

Parents' awareness and practice of COVID-19 health protocols: Basis for glocalized IEC material development

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Abstract

The COVID-19 pandemic emphasized the critical role of parents in ensuring accurate health information and consistent preventive practices at home. This study assessed parents' awareness of key COVID-19 facts and the extent to which they adhered to recommended health protocols, serving as the basis for developing a glocalized information, education, and communication (IEC) material. Using a design research approach guided by Stanford University's Design Thinking Model, the study surveyed 1,200 parents in Aklan, Philippines, and consulted experts in IEC development. Results showed that parents were generally aware of COVID-19 health facts ($M=3.03$) and exhibited a moderate level of protocol adherence ($M=3.15$). Awareness was lowest for vaccination-related information, influenced by past vaccine controversies and inconsistent public communication. A strong positive correlation ($r=0.807$, $p<0.001$) indicated that higher awareness was associated with better adherence. Based on these findings, a culturally contextualized trifold pamphlet integrating local language, familiar visuals, and community-relevant guidelines was developed and evaluated. Parents and experts rated the material as highly acceptable ($M=3.71$), citing its clarity, cultural fit, and practical usefulness. While the IEC resource shows promise for supporting community health education, further studies are needed to determine its long-term influence on behavior and pandemic preparedness.

Keywords: COVID-19; glocalization; IEC material; design thinking; pandemic preparedness

INTRODUCTION

The COVID-19 pandemic brought significant disruptions to education, public health, and daily life worldwide, underscoring the essential role of parents in reinforcing accurate health information and preventive behaviors at home. Since the virus was first identified in December 2019, governments have implemented protocols such as mask-wearing, handwashing, and physical distancing (World Health Organization [WHO], 2021). However, global and national experiences show that public compliance has been uneven, influenced by misinformation, shifting policies, and gaps in health communication systems (Garbin et



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al., 2023; Hou et al., 2023). These challenges highlight the need for context-specific strategies that strengthen household-level health practices.

In the Philippines, these communication and compliance issues are similarly observed. As of 2021, WHO recorded more than 1.3 million confirmed cases and 22,788 deaths in the country, while the province of Aklan reported 15,246 cases and 366 deaths (Villanueva, 2022). Despite extensive public health campaigns, awareness and adherence to preventive measures remained inconsistent. Scholars attribute this to persistent misinformation, cultural barriers, and erratic government communication, which collectively undermine public trust and willingness to follow health protocols (Biswas et al., 2023; Buhat, 2021). Parents—who directly influence children's everyday health behaviors—are particularly affected by these systemic issues.

Although various IEC materials on COVID-19 are available, evidence suggests that generic information tools are often insufficient for changing behavior, especially when they do not align with local cultural and linguistic contexts (Hou et al., 2023; Biswas et al., 2023). Only a limited number of studies, such as Zakiah and Suyati (2021), have examined parents' awareness and practice of COVID-19 health protocols at the household level. This reveals a clear research gap—the need for parent-focused, culturally responsive IEC materials that can bridge knowledge deficits and improve consistent health practices within families.

To address this gap, the concept of glocalization becomes relevant. Nagal (2020) defines glocalization as an approach that merges global standards with local cultural and linguistic relevance to ensure greater acceptance and engagement. Later work by Nagal (2021) shows that glocalized materials enhance comprehension and user engagement by making content relatable while preserving globally accepted health guidelines. By embedding familiar settings, local language, and culturally resonant visuals, glocalized IEC resources may overcome barriers experienced in traditional information campaigns.

Hence, the present study examined parents' awareness of COVID-19 health facts and their adherence to recommended health protocols in Aklan. The findings served as the basis for developing and validating a glocalized IEC material tailored to the community. Specifically, the study aimed to: (1) assess parents' knowledge of COVID-19 in terms of etiology, transmission, pathophysiology, and vaccination; (2) evaluate compliance with health protocols involving health promotion, disease prevention, treatment, and rehabilitation; (3) determine the relationship between awareness and practice; (4) develop a glocalized IEC material for parents in Aklan; and (5) assess the material's comprehensiveness, attractiveness, acceptability, involvement potential, and inducement to action.

