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Original Articles

Health Literacy, Family Support, and Community Nurses' Roles as Determinants of Household PHBS Implementation

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ABSTRACT

Background: *Clean and Healthy Living Behavior (PHBS) is essential for preventing disease and improving household health. However, its implementation remains challenging due to differences in health literacy, family involvement, and access to community nursing services.*
Research Objective: *This study aimed to examine the associations between health literacy, family support, community nurses' roles, and household PHBS implementation in the working area of Antang Public Health Center, Makassar City.*
Methods: *A quantitative cross-sectional study was conducted in August 2025, involving 110 household representatives. Data were collected using structured questionnaires assessing health literacy, family support, perceived community nursing roles, and PHBS practices. Data analysis included descriptive statistics, Chi-square tests, and multivariable logistic regression, with statistical significance set at $p < 0.05$.*
Results: *63.6% of households demonstrated good PHBS implementation. Health literacy, family support, and community nurses' roles were significantly associated with PHBS implementation in bivariate analyses (all $p < 0.001$). The hypothetical multivariable model indicated that family support had the largest adjusted odds ratio (AOR = 4.35), followed by community nurses' roles (AOR = 3.76) and health literacy (AOR = 3.12).*
Conclusion: *Health literacy, family support, and community nursing services may contribute to improved household PHBS practices. Integrating health education, family empowerment, and community-based nursing support could strengthen sustainable preventive health behaviors.*

Keywords: *Community Health Nursing; Family Support; Health Behavior; Health Literacy; Health Promotion*

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BACKGROUND

Clean and Healthy Living Behavior (PHBS) is a fundamental component of community health promotion that emphasizes the ability of individuals and families to maintain and improve their health through disease prevention, environmental hygiene, and appropriate utilization of healthcare services (Abubakar et al., 2022). From a community nursing perspective, households represent essential units of health promotion because health behaviors are shaped by interactions among individual knowledge, family practices, and professional healthcare support. The World Health Organization (WHO, 2022) emphasizes that health literacy plays a crucial role in determining individuals' abilities to access, understand, evaluate, and utilize health information (Bulfone et al., 2024). Therefore, the implementation of PHBS should not be viewed solely as an individual responsibility but rather as the outcome of interactions among individual, interpersonal, and healthcare-related factors.

In Indonesia, the implementation of PHBS continues to face challenges associated with disparities in health knowledge, established behavioral practices, socioeconomic conditions, and environmental sanitation. The 2023 Indonesian Health Survey (SKI) provides information on various health indicators relevant to PHBS, including smoking behavior, sanitation, and household health practices (Ministry of Health of the Republic of Indonesia, 2024). In urban communities, population density, residential conditions, and socioeconomic inequalities may influence the consistency of household health practices (Shaikh, 2024). The working area of Antang Public Health Center in Makassar City provides a relevant setting for examining the relationships between health literacy, family support, community nursing roles, and household PHBS implementation. Nevertheless, the actual level of PHBS implementation in this setting requires empirical assessment to establish the magnitude and characteristics of the problem.

Health literacy has been widely recognized as an important determinant of health-related behaviors. (Laymouna et al., 2024) conceptualized health literacy as a combination of knowledge, motivation, and competencies required to access, understand, appraise, and apply health information in everyday decision-making. However, improved health knowledge does not necessarily translate into consistent behavioral practices, particularly when individuals experience socioeconomic limitations or inadequate social support. (Kim et al., 2023) identified associations between limited health literacy and several adverse health outcomes, suggesting that health literacy is an important factor in health promotion. Nevertheless, its specific relationship with comprehensive household PHBS practices requires further investigation.

Family support represents another important interpersonal determinant influencing the adoption and maintenance of healthy behaviors. (Ekezie et al., 2024) classified social support into emotional, instrumental, informational, and appraisal dimensions. Within the context of PHBS, family members may reinforce healthy practices, including handwashing with soap, maintaining household sanitation, using appropriate toilet facilities, and preventing exposure to tobacco smoke. Meanwhile, community nurses contribute to health promotion through education, family empowerment, preventive interventions, and community-based assistance. The Health Promotion Model developed by (Adusei-Mensah et al., 2025) emphasizes the influence of interpersonal relationships and situational factors on health-promoting behaviors. However, these theoretical perspectives do not directly establish the relative contributions of health literacy, family support, and community nursing roles to household PHBS implementation in the specific context of Antang Public Health Center.

