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Enhancing household iodized salt practices through contextual health education: An intervention study in rural Jeneponto, Indonesia

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ABSTRACT

Iodine deficiency remains a significant nutritional issue in Indonesia, particularly affecting rural communities with limited access to accurate health information. This research-based community engagement aimed to evaluate the effectiveness of an educational intervention on household knowledge and practices related to iodized salt usage in Bontobakka Hamlet, Jeneponto Regency. The intervention employed a door-to-door campaign using poster media and involved 31 female respondents who were assessed at three time points: pre-intervention, post-intervention, and six months post-intervention. The study utilized a summative evaluative approach based on the CIPP model (Context, Input, Process, Product) to measure program impact. The Friedman test revealed a statistically significant improvement in knowledge levels (p = 0.028), with 87.1% of participants achieving a "good" knowledge score at the final assessment. Integration of religious values through Q.S. Al-Baqarah: 168 enhanced community acceptance, demonstrating the importance of culturally sensitive messaging. The findings underscore the value of combining visual, contextual, and faith-based strategies to promote iodized salt consumption and address Iodine Deficiency Disorders (IDD) in rural Indonesia.

ABSTRAK

Kekurangan yodium masih menjadi masalah gizi yang signifikan di Indonesia, terutama yang mempengaruhi masyarakat pedesaan yang memiliki akses terbatas terhadap informasi kesehatan yang akurat. Pelibatan masyarakat berbasis penelitian ini bertujuan untuk mengevaluasi efektivitas intervensi edukasi terhadap pengetahuan dan praktik rumah tangga terkait penggunaan garam beryodium di Dusun Bontobakka, Kabupaten Jeneponto. Intervensi yang dilakukan adalah kampanye dari rumah ke rumah dengan menggunakan media poster dan melibatkan 31 responden perempuan yang dinilai pada tiga titik waktu: sebelum intervensi, setelah intervensi, dan enam bulan setelah intervensi. Penelitian ini menggunakan pendekatan evaluatif sumatif berdasarkan model CIPP (Context, Input, Process, Product) untuk mengukur dampak program. Uji Friedman menunjukkan adanya peningkatan yang signifikan secara statistik pada tingkat pengetahuan (p = 0,028), dengan 87,1% peserta mencapai skor pengetahuan "baik" pada penilaian akhir. Integrasi nilai-nilai agama melalui Q.S. Al-Baqarah: 168 meningkatkan penerimaan masyarakat, menunjukkan pentingnya pesan yang peka terhadap budaya. Temuan ini menggarisbawahi pentingnya menggabungkan strategi visual, kontekstual, dan berbasis agama untuk mempromosikan konsumsi garam beriodium dan mengatasi Gangguan Akibat Kekurangan Yodium (GAKY) di daerah perdesaan di Indonesia.

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INTRODUCTION

Iodine deficiency remains one of the major public health concerns in Indonesia, significantly impacting the cognitive and physical development of vulnerable populations such as pregnant women, infants, and children (Damanik, 2019; Kusmita & Mandagi, 2021). Thyroid hormones, which rely on sufficient iodine intake, play a vital role in regulating metabolism and neurological development. When deficiency occurs during critical periods such as pregnancy, it can result in severe and irreversible consequences including congenital hypothyroidism, miscarriage, and mental retardation (Nurjaya et al., 2019). Despite the implementation of the Universal Salt Iodization (USI) policy aimed at addressing this issue, disparities in iodized salt consumption persist across Indonesia. According to the 2023 Indonesian Health Survey (SKI), household consumption of iodized salt has yet to meet the national coverage target.

In South Sulawesi, particularly Jeneponto Regency, iodine deficiency continues to be a persistent issue. Riskesdas 2018 reported that only 77.1% of households used adequately iodized salt, while the remainder either consumed substandard iodized salt or did not consume iodized salt at all (Balitbangkes, 2018). Data collected during the 2024 Community-Based Learning (PBL) I program by UIN Alauddin Makassar in Bontobakka Hamlet further highlighted the extent of the problem: 52.9% of households did not use iodized salt, 9.8% used inadequately iodized salt, and only 37% met the required standard. These figures emphasize the critical need for targeted public health interventions to increase awareness and encourage the adoption of iodized salt in daily household use.