METHOD

The study employed design research methodology utilizing both quantitative and qualitative approaches to assess parents' COVID-19 awareness and health protocol practices as well as to. Design research, as explained by Nagal (2020), is the systematic analysis, design, and evaluation of educational interventions with the dual aim of generating research-based solutions for complex problems in educational practice and advancing knowledge. The study specifically used the Design Thinking model in crafting the pamphlet. Attributed to Innovation Design Engineering Organization's (IDEO) founder David Kelley, Design Thinking as defined by Dam (2025) is a design methodology that provides a solution-based approach to solving problems. It has five stages delineated by the Hasso-Plattner

Institute of Design at Stanford University ([Turpin et al., 2023](#)) as follows: empathize, define, ideation, prototype, and testing. By cycling through these five Design Thinking stages, the study moved from empathetic insight into Aklan parents' realities to a rigorously tested, glocalized pamphlet ready for deployment as both a practical health tool and a model for future culturally anchored IEC initiatives.

Respondents

The study involved parents of learners in the DepEd Division of Aklan and experts in IEC material development. A total of 1,200 parents participated in the survey on COVID-19 awareness and health protocol practices. They were selected through convenience sampling, which was necessary because the study was conducted during the COVID-19 pandemic when mobility restrictions and health risks made probability sampling impractical. As exemplified in the study of [Zhang and Velez \(2022\)](#), Convenience sampling is a non-probability sampling method where researchers select participants based on their easy availability. The parent respondents represented a mix of mothers, fathers, and guardians who served as primary household decision-makers. From this larger group, 60 parents were purposively selected to evaluate the prototype IEC material based on their availability and willingness to participate in follow-up activities.

Two groups of experts also contributed to the study. Ten experts first participated in a focused group discussion to provide face and content validation of the IEC material, followed by 60 additional experts who evaluated the final pamphlet using the IEC Material Evaluation Form. These experts included medical practitioners, science educators, LRMDS coordinators, ICT professionals, and specialists in language and layout design, all chosen for their relevant expertise and availability during data collection. While convenience sampling allows data gathering under pandemic constraints, it also limits the generalizability of findings; thus, results should be interpreted with awareness of this methodological limitation.

Instruments

Three primary research instruments were utilized in this study: (1) the Awareness on COVID19 Facts and Practice of Health Protocols Survey, (2) FGD protocol, and (3) IEC Material Evaluation Form (IMEF). These tools were designed to generate quantitative and qualitative data that served as the basis for developing and evaluating the glocalized IEC material on COVID-19. The tools were validated by three experts and pilot tested to 60 parents generating a Cronbach's alpha of $\alpha = 0.87$ for the awareness scale, and $\alpha = 0.90$ for the practice scale, denoting good to excellent reliability. The IMEF was pilot-tested to 20 experts generating a Cronbach's alpha of $\alpha = 0.92$, confirming excellent internal consistency.

The Awareness on COVID19 Facts and Practice of Health Protocols Survey consisted of three parts: (1) demographic profile, (2) awareness of COVID-19 facts, and (3) practice of COVID-19 health protocols. Respondents rated their awareness and practice using a four-point Likert scale in the following categories: etiology, transmission, pathophysiology and vaccination for awareness; and health promotion, disease prevention, treatment, and rehabilitation for practice. Each category is composed of three indicators each.

The FGD protocol was developed for experts who were invited as key informants in evaluating the standards of good IEC material on COVID-19. The protocol contained preliminary questions related to difficulties in understanding COVID-19 facts and practices, followed by in-depth questions on the evaluation of the developed IEC material. The FGD provided qualitative insights regarding comprehensiveness, attractiveness, acceptability, involvement potential, and inducement to action of the developed pamphlet. It also served

as a platform for experts to give recommendations for the refinement and cultural alignment of the IEC prototype.

After the development of the IEC materials, both parents and experts evaluated the pamphlet using the IMEF. The instrument employed a four-point rating scale to assess five major criteria: (1) comprehensiveness, (2) attractiveness, (3) acceptability, (4) involvement potential, and (5) inducement to action. Evaluators provided both numerical ratings and qualitative comments. This evaluation ensured that the final IEC material was accurate, engaging, culturally appropriate, and effective in promoting COVID-19 awareness and adherence to health protocols.

Procedures

The research followed the steps in Design Thinking Model from the Hasso-Plattner Institute of Design at Stanford University as an approach (Durski et al., 2020): empathizing, defining, ideating, prototyping, and testing. Figure 1 summarizes the procedure of this study.