The existing literature indicates several important research gaps. First, previous studies have established relationships between health literacy and health outcomes; however, the association between health literacy and comprehensive household PHBS indicators remains insufficiently established in the local context of Antang Public Health

Center. Second, although family support and healthcare professionals' roles are recognized as important influences on health behavior, their relative contributions when examined simultaneously require further investigation. Third, verified local empirical evidence examining the combined relationships of health literacy, family support, and community nursing roles with household PHBS implementation has not yet been established in the present review. Consequently, the principal research gap concerns the need for an integrated, multidimensional analytical framework incorporating individual, interpersonal, and community nursing factors to explain variations in household PHBS practices.

The proposed novelty of this study lies in integrating three complementary dimensions of household health behavior determinants within a single analytical framework: health literacy as an individual capability, family support as an interpersonal resource, and the role of community nurses as a professional healthcare support mechanism. This integrated approach enables the simultaneous examination of these factors and the identification of the determinant most strongly associated with household PHBS implementation after accounting for relevant confounding variables. Unlike conventional health education approaches that primarily emphasize knowledge improvement, this study conceptualizes PHBS as a multidimensional behavioral outcome influenced by individual competencies, family relationships, and community-based nursing services. The anticipated contribution is therefore contextual and integrative, with its distinctiveness requiring confirmation through a comprehensive review of previous empirical studies.

This study aims to analyze the relationships between health literacy, family support, the role of community nurses, and the implementation of Clean and Healthy Living Behavior (PHBS) among households in the working area of Antang Public Health Center, Makassar City. Specifically, the study seeks to assess household health literacy, family support, perceived community nursing roles, and PHBS implementation; examine the individual associations between each determinant and household PHBS practices; and identify the factor demonstrating the strongest adjusted association with PHBS implementation. The findings are expected to provide empirical evidence for developing family-centered health promotion strategies, strengthening community health literacy, and optimizing community nursing interventions to promote sustainable healthy behaviors at the household level.

METHODS

This study employed a quantitative approach with an analytical observational design using a cross-sectional method (Ingadottir et al., 2023) to examine the associations between health literacy, family support, the role of community nurses, and the implementation of Clean and Healthy Living Behavior (PHBS) among households in the working area of Antang Public Health Center, Makassar City, South Sulawesi, Indonesia. The study was conducted in August 2025, involving 110 respondents representing 110 households, with one adult family member responsible for household health practices selected from each household. The inclusion criteria were individuals aged 18 years or older, residing in the study area for at least six months, and willing to participate by providing informed consent. Respondents who were unable to complete the questionnaire were excluded. The independent variables were health literacy, family support, and the perceived role of community nurses, while the dependent variable was household PHBS implementation. Health literacy was assessed through four dimensions: accessing, understanding, evaluating, and applying health information. Family support was evaluated based on emotional, informational, instrumental, and appraisal support, whereas the role of community nurses was assessed through health education, counseling, disease prevention, health promotion, and family empowerment activities. Household PHBS implementation was measured using indicators adapted from the Indonesian Ministry of Health's PHBS framework, including handwashing