The persistent low coverage of adequately iodized salt usage in rural areas like Bontobakka Hamlet underscores a fundamental gap in public knowledge and behavior concerning iodine deficiency prevention. Despite the existence of the USI program, its implementation remains suboptimal at the household level due to limited awareness and access to accurate information (Ministry of Health RI, 2019). Therefore, targeted health education and outreach initiatives are essential to bridge this gap by enhancing community knowledge and promoting behavioral change (Nurhayati et al., 2021).

Direct educational interventions have been recognized as effective strategies in modifying health-related behaviors at the community level. Nurhayati et al. (2021) emphasize the role of face-to-face education in facilitating knowledge transfer and behavioral change. Educational outreach, especially when delivered in culturally appropriate and accessible formats, helps raise awareness about the benefits and correct usage of iodized salt. Syahraini (2020) and Tasya Indriana (2021) also found that increased knowledge levels among housewives directly influence their choices regarding iodized salt usage, demonstrating that knowledge improvement is a key determinant in household nutritional practices.

The use of visual aids such as posters and personal engagement through door-to-door visits has proven effective in previous community-based nutrition interventions. These methods not only convey important health messages but also foster trust and interpersonal communication between educators and community members. Implementing a localized educational approach, such as that adopted in Bontobakka Hamlet, aligns with best practices in public health promotion and enables more effective message retention and community participation.

While national policies like the USI program have laid the groundwork for iodine deficiency prevention, the lack of tailored interventions at the micro-level continues to limit their effectiveness in rural settings. Most previous studies have focused on regional or national data trends without exploring community-specific barriers to iodized salt consumption (Damanik, 2019; Balitbangkes, 2018). The literature highlights the importance of education, yet there remains a gap in evaluating the impact of direct, community-level interventions on knowledge and behavioral outcomes.

This study addresses this gap by implementing and assessing a structured educational intervention in Bontobakka Hamlet, where iodized salt consumption is critically low. By using a door-to-door approach supported by visual materials, this initiative introduces a novel, context-sensitive model of public health education. The objective of this study is to evaluate the effectiveness of this intervention in increasing household knowledge and promoting proper iodized salt usage in a rural

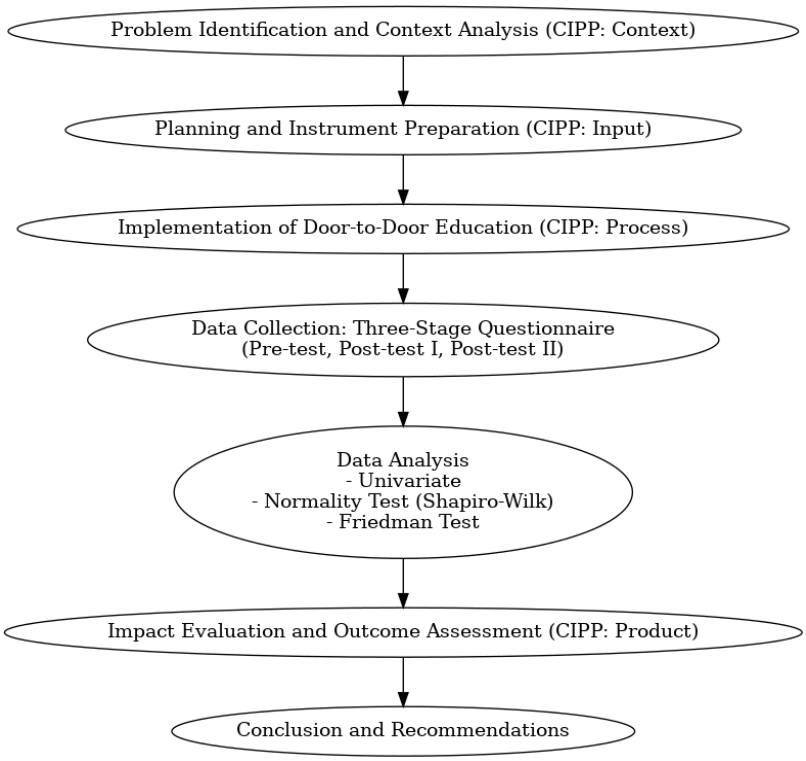
Indonesian setting.

