

Knowledge and Counseling Practices of Public Health and Community Pharmacists on Micronutrients Use Among First- and Second-Trimester Pregnant Women in South Cotabato

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DOI: <https://doi.org/10.47772/IJRISS.2026.100600783>

Received: 11 June 2026; Accepted: 16 June 2026; Published: 06 July 2026

ABSTRACT

Pharmacists play a critical role in maternal healthcare by ensuring the safe and appropriate use of micronutrient supplementation during pregnancy through evidence-based counseling and clinical guidance. This study employed a quantitative cross-sectional design to determine the knowledge and counseling practices of public health and community pharmacists regarding micronutrient use among first- and second-trimester pregnant women in South Cotabato. A total of 103 licensed pharmacists working in Rural Health Unit (RHU) pharmacies and selected community pharmacies participated in the study. The respondents were assessed regarding their demographic profile, level of knowledge of the benefits and risks of micronutrient use, and counseling practices in clinical decision-making, including evidence-based consultation and patient counseling. Inferential analysis was also conducted to determine significant differences in knowledge and practices across age, years of professional experience, and practice setting. The results showed that most respondents were young, early-career pharmacists, predominantly aged 20–29 years (72.8%) with 1–3 years of professional experience (52.4%), and mainly working in community pharmacies (85.4%). The respondents demonstrated a very high level of knowledge regarding both the benefits and risks of micronutrient use during pregnancy. Likewise, their counseling practices were rated high in both clinical decision-making with evidence-based consultation ($M = 3.709$, $SD = 0.372$) and patient counseling ($M = 3.639$, $SD = 0.446$). Inferential results revealed no significant differences in knowledge or practice when grouped by age ($p = .151$) or practice setting ($p = .860$). In contrast, a significant difference was found by years of professional experience ($p = .023$). The findings indicate that pharmacists possess strong and well-balanced knowledge and demonstrate competent counseling practices regarding micronutrient use during pregnancy. However, professional experience significantly influences practice levels, suggesting that experiential learning plays an important role in enhancing counseling competence. It is recommended that structured mentorship programs, targeted continuing professional development activities, and strengthened pharmacy education be implemented to enhance counseling skills further and ensure consistent, evidence-based maternal care across practice settings.

Keywords: Micronutrients; Pregnancy; Public Health Pharmacists; Community Pharmacists; Knowledge; Counseling Practices

INTRODUCTION

Background of the Study

Malnutrition remains a major public health concern in many developing countries, including the Philippines, where micronutrient deficiencies continue to significantly contribute to maternal and child morbidity and mortality. Beyond its direct health effects, malnutrition imposes substantial social and economic burdens on families and the healthcare system. Additionally, nearly 2 in 10 pregnant Filipino women are nutritionally at risk, lacking sufficient calories and essential micronutrients to support healthy fetal development (UNICEF

Philippines, 2024). According to the Department of Science and Technology–Food and Nutrition Research Institute (DOST-FNRI, 2024), the under-five mortality rate in the Philippines remains at 26 per 1,000 live births, with higher rates reaching 28 per 1,000 in regions such as the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM), where maternal malnutrition is more prevalent. Nearly half (47%–50%) of under-five deaths occur during the neonatal period, primarily due to preterm birth and low birth weight conditions strongly associated with maternal micronutrient deficiencies. Felipe-Dimog et al. (2021) identified two major contributing factors to these deficiencies: (1) inadequate iron and folic acid supplementation (IFAS) intake, largely due to healthcare providers' limited capacity to effectively motivate and counsel pregnant women, often resulting from insufficient awareness of the consequences of low compliance; and (2) inconsistent IFAS supply due to economic and logistical constraints affecting the availability of supplements in health facilities.