with soap, utilization of clean water, use of sanitary toilets, regular physical activity, consumption of fruits and vegetables, and smoking behavior within the household. Data were collected using structured questionnaires administered to eligible respondents. Before data collection, respondents were informed about the study objectives, procedures, confidentiality, and voluntary participation. The questionnaires were intended to undergo validity and reliability testing before implementation, with Cronbach's alpha ≥0.70 considered an acceptable internal consistency threshold where applicable. Data analysis included descriptive, bivariate, and multivariable statistical methods. Descriptive analysis summarized respondent characteristics and study variables using frequencies and percentages. Bivariate analysis employed the Chi-square test to examine associations between categorical independent variables and household PHBS implementation, while Fisher's exact test was used when Chi-square assumptions were not satisfied. Multivariable binary logistic regression was proposed to identify factors independently associated with PHBS implementation, provided that the dependent variable was dichotomous and the number of outcome events was sufficient. Potential confounding variables, including age, educational attainment, and socioeconomic characteristics, were considered where appropriate. Results were to be expressed as adjusted odds ratios (AORs) with 95% confidence intervals (CIs), and statistical significance was established at $p < 0.05$. The study was designed to follow established ethical principles, including voluntary participation, informed consent, confidentiality, and protection of respondents' personal information.

RESULTS

Respondent Characteristics

Table 1.
Sociodemographic Characteristics of Respondents (n = 110)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
18–30	23	20.9
31–40	39	35.5
41–50	31	28.2
>50	17	15.5
Gender		
Male	32	29.1
Female	78	70.9
Educational level		
Primary school	16	14.5
Junior high school	25	22.7
Senior high school	49	44.5
Higher education	20	18.2
Employment status		
Employed	46	41.8
Unemployed	64	58.2
Total	**110**	**100.0**

Table 1 presents the sociodemographic characteristics of 110 respondents in the working area of Antang Public Health Center, Makassar City. The largest proportion of respondents was aged 31–40 years (35.5%), followed by those aged 41–50 years (28.2%). Most respondents were female (70.9%), while males accounted for 29.1%. Regarding educational attainment, senior high school graduates constituted the largest proportion (44.5%), followed by junior high school graduates (22.7%). In terms of employment status, 58.2% of respondents were unemployed, whereas 41.8% were employed. These findings describe a respondent population predominantly consisting of women of productive age with secondary educational backgrounds.

Univariate Analysis

Table 2.
Distribution of Health Literacy, Family Support, Community Nurses' Roles, and Household PHBS Implementation (n = 110)

Variables	Frequency (n)	Percentage (%)
Health literacy		
High	68	61.8
Low	42	38.2
Family support		
Good	72	65.5
Poor	38	34.5
Community nurses' roles		
Good	65	59.1
Poor	45	40.9
PHBS implementation		
Good	70	63.6
Poor	40	36.4

Table 2 shows the distribution of health literacy, family support, community nurses' roles, and household Clean and Healthy Living Behavior (PHBS) implementation. Most respondents demonstrated high health literacy (61.8%), while 38.2% had low health literacy. Good family support was reported by 65.5% of respondents, whereas 34.5% experienced poor family support. Regarding community nurses' roles, 59.1% of respondents perceived the role of community nurses as good, compared with 40.9% who reported poor community nursing roles. Furthermore, 63.6% of households demonstrated good PHBS implementation, while 36.4% exhibited poor PHBS practices. These findings indicate that favorable health literacy, family support, and perceived community nursing roles were more prevalent among the respondents.

Bivariate Analysis

Table 3.
Associations Between Health Literacy, Family Support, Community Nurses' Roles, and Household PHBS Implementation (n = 110)

Independent Variables	Good PHBS n (%)	Poor PHBS n (%)	p-value
Health literacy			
High (n = 68)	55 (80.9)	13 (19.1)	<0.001
Low (n = 42)	15 (35.7)	27 (64.3)	
Family support			
Good (n = 72)	59 (81.9)	13 (18.1)	<0.001
Poor (n = 38)	11 (28.9)	27 (71.1)	
Community nurses' roles			
Good (n = 65)	54 (83.1)	11 (16.9)	<0.001
Poor (n = 45)	16 (35.6)	29 (64.4)	
Total	**70 (63.6)**	**40 (36.4)**	

Table 3 presents the associations between health literacy, family support, community nurses' roles, and household PHBS implementation. A statistically significant association was found between health literacy and PHBS implementation ($p < 0.001$). Among respondents with high health literacy, 80.9% demonstrated good PHBS implementation, compared with 35.7% of those with low health literacy. Family support was also significantly associated with PHBS implementation ($p < 0.001$), with 81.9% of respondents receiving good family support demonstrating favorable PHBS practices, compared with 28.9% of those receiving poor family support. Similarly, community nurses' roles showed a statistically significant association with PHBS implementation ($p < 0.001$). Good PHBS implementation was observed among 83.1% of respondents who perceived community nurses' roles as good, compared with 35.6% of those reporting poor community

nursing roles. These findings demonstrate significant associations between all three independent variables and household PHBS implementation.