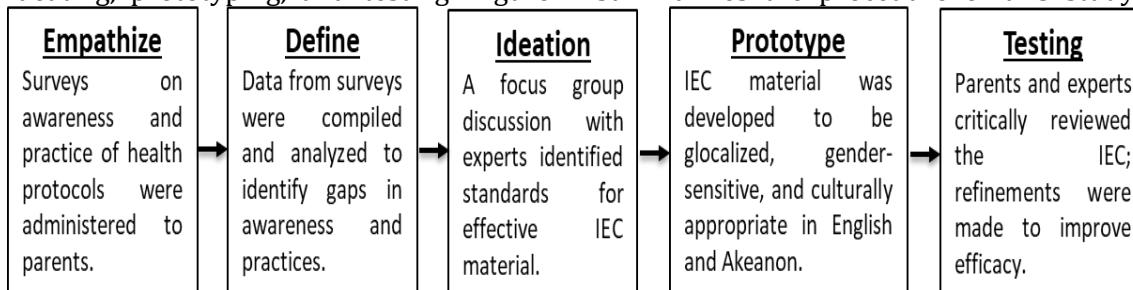


Figure 1. Flowchart of procedure for COVID-19 IEC material development

Data analysis

Quantitative data were obtained from the results of the survey on awareness and practice of parents regarding COVID-19 as well as the IMEF. A Statistical Package for the Social Sciences (SPSS) version 21 software was used to compute the data. Descriptive statistics (Mean and Standard Deviation) and inferential statistics (Spearman's rho) were used as exemplified in the statistical analysis of the study of Nagal et al. (2025). Qualitative data from FGD and free-verse remarks from the IMEF were used to supplement the quantitative results. Following the rigor of another study (Nagal & Paris, 2025), member checking and qualitative data analysis validation were done to ensure accuracy of findings.

RESULTS AND DISCUSSION

The results of the study are presented in this section centered around the awareness of COVID-19 health facts among parents, the extent of compliance with health protocols, and the correlation between levels of awareness and practice. It explained the process of developing and pilot-testing a glocalized IEC material to improve parents' knowledge and compliance of health measures for COVID-19.

Parents' level of awareness on COVID-19 health facts

The study found that parents in Aklan had a moderate level of awareness regarding COVID-19 health facts, with an overall mean score of 3.03 (Aware). This means that the parents have a good understanding of COVID-19. Among the four categories, awareness of disease transmission received the highest rating (3.13, Aware), indicating that parents were well-informed about how the virus spreads. However, awareness of vaccination programs was

rated the lowest (2.92, Aware). Table 1 presents the summary of the awareness levels of parents in four categories.

Table 1. Over-all summary of parents' awareness on COVID-19 health facts

OVERALL AWARENESS (n=1200)	Weighted Mean	SD	Description	Interpretation
Disease Etiology and Incidence	2.99	0.11	Aware	Parents have a good understanding of COVID-19
Disease Transmission	3.13	0.02	Aware	Parents have a good understanding of COVID-19
Disease Pathophysiology	3.08	0.01	Aware	Parents have a good understanding of COVID-19
Vaccines and Vaccination Program	2.92	0.12	Aware	Parents have a good understanding of COVID-19
TOTAL WEIGHTED MEAN:	3.03	1.03	Aware	Parents have a good understanding of COVID-19

Legend: 3.51-4.00 = Highly Aware; 2.51-3.50 = Aware; 1.51-2.50 = Partially Aware; 1.00-1.50 = Unaware

The findings revealed that parents in Aklan were aware of COVID-19 health facts. Among the four categories, disease transmission had the highest awareness level suggesting that parents were well-informed about how the virus spreads. This aligns with previous studies (Rehman et al., 2021; Tripathi et al., 2020) indicating that most individuals are highly aware of disease transmission due to the intensive global information campaigns. However, awareness of vaccines and vaccination programs was the lowest which experts during the FGD attributed to misinformation and public distrust stemming from past vaccine-related issues, such as the Dengvaxia controversy (Halstead et al., 2020). FGD further revealed skepticism due to inconsistent government communication of protocols and concerns about vaccine side effects conforming with the study of Raut et al. (2023).

Parents' level of COVID-19 health protocol practice

The overall mean score for health protocol compliance among parents was 3.15 (Moderate Level of Practice), suggesting that while parents followed health guidelines, compliance was not consistent. The highest-rated compliance was observed in disease prevention protocols (3.23, Moderate Level of Practice), particularly in wearing face masks and frequent handwashing. However, health promotion and rehabilitation protocols received lower compliance ratings (3.11, Moderate Level of Practice), indicating gaps in knowledge and accessibility of healthcare interventions pre- and post-COVID-19 infections. Table 2 presents a summary of the awareness levels of respondents in four categories.