Patient-centered care is an essential component of antenatal services, emphasizing individualized and evidence-based support for pregnant women (Truong et al., 2019). Community pharmacists play a strategic role in this approach, as they are often the first point of contact for over-the-counter medications and basic health advice. Their accessibility allows them to promote the safe and appropriate use of medicines during preconception, pregnancy, and lactation through counseling, provision of accurate information, and the development of trusting patient relationships (Algarni et al., 2022). Antenatal care requires healthcare professionals to consider biological, social, and cultural factors influencing maternal health (Anon, 2020). Nutrition education and counseling (NEC) is a well-established intervention that promotes balanced diets and adequate micronutrient intake, with evidence showing improvements in nutrition knowledge and dietary practices among pregnant women, particularly adolescents. Pharmacists can contribute to these efforts by providing counseling, supporting medication adherence, and recommending essential prenatal supplements such as folic acid, iron, calcium, and vitamin D. However, despite existing guidelines, gaps in counseling persist, especially in rural and underserved areas (UNICEF, 2021). A study conducted in Cebu City reported that 20.23% of pharmacists did not provide counseling, while 8.17% reported low confidence in patient interactions (Kriza et al., 2023). Strengthening pharmacist training, continuing professional development, and access to clinical guidelines can enhance their role in antenatal care and ultimately improve maternal and neonatal health outcomes (Jarab et al., 2025).

Statement of the Problem

Generally, this study aimed to determine the knowledge and counseling practices of public health and community pharmacists regarding micronutrient use among first- and second-trimester pregnant women in South Cotabato. Specifically, this study sought to answer the following questions: (1) What is the demographic profile of the respondents in terms of: Age; Years of professional experience; and Practice setting? (2) What is the level of knowledge of public health and community pharmacists regarding recommended micronutrient use during pregnancy in terms of: Benefits of micronutrients; and Risks of micronutrients? (3) What is the level of counseling practice of public health and community pharmacists regarding recommended micronutrient use during pregnancy in terms of: Clinical decision-making and evidence-based consultation practices; and Patient counseling practices on the risks and benefits of micronutrient use? (4) Is there a significant difference in the knowledge and counseling practices of public health and community pharmacists regarding recommended micronutrient use during pregnancy when grouped according to age, years of professional experience, and practice setting.

METHODOLOGY

Research Design

This study utilized a quantitative cross-sectional research design to assess the knowledge and counseling practices of community and rural health pharmacists regarding micronutrient use among first- and second-trimester pregnant women. According to Creswell and Creswell (2018), quantitative research uses numerical data and statistical analysis to examine variables, while cross-sectional research collects data at a single point in time to describe existing conditions and examine relationships or differences among variables.

A descriptive approach was employed to determine the demographic profile of the respondents in terms of age, years of professional experience, and practice setting, as well as to assess their knowledge of the benefits and risks of micronutrients and their counseling practices, including clinical decision-making and patient counseling. In addition, the comparative design was used to determine whether significant differences existed in respondents' knowledge and counseling practices across demographic groups.

This research design was appropriate for the study because it allowed the researchers to examine variables as they naturally occurred without manipulation. Furthermore, the cross-sectional approach enabled the researchers to obtain a clear snapshot of respondents' current knowledge and counseling practices at a specific point in time, without requiring long-term observation, making it efficient and practical for achieving the study's objectives.

Research Locale

The study was conducted in Rural Health Units (RHUs) and selected community pharmacies in the Province of South Cotabato, Philippines. The province was chosen as the locale of the study due to the presence of both public and private pharmaceutical practice settings where pharmacists are actively involved in the delivery of primary healthcare services, including medication dispensing and patient counseling. These settings provide direct access to pregnant women who frequently seek advice on supplement use, making the area highly relevant for assessing pharmacists' knowledge and counseling practices on micronutrient use during pregnancy.

South Cotabato is located in the SOCCSKSARGEN Region of Mindanao and consists of one component city and ten municipalities, namely: Koronadal City, Banga, Lake Sebu, Norala, Polomolok, Tupi, Tampakan, Tantangan, Sto. Niño, T'Boli, and Surallah. General Santos City was excluded from the study due to its status as an independent highly urbanized city and separate administrative jurisdiction.