METHODS

This study adopted an evaluative research design using the CIPP model (Context, Input, Process, Product) developed by Stufflebeam, which is extensively employed to assess the effectiveness of intervention programs. The model provided a structured framework to evaluate community needs, intervention resources and planning, activity implementation, and the outcomes or impacts of the educational intervention on iodized salt usage in Bontobakka Hamlet, Rumbia Subdistrict, Jeneponto Regency.

The study was conducted over a six-month period in 2024, involving 31 housewives residing permanently in Bontobakka Hamlet, who voluntarily consented to participate throughout the entire intervention process. The educational activity focused on delivering information regarding iodine deficiency, the benefits of iodized salt, and appropriate storage and usage techniques. The intervention was implemented using a door-to-door approach supported by poster media, aiming to enhance participation and comprehension at the household level. The flow of the research-based community engagement activity is illustrated in Figure 1.

Figure 1
Flowchart of Research-Based Community Engagement Methodology



Data collection employed a structured questionnaire containing 10 items aligned with the intervention themes. Each correct answer was assigned a score of 10, with the maximum total score being 100. Knowledge scores were categorized into two levels: Poor (<70) and Good (≥70). The questionnaire was administered at three different stages—pre-test (before the intervention), post-test I (immediately after the intervention), and post-test II (six months after the intervention)—to evaluate longitudinal changes in knowledge.

Demographic data were analyzed using univariate analysis to determine frequencies and

percentages. Given the small sample size (<50), the Shapiro-Wilk test was used to assess data normality, which indicated a non-normal distribution. Consequently, the Friedman test was applied for bivariate analysis to detect statistically significant differences in knowledge levels across the three time points.

Ethical procedures were rigorously followed throughout the study. Formal approval for the activity was obtained from the local village administration, and informed verbal consent was secured from all participants prior to data collection.

RESULTS AND DISCUSSION

The community service activity was carried out from April 28 to May 2, 2025, in Bontobakka Hamlet, Pallantikang Village, Rumbia Subdistrict, Jeneponto Regency. This activity focused on evaluating a public health intervention program that was initially implemented in October 2024 and followed up with a second phase in April 2025 in the form of an iodized salt education initiative. The purpose of this education program was to increase the knowledge and awareness of the community—particularly among housewives—regarding the importance of iodized salt consumption as a preventive measure against Iodine Deficiency Disorders (IDD).

This intervention aligned with the national policy goal of eliminating IDD by encouraging iodized salt consumption across all segments of the population. Bontobakka Hamlet is classified as a region with low public awareness about micronutrient nutrition, including iodine, a condition often influenced by social factors such as educational attainment and economic status.

Table 1
Characteristics of Respondents

Respondent Criteria	Number (n = 31)	Percentage (%)
Gender		
Male	0	0
Female	31	100
Age		
< 19 years	4	12.9
20–35 years	8	25.8
> 35 years	19	61.3
Education Level		
No formal education	7	22.6
Did not complete elementary	4	12.9
Completed elementary (SD/MI)	9	29
Completed junior high (SLTP)	6	19.4
Completed senior high (SLTA)	3	9.7
Higher education	2	6.4

Table 1 shows that all respondents were female. The majority (61.3%) were over 35 years old, and the most common education level was completion of elementary school (29%). Only 6.4% had attained higher education.

Table 2 illustrates the Friedman test showed a statistically significant difference between the pre-test, post-test I, and post-test II results ($p = 0.028 < 0.05$), indicating a meaningful improvement in knowledge following the intervention. The average knowledge score increased from 6.51 (SD = 1.34) in the pre-test to 7.16 (SD = 1.53) in post-test I, and further to 7.74 (SD = 1.34) in post-test II. This progressive increase illustrates the effectiveness of the educational program in enhancing community understanding of the importance of iodized salt.