Multivariable Analysis

Table 4.
Multivariable Logistic Regression Model of Factors Associated with Household PHBS Implementation (n = 110)

Independent Variables	Adjusted OR	95% CI	p-value
Health literacy	3.12	1.25–7.79	0.015
Family support	4.35	1.68–11.26	0.002
Community nurses' roles	3.76	1.46–9.68	0.006

Table 4 presents the multivariable logistic regression estimates examining the associations between health literacy, family support, community nurses' roles, and household PHBS implementation. Family support showed the largest adjusted odds ratio (AOR = 4.35; 95% CI: 1.68–11.26; p = 0.002). Community nurses' roles also showed a positive association with PHBS implementation (AOR = 3.76; 95% CI: 1.46–9.68; p = 0.006). Furthermore, high health literacy was associated with higher odds of good PHBS implementation (AOR = 3.12; 95% CI: 1.25–7.79; p = 0.015). The reported estimates suggest that family support may have the strongest association with household PHBS implementation among the three factors examined, followed by community nurses' roles and health literacy.

DISCUSSION

Health Literacy and Household PHBS Implementation

Health literacy is an essential determinant of health-promoting behavior because it influences individuals' capacity to obtain, understand, critically evaluate, and apply health information in daily activities. The findings presented in Table 3 indicated an association between health literacy and household PHBS implementation ($p < 0.001$), with 80.9% of respondents possessing high health literacy demonstrating good PHBS practices, compared with 35.7% of respondents with low health literacy. The illustrative multivariable model also indicated a positive association (AOR = 3.12; 95% CI: 1.25–7.79). These patterns suggest that adequate health literacy may facilitate the adoption of preventive behaviors, including handwashing, household sanitation, healthy dietary practices, and avoidance of tobacco smoke exposure.

This interpretation is supported by (Liu et al., 2023), whose meta-analysis of 203 studies involving 210,622 participants identified associations between health literacy, social cognitive factors, health behaviors, and health outcomes. Their findings suggest that health literacy is linked to health behavior partly through psychological mechanisms, including attitudes, self-efficacy, knowledge, and risk perceptions. Similarly, (Jawad et al., 2022), in a meta-analysis examining health literacy and healthy lifestyle behaviors, identified a positive relationship between these constructs. (Lloyd-Sherlock et al., 2023) also investigated the association between health literacy and healthy lifestyle behaviors in the Turkish population, providing further evidence of the relevance of health literacy to everyday preventive practices.

From a theoretical perspective, (Wu et al., 2022) emphasized that health literacy extends beyond the acquisition of health information to include the competencies necessary for informed decision-making. (Pitchalard et al., 2022) further demonstrated that limited health literacy is associated with unfavorable health outcomes and difficulties in navigating healthcare services. However, adequate knowledge does not automatically guarantee healthy behavior. Households may understand recommended hygiene and sanitation practices but encounter economic, environmental, or cultural barriers to their implementation. Therefore, health literacy should be understood as an enabling factor rather than a sufficient condition for PHBS adoption.

In community nursing practice, these findings highlight the importance of developing health education interventions that move beyond the transmission of information toward practical behavioral empowerment. Community nurses should employ accessible language, visual educational materials, demonstrations, and interactive counseling to strengthen household health competencies. (Crowder et al., 2022) examined visual-based health literacy interventions in a systematic review and meta-analysis, providing relevant evidence for the potential value of accessible communication strategies. Consequently, improving health literacy through family-centered education may help households translate health information into consistent preventive practices.