The province's healthcare system, which includes RHUs and community pharmacies, plays a significant role in maternal and child health services, particularly in rural and semi-urban communities. This makes South Cotabato an appropriate setting for examining the knowledge and counseling practices of pharmacists regarding micronutrient use among pregnant women.

According to the 2020 Census, the total population of South Cotabato, excluding General Santos City, was 975,476, representing approximately 3.72% of the population of the Mindanao island group. This population distribution, along with its mix of rural and urban communities, provides a suitable context for studying variations in pharmacy practice within primary healthcare settings.

Participants of the Study

The participants of this study are licensed pharmacists working in Rural Health Unit (RHU) Pharmacies and selected community pharmacies in South Cotabato. The respondents were chosen using a purposive sampling technique, meaning only those who met the inclusion criteria are to be selected. The inclusion criteria are licensed pharmacist currently practicing in RHU/CHO or community pharmacies in South Cotabato, and interacts with pregnant women during their practice. The number of respondents was decided based on the data gathered from the FDA, this data consist of all the registered pharmacies in community and rural or city health pharmacies only. The data is solved with a confidence level of ninety percent, fifty percent as population proportion and five as its margin of error.

Sampling Technique

The data gathered from the survey questionnaires were analyzed using descriptive and inferential statistical methods to ensure accurate interpretation of the findings.

Descriptive statistics, including frequency counts, percentages, means, and standard deviations, were used to summarize the demographic profile of respondents by age, years of professional experience, and practice setting (community pharmacy and RHU/CHO). These statistical tools were also used to describe the level of knowledge

regarding the benefits and risks of micronutrient use, as well as pharmacists' counseling practices, including clinical decision-making and patient counseling.

For inferential analysis, differences in knowledge and counseling practices across demographic variables (age, years of professional experience, and practice setting) were examined using appropriate statistical tests. One-way Analysis of Variance (ANOVA) was used to determine significant differences among groups. When assumptions of normality or homogeneity of variance were violated, the non-parametric alternative, the Kruskal–Wallis test, was applied. Post hoc tests, such as Tukey's Honest Significant Difference (HSD) and Dunn's test, were conducted to identify specific group differences when significant results were obtained. All statistical analyses were conducted to ensure objectivity and rigor in data interpretation, thereby providing a sound basis for assessing pharmacists' knowledge and counseling practices regarding micronutrient use during pregnancy.

Research Instrument

A three-part self-made and validated survey questionnaire was used in this study. Part I consisted of five (5) items designed to collect the respondents' demographic profile, including age, years of professional experience, and practice setting.

Part II comprised twenty (20) items that assessed the respondents' level of knowledge regarding the benefits and risks of micronutrient use during pregnancy. This section assessed pharmacists' understanding of the topic.

Part III consisted of ten (10) items divided into two domains: clinical decision-making and evidence-based consultation practices, and patient counseling practices on the risks and benefits of micronutrient use. This section assessed the respondents' counseling practice.

The questionnaire utilized dichotomous scoring for Part II and a Likert scale for Part III to quantify respondents' knowledge and counseling practices. The instrument was designed to generate quantitative data aligned with the study's objectives. To ensure validity and reliability, the questionnaire was developed based on established principles of instrument construction. Content validation was conducted by two (2) registered pharmacists and one (1) registered midwife. Their suggestions and recommendations were incorporated in the revision and finalization of the instrument before its administration.

Research Procedures

The study began with the preparation and validation of the survey questionnaire. The instrument was reviewed by experts in pharmacy and midwifery and research methodology to ensure clarity, relevance, and reliability. After validation, formal permissions were obtained from the local government of Koronadal City and different Municipalities of South Cotabato, and from the management of participating pharmacies. Consent letters were provided to inform them about the purpose, procedures, and ethical considerations of the study, ensuring transparency and compliance with ethical research standards.