Table 2
Respondents' Knowledge Before and After the Intervention

Knowledge Level	Pre-Test	Post-Test I	Post-Test II	Friedman Test (p)
Poor	14 (45.2%)	11 (35.5%)	4 (12.9%)	0.028
Good	17 (54.8%)	20 (64.5%)	27 (87.1%)	

Analysis of response distribution showed that the question with the highest error rate was Q5, which asked about the appropriate iodine content in salt—16 respondents answered this incorrectly. In contrast, Q7 and Q10, which addressed the characteristics of iodized salt and the role of families in iodized salt consumption, were correctly answered by all respondents. Q4, which questioned the health importance of iodized salt, was still incorrectly answered by 10 respondents. These results suggest persistent misconceptions about the technical aspects of iodine content and usage. Misperceptions, long-standing habits, and limited access to health information remain significant barriers.

This evaluation confirms that the iodized salt education program in Bontobakka Hamlet significantly improved housewives' knowledge regarding the importance of iodized salt use. This was evident in the improved scores from pre-test to post-test II ($p = 0.028$), reinforcing the success of the intervention.

These findings are consistent with the work of Rasikawati et al. (2020), which demonstrated that hands-on educational methods such as salt testing and taste testing can effectively raise community awareness on iodized salt use. Similarly, Nurhayati et al. (2021) highlighted that repeated education using literacy-appropriate media successfully boosts knowledge and willingness to adopt healthier consumption practices. Syahraini (2020) also found a positive correlation between educational attainment and correct iodized salt usage. Given that the majority of respondents in this study had low educational levels, the use of simple, contextual, and repetitive educational approaches was a key factor in the intervention's success.

Further support for these findings comes from Alam and Adnan (2021), who emphasized that consumption behavior and educational background of women of reproductive age are closely linked to household health outcomes, including iodized salt use. Alam (2023) further noted that locally tailored interventions—particularly those targeting rural populations such as farmers in Jeneponto—should reflect local social characteristics and daily habits. This aligns well with the strategy of this study, which applied a door-to-door approach to directly engage the target group.

In a more recent study, Alam et al. (2024) observed that the success of chronic disease management programs in rural areas heavily depends on the engagement of local health cadres and community-based participatory approaches. These principles were also evident in this iodized salt education program, which was strengthened by collaboration between the engagement team, community health workers, and village authorities.

Unlike earlier studies that primarily assessed short-term outcomes, this community engagement assessed knowledge retention over a six-month period. The findings demonstrated strong knowledge sustainability, underscoring the effectiveness of the personalized, door-to-door community approach that directly addressed household life.

Moreover, this program offered added value by integrating health education with religious values—a highly relevant approach in the sociocultural context of religious rural communities like Bontobakka. The inclusion of messages framed within religious teachings, such as the verse from Q.S. Al-Baqarah: 168 provided spiritual and moral reinforcement that strengthened motivation to adopt healthier practices. This integration helped ensure that health messages were more easily accepted, internalized, and practiced by a community that places high importance on religious values in daily life.

Interviews revealed that some families still use coarse salt lacking iodine, believing that iodized salt is unnecessary. This belief is largely shaped by economic constraints and lack of exposure to accurate health information. Despite these challenges, the program benefitted from strong support from village officials, active community participation, and the involvement of the monitoring and evaluation team. Additionally, the Rumbia Health Center routinely conducts salt testing during Posyandu activities, creating a valuable opportunity for future collaboration and intervention

sustainability.

CONCLUSION

The community-based educational intervention implemented in Bontobakka Hamlet, Rumbia Subdistrict, Jeneponto Regency successfully demonstrated that a door-to-door communication strategy using poster media significantly enhanced household knowledge regarding iodized salt. The statistically significant findings from the Friedman test ($p = 0.028$) confirm that the improvements in knowledge were not only immediate but sustained over a six-month period, affirming the effectiveness of personalized, visual health communication in rural settings.

The study's findings suggest that the intervention model is both contextually relevant and replicable. Future programs should be institutionalized through existing community structures such as posyandu, Quranic study groups, and PKK activities, with the support of local health workers and authorities to ensure long-term impact and sustainability. To enhance reach and comprehension, educational materials should include more practical and visual formats, such as live demonstrations and video tutorials.

While the intervention proved effective, limitations include the small sample size and its focus on a single rural hamlet, which may limit generalizability. Future research should involve larger, more diverse populations and explore longitudinal impacts beyond six months. Strengthening collaborations with local health centers will be vital to ensure routine monitoring and reinforce community-level iodine deficiency prevention efforts

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