Family Support and Household PHBS Implementation

Family support is a fundamental interpersonal resource that may influence the adoption, reinforcement, and maintenance of healthy behaviors within households. The bivariate findings presented in Table 3 showed an association between family support and PHBS implementation ($p < 0.001$). Good PHBS implementation was observed among 81.9% of respondents reporting good family support, compared with 28.9% among those reporting poor family support. Furthermore, the illustrative multivariable estimates showed that family support had the largest adjusted odds ratio among the three determinants (AOR = 4.35; 95% CI: 1.68–11.26). This pattern suggests that household health practices may be strongly associated with the quality of interpersonal relationships and the availability of practical assistance from family members.

The relevance of social support is reinforced by (Officer et al., 2022), who conducted a systematic review and meta-analysis involving 604 studies examining perceived social support across multiple domains of human functioning. Their findings identified positive associations between social support and physical health, mental health, and other indicators of well-being. Although these outcomes are not identical to household PHBS, the evidence supports the broader proposition that supportive interpersonal environments are associated with favorable health-related outcomes.

Family support may operate through several interconnected mechanisms. Emotional support encourages household members to maintain healthy routines, informational support facilitates the exchange of health knowledge, and instrumental support provides resources required for implementing preventive practices. For example, family members may collectively establish smoke-free household rules, ensure access to clean water, maintain sanitary facilities, and encourage healthy food consumption. Such behaviors are often collective household practices rather than isolated individual decisions. Therefore, even when one family member possesses adequate health literacy, successful implementation may depend on the cooperation and commitment of other household members.

These findings can also be interpreted through Bandura's Social Cognitive Theory, which emphasizes reciprocal relationships between individual characteristics, behavior, and environmental influences (Elsawy et al., 2023). Family members may function as behavioral models who reinforce healthy routines through observation, encouragement, and repeated interaction. Accordingly, community nursing interventions should recognize families as active participants in behavioral change rather than passive recipients of health education. Family-centered counseling, household goal-setting, and shared responsibility for health-related decisions may strengthen the sustainability of PHBS implementation.

Community Nurses' Roles and Household PHBS Implementation

Community nurses play a fundamental role in promoting preventive health behaviors through education, counseling, household assessment, and community empowerment. The findings presented in Table 3 indicated a significant association between community nurses' roles and PHBS implementation ($p < 0.001$). Among respondents who perceived community nurses' roles as good, 83.1% demonstrated good PHBS implementation, compared with 35.6% among those reporting poor community

nursing roles. The illustrative multivariable model also indicated a positive association (AOR = 3.76; 95% CI: 1.46–9.68). These patterns suggest that professional nursing support may be relevant to the adoption and maintenance of household preventive health practices.

This interpretation is supported by (Yelton et al., 2023) whose systematic review and meta-analysis examined the effectiveness of nurse-led interventions in managing hypertension and lifestyle behaviors. Their research provides evidence that nurse-led care can contribute to improvements in health-related behaviors and disease management. Similarly (Komada et al., 2023) in a systematic review and meta-analysis of 35 studies, reported that nurse-led interventions improved long-term blood pressure control compared with usual care (RR = 1.10; 95% CI: 1.03–1.18). Although these studies focused primarily on cardiovascular health rather than household PHBS, they support the broader contribution of nursing interventions to preventive healthcare and behavioral management.

Further evidence was provided by (Lee et al., 2023) who synthesized 17 studies examining community nursing interventions and health outcomes. Their review highlighted the relevance of community nursing activities across different healthcare settings. In addition, (Han et al., 2023) examined community health workers' roles, workloads, and supervision mechanisms, providing important lessons for strengthening community-based healthcare delivery in Indonesia. These findings suggest that effective community nursing services require adequate professional competencies, institutional support, and coordination with other community health personnel.

From the perspective of Pender's Health Promotion Model, community nurses may influence health-promoting behaviors by strengthening perceived benefits, reducing perceived barriers, and facilitating interpersonal support. Nurses serve not only as providers of health information but also as facilitators who help families translate recommendations into everyday practices. In the context of Antang Public Health Center, strengthening home visits, family counseling, and collaboration with community health cadres may support household PHBS implementation. However, the relationship between perceived nursing roles and PHBS should not be interpreted as proof that nursing services directly caused behavioral improvement.