Data collection was conducted through on-site visits to selected pharmacies within Koronadal City. The researchers personally distributed and retrieved the instruments to ensure completeness and to clarify any items that may have been misunderstood. Adequate time was provided to allow respondents to answer without disrupting normal pharmacy operations. After data collection, the completed questionnaires were organized, coded, and analyzed using appropriate descriptive statistical tools. Responses from Likert-scale items were summarized using mean and standard deviation. These statistical measures were used to describe the levels of knowledge, attitudes, and practices of community pharmacists regarding micronutrient use among first- and second-trimester pregnant women, serving as a basis for interpretation, conclusions, and recommendations.

Scoring and Quantification

To describe the study's various dimensions, the researcher employed dichotomous scoring for Part II of the questionnaire, which assessed knowledge in a test format with each item having one correct answer (correct = 1 point; incorrect = 0 points). In Part III of the questionnaire, a 4-point Likert scale was used.

This scale was used to measure respondents' counseling practices, including their attitudes, perceptions, and behaviors regarding counseling practices of public health and community pharmacists on micronutrient use among first- and second-trimester pregnant women. The 4-point Likert scale included four response options: 1 – Never, 2 – Rarely, 3 – Often, and 4 – Always. This format encouraged respondents to express a clear position without a neutral option, thereby reducing indecisiveness and promoting more definitive responses.

The use of dichotomous scoring and a 4-point Likert scale was appropriate for this study as it allowed the quantification of both knowledge and counseling practices. These scoring methods yielded clearer, more objective data on pharmacists' knowledge and practices regarding micronutrient counseling during pregnancy

RESULTS AND DISCUSSION

Table 1. Profile of Respondents in terms of Age

Age	Frequency	Percent
20-29 years old	75	72.8
30-39 years old	14	13.6
40-49 years old	2	1.9
50 years old and above	12	11.7
Total	103	100.0

The results in Table 1 shows that the majority of respondents belong to the 20–29 years old age group (72.8%), followed by those aged 30–39 years (13.6%) and 50 years old and above (11.7%), while only a small proportion belongs to the 40–49 years old group (1.9%). This indicates that most respondents are relatively young and are likely in the early stages of their professional careers.

The age distribution suggests that the study population is predominantly composed of younger professionals, with limited representation from older age groups, particularly those aged 40–49 years. This implies that most participants are at the beginning of their professional practice.

These findings are consistent with broader demographic trends in professional research, which show higher participation rates among younger adults, particularly those in their 20s and 30s. According to Wagner et al. (2018), younger professionals are more likely to participate in surveys due to higher digital literacy and greater familiarity with technology-based data collection methods. Similarly, Bosch et al. (2018) noted that younger individuals tend to engage more in computer-mediated communication, thereby facilitating their participation in research activities. Furthermore, the 20–29 age group represents a critical stage in workforce entry, when individuals are establishing their professional roles and responsibilities (Johnson & Monserud, 2010). As such, the dominance of younger respondents in this study reflects the current composition of the healthcare workforce, where early-career professionals constitute a significant proportion (Fisher College of Business, 2018).

Table 2. Profile of the Respondents in terms of Years of Professional Experience

Years of Professional Experience	Frequency	Percent
1-3 years	54	52.4
4-6 years	18	17.5
7-10 years	10	9.7
More than 10 years	16	15.5
less than 1 year	5	4.9
Total	103	100.0

Table 2 unveils that in terms of professional experience, most of the respondents had 1–3 years of experience (52.4%), followed by those with 4–6 years (17.5%), more than 10 years (15.5%), 7–10 years (9.7%), and less than 1 year (4.9%).

The results indicate that the majority of respondents were early-career pharmacists, with more than half having 1–3 years of professional experience. This suggests that the study population is largely composed of practitioners in the initial stage of their pharmacy practice.

This finding is consistent with healthcare workforce studies showing that newly licensed professionals constitute a significant proportion of active practitioners (Parial et al., 2024). Early-career pharmacists typically rely on foundational academic training and early workplace experience as they transition into independent practice. Experience has been identified as a key factor in the development of clinical judgment and professional confidence in healthcare settings (Stark et al., 2021). Furthermore, workforce studies indicate that younger, less experienced professionals dominate many healthcare service settings due to recent workforce expansion and turnover (Felipe-Dimog et al., 2021).