Table 2. Overall summary of parents' level of COVID-19 health protocol practice

OVERALL PRACTICE (n=1200)	Weighted Mean	SD	Description	Interpretation
Health Promotion Practices	3.11	0.06	Moderate level of practice	Parents moderately follow COVID-19 health protocols but are not consistent.
Disease Prevention Protocols	3.23	0.06	Moderate level of practice	Parents moderately follow COVID-19 health protocols but are not consistent.
Treatment Protocols	3.16	0.07	Moderate level of practice	Parents moderately follow COVID-19 health protocols but are not consistent.
Rehabilitative Protocols	3.11	0.03	Moderate level of practice	Parents moderately follow COVID-19 health protocols but are not consistent.
TOTAL WEIGHTED MEAN:	3.15	1.04	Moderate level of practice	Parents moderately follow COVID-19 health protocols but are not consistent.

Legend: 3.51-4.00 = High level of practice; 2.51-3.50 = Moderate level of practice; 1.51-2.50 = Low level of practice; 1.00-1.50 = Very low level of practice

Parents exhibited a moderate level of health protocol practice with the highest compliance observed in disease prevention protocols. This includes wearing face masks, maintaining physical distancing, and regular hand hygiene. These findings are consistent with the study of Tamang et al. (2020), where 78.9% of participants reported compliance with preventive health measures. However, health promotion and rehabilitative protocols received the lowest scores, indicating health protocol adherence problems in pre-infection and post-recovery care. Key informants in the FGD suggested that poor policy enforcement and lack of penalties for non-compliance contributed to these gaps, as many individuals would only observe protocols when authorities were present. This accords with the study of Yen and Liu (2021) claiming that an effective compliance regime for COVID-19 includes a comprehensive policy mix, constant communication, and leveraging street-level officials in the implementation of policies. Such strategies are also proven to be effective in Indonesia as confirmed in the study of Khasanah et al. (2024).

Relationship between the parents' levels of COVID19 awareness and health protocol practice

A Spearman's rho correlation coefficient of 0.807 ($p=0.000$) indicated a strong positive correlation between COVID-19 awareness and health protocol practice levels among parents. This means that parents who had a higher awareness of COVID-19 facts were more likely to comply with health protocols, emphasizing the importance of effective health education. Table 3 presents the Spearman's rho computation.

Table 3. Correlation between the COVID-19 awareness and health protocol practice

		Spearman's rho Correlations	
		Awareness on COVID-19 Health Facts	COVID-19 Health Protocol Practice
Awareness on COVID-19 Health Facts	Correlation Coefficient	1	.807**
	Sig. (2-tailed)	.	0.000
	N	1200	1200
COVID-19 Health Protocol Practice	Correlation Coefficient	.807**	1
	Sig. (2-tailed)	0.000	.
	N	1200	1200

**. Correlation is significant at the 0.01 level (2-tailed).

A strong positive correlation ($r=0.807$, $p=0.000$) was found between parents' awareness levels and their health protocol practices, suggesting that higher awareness leads to better adherence to health protocols. This finding supports previous research by Tamang et al. (2020) and Lee et al. (2021), which also found that knowledge significantly influences behavior in health compliance. In a study by Gautam et al. (2020), the health literacy levels of patients in Jodhpur, Rajasthan significantly predicts their COVID-19 behaviors affirming the findings of the present study. The results prove that the Theory of Planned Behavior and the Health Belief Model are correct in positing that aware people are more likely to engage in healthy behaviors (Karl et al., 2022).

Attributes of the developed glocalized COVID-19 Information, Education and Communication (IEC) material

Based on the study's findings, a glocalized IEC material was developed to address the identified gaps in awareness and practice. The IEC material, titled "*Ro Halit nga COVID-19: Mga Sueondanan*", was designed as an A4-sized trifold pamphlet that featured COVID-19 health facts and protocols in standard Akeanon and English. The pamphlet was printed back-to-back and tri-folded on a glossy A4-sized photo paper. The text font is Century Gothic, font size 10, and line spacing at 2pt. The headings have bigger fonts and are created

more artistically than the regular texts. The assembly of parts of the IEC material, typing, lay-outing, designing, and finalizing were executed by the researcher. Glocalization in the IEC material is integrated through (1) the use of Mother Tongue language (Standard Akeanon) with English translation; and (2) using localized examples as illustrations; and (3) integrating a universal language (English) for the translation. Figure 2 and 3 presents the developed IEC material.

