertheless, because the study had no comparison group and used self-reported measures, it cannot establish that the counseling caused these changes. The interpretation that attitudes may change more readily than factual knowledge should therefore be treated as a hypothesis rather than a demonstrated mechanism (Glanz et al., 2015).

Limonu & Saman, 2022 reported participant reactions to a Cek KLIK session in a neighboring province, and their respondents rated the material favorably. This program measured outcomes instead of reactions. The modest effects here show why reaction data alone cannot establish impact. The design also belongs to the class of uncontrolled before-and-after studies that (Young et al., 2015) judged to give low confidence in pooled effects. The present results are best treated as preliminary and as a baseline for the next cycle of the program.

The data suggest three adjustments. First, future sessions should spend more time on the least secure skills. After the session, the lowest-rated statements concerned recognizing expired food ($M = 3.88$) and understanding why permit numbers matter ($M = 3.92$). Hands-on exercises with permit lookup in the BPOM Mobile application and with date formats would address both. Second, the team should keep the booklet and the plan for small-group re-sharing, and it should involve the village officials who attended, because they hold regular community meetings. Third, the evaluation should return to the original plan of a conventional pre-test, a post-test, and an objective product-sorting task scored against MS and TMS standards, so that the skill target of a 20% gain can be tested directly.

Several limitations should be considered. First, the single-group design without a comparison group prevents attribution of the observed changes to the counseling session alone. Second, the retrospective assessment of baseline responses after the session may have introduced recall error and response shift (Pratt et al., 2000). Third, the baseline and post-counseling statements differed in wording; consequently, the analysis compared construct-

level scores derived from two sets of items rather than responses to identical items. Fourth, the sample was small, comprised attendees rather than a randomly selected community sample, and was predominantly male. Fifth, the knowledge scales showed low internal consistency ($\alpha = .02-.57$), weakening confidence in the corresponding construct-level findings. Sixth, self-reported skills and practices may not accurately reflect observed behavior, and social desirability bias may have influenced responses (Krumpal, 2013). Finally, three participants exhibited straightlining patterns, and one participant showed an extreme response pattern, raising concerns about response quality (Kim et al., 2019). The sensitivity analysis further showed that the statistical significance of the overall unadjusted result depended partly on the treatment of one participant. Correction for multiple comparisons reduced the likelihood of false-positive findings but also made it more difficult to detect modest effects.

The program built three supports for continuation. The booklet stays with residents and can serve as a reference at any time. Participants agreed to share the material in small gatherings. BPOM involvement gives the content an official source that residents and village officials can cite. A follow-up visit, ideally within three to six months, should check whether the screening routine persists and should add a measure of observed shopping behavior.

4. CONCLUSION

A counseling session on Cek KLIK and hazardous food additives was delivered to 24 residents of Tosale Village. Mean scores increased across all five measured constructs, with the largest gain observed in attitude; however, the overall changes were modest, and no comparison remained statistically significant after correction for multiple testing. Following the session, 83.3% of participants achieved an overall score of at least 4.0, meeting the 80% target based on the post-counseling score criterion. In contrast, 58.3% of participants showed an increase in their overall scores, falling short of the 80% target based on improvement. The mean skill score increased by 5.1% relative to baseline, below the predefined 20% improvement target. These findings indicate that the program met its post-counseling score target but did not meet its improvement targets. Further evaluation using a controlled design and an objective assessment of food-safety skills is needed to determine whether the observed changes reflect intervention effects and translate into safer food-selection practices.

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