Further, the results indicate a workforce with relatively limited professional experience, suggesting a need for continuous professional development and experiential learning opportunities for pharmacists.

Table 3. Profile of the Respondents in terms of Practice Setting

Facility Type	Frequency	Percent
Community Pharmacy	88	85.4
RHO/CHO	15	14.6
Total	103	100.0

The results of table 3 shows that most respondents were from community pharmacy setting (85.4%), while a smaller proportion came from Rural Health Unit/City Health Office (RHU/CHO) settings (14.6%). This indicates that the study population is predominantly composed of community-based pharmacists, with limited representation from public health facilities.

This distribution reflects the structure of pharmacy practice in the Philippines, where community pharmacies are more widely distributed and more accessible compared to government health units (Parial et al., 2024). Community pharmacists are also more frequently engaged in direct patient interaction due to the nature of their daily responsibilities, which typically include dispensing medications and providing patient counseling services (Stark et al., 2021). As such, the dominance of community pharmacy respondents suggests that the study's findings better reflect community-based pharmaceutical practice.

Overall, the results highlight the predominance of community pharmacists in the study population, indicating that most respondents are engaged in community pharmacy services. This underscores the role of community pharmacies as a primary point of access for medications and health information, particularly in maternal care services (Felipe-Dimog et al., 2021).

Table 4. Level of Knowledge in the Recommended Micronutrient Use in Pregnancy

Level of Knowledge	Mean	SD	Interpretation
Benefits of Micronutrients	9.563	0.723	High
Risks of Micronutrients	9.485	0.765	High

Table 4 shows that respondents demonstrated a very high level of knowledge regarding both the benefits and risks of micronutrient use during pregnancy. In the benefits component, respondents obtained an overall mean score of 9.563 out of 10, indicating near-perfect performance on knowledge-based items. Similarly, the risks component had an overall mean score of 9.485, indicating a very high level of knowledge. These results indicate that the respondents possess strong and well-balanced knowledge of micronutrient use during pregnancy.

The consistently high scores across both components suggest that respondents have a comprehensive understanding of micronutrient supplementation, including both its therapeutic benefits and potential risks. Minor variations in a few items indicate slight differences in depth of understanding for specific concepts, but

these do not significantly affect the overall interpretation. In addition, the results across demographic variables show that high levels of knowledge are generally consistent across age, years of experience, and practice setting.

These findings are consistent with studies highlighting the importance of standardized pharmaceutical education and continuing professional development in strengthening maternal health knowledge among healthcare providers. High knowledge levels reflect an understanding of the risk–benefit principle in clinical practice, which guides safe and effective decision-making in patient care (Gabbay & Le May, 2004). Similarly, Zamanakou et al. (2020) emphasized that healthcare professionals play a critical role in prenatal education, as their knowledge directly influences the quality of counseling provided to pregnant women. However, slight variations in specific knowledge areas align with previous findings that practitioners may demonstrate a stronger understanding of general concepts than of more complex or technical aspects, such as dosage limits or nutrient interactions (Abebe et al., 2019).

Table 5. Level of Knowledge in the recommended micronutrient use in pregnancy in terms of Benefits of Micronutrients

Benefits of Micronutrients	Mean	SD
1. Folic acid supplementation during early pregnancy helps prevent	0.981	0.139
2. Iron supplementation during pregnancy is mainly recommended to	1.000	0.000
3. Calcium intake during pregnancy is important because it	0.971	0.169
4. Vitamin D during pregnancy helps in	0.932	0.243
5. Adequate iodine intake during pregnancy supports	0.854	0.354
6. Multiple micronutrient supplementation during pregnancy primarily helps to	0.961	0.194
7. Vitamin C intake during pregnancy is important because it	0.961	0.194
8. Adequate micronutrient intake during pregnancy helps reduce the risk of	0.990	0.99
9. Proper micronutrient supplementation contributes to	1.000	0.000
10. Prenatal micronutrient supplementation is recommended to	0.913	0.284
Total	9.563	0.723