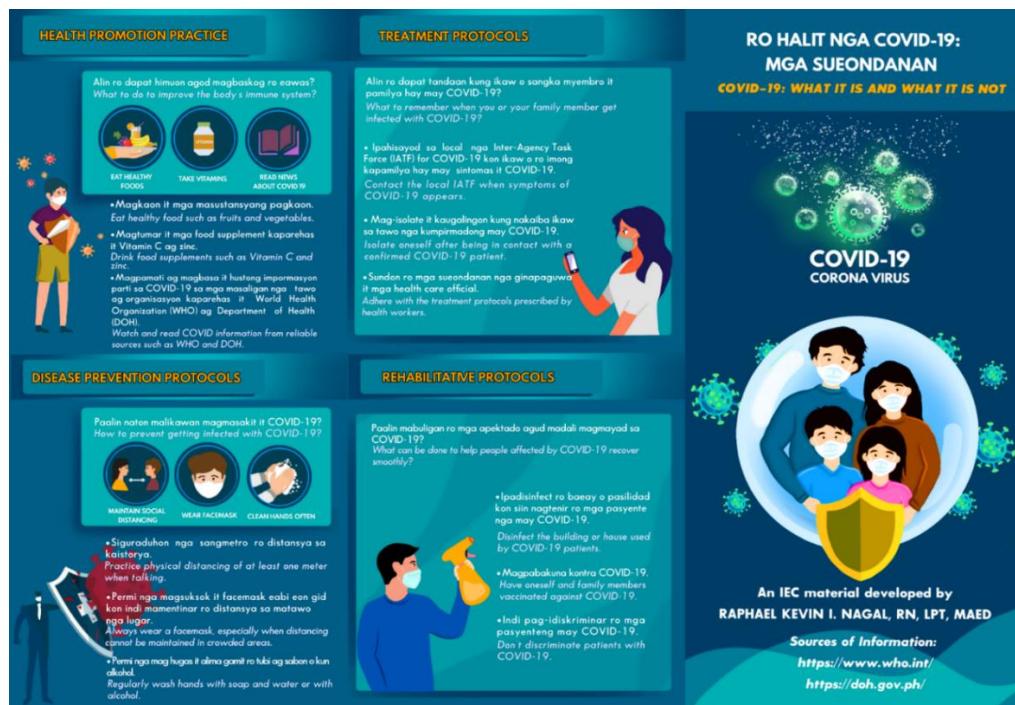


Figure 2. The front page of the developed IEC material for COVID-19

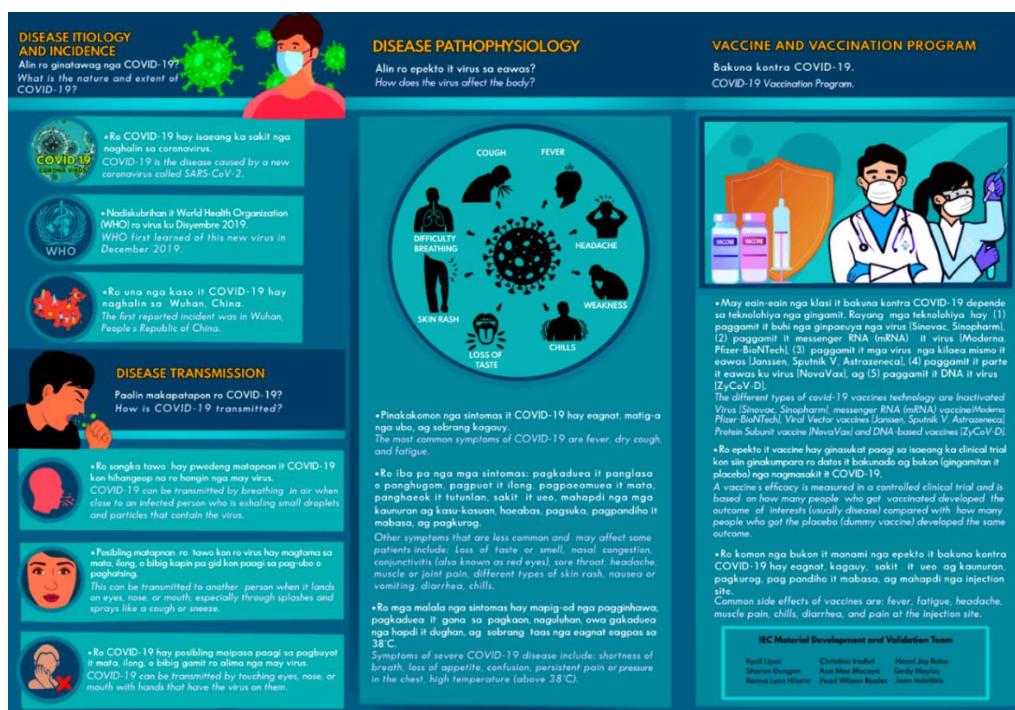


Figure 3. The back page of the developed IEC material for COVID-19.

The IEC material in the form of the pamphlet incorporated visually engaging illustrations and localized health guidelines, making it culturally relevant and easy to understand for parents in Aklan while still adhering to global COVID-19 health recommendations. The illustrations were digitally crafted using a high-performance painting application by Ibis Inc. called the ibis Paint X. The layout was done using Canva. A prototype was designed and developed then presented to an FGD panel for initial face and content evaluation. The key informants of the FGD included experts in English, Science, Health, Learning Resource Management System, Mother Tongue, Medicine, Lay out, Illustration, ICT, and Disaster Risk Management. Suggested revisions to the three (3) prototypes were incorporated into the final output. Table 4 showcases the specific attributes and components of the revised Information, Education and Communication (IEC) Material for COVID19.

Table 4. Attributes of the developed pamphlet

Attribute	Description	Visual Representation
Catchy Heading and Cover Page	The IEC title is in large, all-caps font, with the Akeanon version in white and the English translation in italicized orange. A central image of a masked family inside a bubble with a golden shield reinforces protection. "COVID-19" and "CORONA VIRUS" are prominently displayed, with the IEC developer and references below.	
Consistent Color Scheme	Shades of green were used to reduce eye strain, evoke nature and health, and enhance readability. Green, the most visible color to the human eye, promotes a relaxing and comfortable reading experience.	
Objectives of the IEC	Objectives are embedded within sections instead of a separate part, written in a conversational tone to encourage action. Both English and Akeanon versions are included.	