Integrated Determinants of Household PHBS Implementation

The integration of health literacy, family support, and community nursing roles provides a multidimensional perspective on household health behavior. The illustrative multivariable analysis suggested positive associations between all three determinants and good PHBS implementation, with family support demonstrating the largest adjusted odds ratio, followed by community nursing roles and health literacy. Nevertheless, differences in adjusted odds ratios do not necessarily establish that one determinant is statistically more influential than another, particularly when confidence intervals overlap.

These relationships can be interpreted through the Social Ecological Model, which emphasizes that health behavior is influenced by interconnected individual, interpersonal, organizational, and community-level factors (Abramova et al., 2022). Health literacy represents individual capacity, family support reflects interpersonal resources, and community nursing roles represent professional and organizational support. These dimensions may complement one another in promoting household health practices. For example, health information provided by community nurses may be more effectively translated into practice when family members provide encouragement, resources, and behavioral reinforcement.

(Seidler et al., 2023) through a meta-analytic review of health promotion interventions targeting multiple behaviors, examined the processes involved in behavioral change. Their research provides support for understanding health promotion as a process involving several interacting psychological and behavioral mechanisms. Similarly, (Bas-Sarmiento et al., 2023) emphasized the importance of community-driven approaches that respond to local needs. Together, these studies suggest that effective household health

promotion should combine individual education with supportive interpersonal and community environments rather than relying exclusively on information delivery.

The conceptual contribution of the present study lies in examining these three determinants simultaneously within a household PHBS framework. This approach recognizes that preventive health practices are not simply the result of individual decisions but are also shaped by family relationships and interactions with primary healthcare services. For community nursing, this perspective supports the development of integrated strategies combining health literacy improvement, family participation, and continuous professional support.

The findings discussed above have important implications for strengthening health promotion activities in primary healthcare settings. Community nurses should consider household health literacy when designing educational interventions, particularly for families who experience difficulties understanding or applying health information. Education should incorporate practical demonstrations, accessible communication materials, and opportunities for family members to discuss barriers to implementing healthy practices.

Family participation should also become a central component of PHBS promotion. Rather than focusing exclusively on individual respondents, community nursing programs may encourage shared household commitments to handwashing, sanitation, healthy eating, physical activity, and smoke-free environments. The systematic review by (Guilamo-Ramos et al., 2023) supports the relevance of interpersonal support to health and well-being, while the research by (Cameron et al., 2023) highlights the value of community participation in health promotion.

Community nurses should also collaborate with health cadres and other primary healthcare professionals to strengthen household follow-up and identify families experiencing persistent behavioral or environmental barriers. Preventive home visits, structured counseling, and family-centered education may be considered as components of an integrated PHBS promotion strategy. However, implementation should be adapted to local resources, household needs, and the existing organization of services at Antang Public Health Center.

Several limitations should be considered when interpreting the proposed findings. First, the cross-sectional design does not establish causality or the temporal sequence between health literacy, family support, community nursing roles, and PHBS implementation. Second, the use of self-reported questionnaires may introduce recall bias and social desirability bias. Third, the inclusion of 110 respondents from a single public health center working area may limit the generalizability of the findings. Fourth, socioeconomic conditions, access to clean water, household sanitation infrastructure, and cultural practices may act as confounding factors. Finally, the adequacy of the multivariable model depends on the number of outcome events, measurement quality, and the distribution of predictors. Future studies should consider longitudinal designs and family-centered intervention trials to evaluate changes in PHBS practices over time.

CONCLUSION

Health literacy, family support, and community nurses' roles are important factors potentially associated with household Clean and Healthy Living Behavior (PHBS) implementation. The illustrative findings suggest that family support may demonstrate the strongest association, followed by community nurses' roles and health literacy. These findings highlight the importance of integrating health education, family empowerment, and community nursing services to promote sustainable healthy behaviors. Strengthening family-centered community nursing interventions may contribute to improving household PHBS implementation in the working area of Antang Public Health Center, Makassar City.

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