Table 5 presents the respondents' level of knowledge regarding the benefits of recommended micronutrients during pregnancy. The findings revealed an overall mean score of 9.563, interpreted as Very High Knowledge, indicating that the respondents were highly knowledgeable about the positive effects of micronutrient supplementation among first- and second-trimester pregnant women. Most of the items obtained mean scores close to 1.00, suggesting that respondents were able to correctly identify the essential benefits of micronutrients such as folic acid, iron, calcium, and vitamin D in supporting maternal health and fetal development.

This finding suggests that pharmacists are well-informed about the role of micronutrients in preventing maternal anemia, supporting fetal brain and neural tube development, strengthening maternal bone health, and reducing pregnancy-related complications. Their strong knowledge may be attributed to formal pharmacy education, clinical exposure, and access to updated healthcare information regarding maternal nutrition.

The consistently high scores across respondents also imply that knowledge on micronutrient benefits is generally uniform regardless of demographic factors such as age, years of experience, and practice setting. This supports the idea that pharmacists possess a strong foundational understanding of prenatal nutritional needs, allowing them to provide appropriate recommendations to pregnant women.

However, slight decreases in some specific items may indicate minor knowledge gaps in certain micronutrient-related concepts. These areas may still require reinforcement through continuous professional development seminars and updated maternal health training programs.

The findings support the study of Zamanakou et al. (2020), which emphasized that healthcare providers' knowledge on prenatal nutrition significantly influences the quality of maternal healthcare counseling. Similarly, World Health Organization (2020) highlighted that proper healthcare provider knowledge is essential in ensuring safe and effective micronutrient use during pregnancy.

Table 6. Level of Knowledge in the recommended micronutrient use in pregnancy in terms of Risks of Micronutrients

Risks of Micronutrients	Mean	SD
1. Iron deficiency during pregnancy may lead to	1.000	0.000
2. Failure to take folic acid during the first trimester increases the risk of	1.000	0.000
3. A severe deficiency in Zinc during pregnancy is associated with	0.796	0.405
4. Calcium taken together with iron supplements may	0.932	0.243
5. Incorrect micronutrient supplementation during pregnancy may result in	1.000	0.000
6. Excessive intake of vitamin A during pregnancy may cause	0.913	0.284
7. Taking micronutrient supplements without proper guidance may	0.990	0.099
8. Improper iron supplementation may commonly cause	0.951	0.216
9. Combining multiple supplements without professional advice may result in	0.990	0.099
10. Lack of counseling on micronutrient use may increase the risk of	0.990	0.099
Total	9.485	0.765

As shown in Table 6, the respondents had an overall mean score of 9.485, indicating Very High Knowledge regarding the risks associated with micronutrient use during pregnancy. This indicates that respondents have a strong understanding of potential risks, contraindications, and improper use of micronutrient supplementation.

The results suggest that pharmacists are knowledgeable about both the benefits and risks of micronutrient use, including the importance of proper dosage and adherence to recommended supplementation guidelines. Minor variations in some items indicate that a few respondents may require further clarification on more complex or emerging risk-related concepts.

These findings are consistent with Aidoo (2024), who emphasized that healthcare providers must possess adequate knowledge of both benefits and risks to ensure accurate counseling. Similarly, Tsegaye (2024) found that higher provider knowledge is associated with improved adherence to iron-folic acid supplementation among pregnant women, highlighting the importance of pharmacist education in maternal care.

Level of Practice in the Recommended Micronutrient Use in Pregnancy

This section presents the level of practice of public health and community pharmacists in the recommended use of micronutrients during pregnancy. It specifically examines their clinical decision-making and evidence-based consultation practices, as well as their patient counseling practices regarding the risks and benefits of micronutrient supplementation. The discussion provides an overview of how pharmacists apply their knowledge in actual practice settings when guiding pregnant women on safe and appropriate micronutrient use.