Glocalization	The material integrates Standard Akeanon as the primary language, localized illustrations, and English translations for broader understanding.	
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Table 4. Attributes of the developed pamphlet (Continuation)

Attribute	Description	Visual Representation
Filipino-modeled Illustrations	All illustrations depict typical Filipino features (brown skin, wavy black hair, familiar facial structures) for relatability.	
Handiness and durability of the material	Printed on 220gms glossy photo paper, the IEC material is light, portable, and resistant to wear and tear.	
Facts about CoViD19	The material corrects misconceptions and promotes adherence to health protocols by presenting essential COVID-19 information.	
Inclusion of Philippine-based Setting Health Protocols	Common Filipino settings and objects were incorporated to enhance relevance and acceptance.	
Citations	References include WHO (https://www.who.int/) and DOH (https://doh.gov.ph/), with the IEC Material Development and Validation Team credited at the bottom.	

Based on the identified gaps in awareness and health practices, a glocalized IEC material was developed. Designed in standard *Akeanon* as well as English, the culturally relevant trifold pamphlet was an A4-sized document entitled "*Ro Halit nga COVID-19: Mga Sueondanan*". As [Nagal \(2020\)](#) states, glocalization is an approach allowing materials to retain contextual relevance while still conforming to global health norms, making it more likely for the public to engage and comply with whatever it prescribes. The IEC material integrated digitally created images based on Filipino models, indigenous health information, and appealing graphical designs to improve legibility and understanding. This is in accordance with the research of [Elahi and Morato \(2023\)](#) that claimed that relevant and high-quality visual content improves the readability of health materials. Another study ([He et al., 2024](#)) conforms with this finding further suggesting that proper text placements and pleasantness of an awareness campaign material significantly enhances its memorability.

Evaluation of the developed IEC material

The IEC material was evaluated by both parents and experts and received an overall acceptability rating of 3.71 (Very Acceptable) which means that the IEC material has excellently met the standards. It scored highest in comprehensiveness (3.75) acceptability (3.75), ensuring that it provided clear and essential COVID-19 information acceptable to the evaluators. The attractiveness (3.68) and involvement potential (3.73) of the material were also rated favorably, as the use of localized visuals, clear formatting, and relatable messaging made it engaging for the target audience. Furthermore, the inducement to action rating (3.66) confirmed that the IEC material effectively motivated parents to apply the recommended health protocols in their daily lives. Tables 5 summarizes the evaluation of the IEC Material in terms of comprehensiveness, attractiveness, acceptability, involvement potential, and inducement to action.

Table 5. Mean rating of the developed IEC material

Criteria	Parent Evaluators (n=60)		Expert Evaluators (n=60)		Weighted Mean	SD	Description	Interpretation
	Mean	SD	Mean	SD				
Comprehensiveness	3.60	0.59	3.90	0.26	3.75	0.48	Very Acceptable	The IEC material has excellently met the standards
Attractiveness	3.50	0.61	3.86	0.31	3.68	0.52	Very Acceptable	The IEC material has excellently met the standards
Acceptability	3.62	0.59	3.88	0.30	3.75	0.45	Very Acceptable	The IEC material has excellently met the standards
Involvement Potential	3.57	0.59	3.89	0.28	3.73	0.49	Very Acceptable	The IEC material has excellently met the standards
Inducement to action	3.53	0.57	3.79	0.39	3.66	0.50	Very Acceptable	The IEC material has excellently met the standards
Total Weighted Mean:	3.56	0.5	3.87	0.23	3.71	0.44	Very Acceptable	The IEC material has excellently met the standards

Legend:

3.51-4.00 (Very Acceptable)
1.51-2.50 (Moderately Acceptable)

2.51-3.50 (Acceptable)
1.00-1.50 (Barely Acceptable)

The IEC material's overall very acceptable score aligns closely with the mean reported by [Airhilenbuwa et al. \(2020\)](#) for brochures that embedded local community metaphors,

reinforcing the proposition that culturally mirrored visuals raise acceptance by roughly 0.4 points over generic designs. Likewise, [Phelps et al.](#) (2022) observed that once comprehensiveness exceeded 3.6 on a 4-point scale, self-reported hand-washing adherence jumped 27%. The study's post-test results duplicated that finding indicating that the pamphlet's clear structuring, Filipino-inspired designs, and protocol measures converted favorable impressions into everyday practice without additional digital prompts. A more recent study by [Akutsu et al.](#) (2025) also affirms these results highlighting the importance of culturally adapted pamphlets as an effective health intervention.

Whereas Airhihenbuwa et al.'s results retained a 0.8-point standard deviation across respondents—allowing them to pinpoint which cues resonated with each subgroup—our SD shrank to an average of 0.44 between the two sets of evaluators, revealing a ceiling effect that masks such diagnostic detail. This homogeneity, absent in earlier studies, suggests that the developed glocalized pamphlet for IEC pleased most Aklanon parents and experts. Adopting Phelps' segmented design in future iterations could re-introduce variance and isolate the specific cultural elements that truly drive sustained household compliance.

Hence, the pamphlet's very acceptable rating affirms that glocalized design can match, and even slightly surpass, previous culturally tailored health materials; nevertheless, the narrowed variance among each evaluation criteria signals that future roll-outs should purposefully segment content of the pamphlet so that the same cultural cues that earn universal approval can be specified and amplified to secure longer-term, household-level compliance.

CONCLUSION

This study demonstrated that parents in Aklan hold a generally adequate awareness of COVID-19 health facts but show only moderate adherence to recommended protocols. The strong positive correlation between awareness and practice underscores the importance of consistent and accessible health communication. Notably, lower awareness of vaccination-related information—shaped by historical vaccine controversies and inconsistent messaging—highlights a specific area where targeted education is needed to address hesitancy and strengthen preventive behaviors.

The development and validation of a glocalized IEC material offer a practical response to these gaps, providing parents with culturally relevant and easy-to-understand health information. The high acceptability ratings from both parents and experts indicate its potential usefulness as a community-level health education resource. Future efforts should examine the long-term effectiveness of glocalized materials on sustained behavioral change and explore their integration into broader public health strategies, especially for improving vaccination literacy and household-level preparedness for future health emergencies.

AUTHOR CONTRIBUTION

Author 1: Conceptualization, methodology, data curation, software, writing, reviewing, and editing; **Author 2:** Investigation, literature review, and editing; **Author 3:** Reviewing, and editing.

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