Table 7. Level of Counseling Practice in the Recommended Micronutrient Use in Pregnancy

Level of Practice	Mean	SD	Interpretation
Clinical Decision-Making and Evidence-based consultation practice	3.641	0.490	High
Patient counseling practice on risks and benefits of micronutrient use	3.531	0.604	High

Table 7 shows that respondents demonstrated a high level of practice in both clinical decision-making with evidence-based consultation and patient counseling on the risks and benefits of micronutrient use. Clinical decision-making and evidence-based consultation obtained mean scores of 3.709 (SD = 0.372) and 3.639 (SD = 0.446), respectively, both interpreted as High Practice. The relatively low standard deviation values indicate consistency in respondents' answers across both domains.

Among the two domains, clinical decision-making and evidence-based consultation had slightly higher mean scores than patient counseling practice. This suggests that respondents may demonstrate greater consistency in

applying evidence-based clinical decisions compared to patient counseling activities. Nevertheless, the findings indicate that respondents possess strong competencies in both aspects of professional practice.

These findings support the Evidence-Based Practice (EBP) model proposed by David Sackett and colleagues (1996), which emphasizes integrating clinical expertise and research evidence to improve patient care outcomes. The higher score in clinical decision-making suggests strong adherence to established maternal nutrition guidelines and evidence-based recommendations. Studies have shown that healthcare providers prioritize evidence-based consultation to ensure safe and effective prenatal supplementation practices, particularly regarding folic acid and iron intake during pregnancy (Milman, 2012). Furthermore, Bastos et al. (2019) emphasized that effective patient counseling improves adherence to micronutrient supplementation among pregnant women. Overall, the findings suggest that respondents are capable of integrating evidence-based knowledge into clinical practice while maintaining effective patient counseling practices.

Significance Difference in Knowledge and Practice in terms of Age, Years of Practice and Practice Setting

This section presents an analysis of significant differences in the knowledge and counseling practices of public health and community pharmacists regarding recommended micronutrient use during pregnancy, grouped by age, years of professional experience, and practice setting. The findings determine whether demographic characteristics influence the respondents' level of knowledge and professional practices.

Table 8. Significance difference in Knowledge and Practice in terms of Age, Years of Practice and Practice Setting

Independent Variable	Dependent Variable	F-value/ H-value	p-value	Interpretation
Age	Knowledge	4.270	0.007	Significant
	Practice	1.807	0.151	Not Significant
Years of Practice	Knowledge	2.152	0.080	Not Significant
	Practice	2.986	0.023	Significant
Practice Setting	Knowledge	0.102	0.750	Not Significant
	Practice	0.031	0.860	Not Significant

Table 8 presents significant differences in knowledge and counseling practices among public health and community pharmacists regarding micronutrient use during pregnancy, grouped by age, years of professional experience, and practice setting.

The results revealed no significant differences in practice level when respondents were grouped by age ($p = .151$) or practice setting ($p = .860$), as both p -values were greater than 0.05. However, a significant difference was found when respondents were grouped by years of professional experience ($p = .023$), indicating that practice level varies with professional service length.

Based on these findings, the null hypothesis (H_0) is rejected. This decision is made because at least one of the tested grouping variables, specifically years of professional experience, showed a statistically significant difference at the 0.05 level. This means that the results do not support the assumption of no significant differences across all grouping variables.

These results suggest that professional experience plays a key role in shaping pharmacists' practice levels, likely due to accumulated exposure and clinical experience over time. In contrast, the non-significant findings for age and practice setting imply that standardized education, training, and institutional protocols may contribute to relatively uniform practice levels across different demographic groups.

The findings support Patricia Benner's Novice-to-Expert Theory, which proposes that professional competence develops through experience and progression over time (Benner, 1984). Similarly, research in healthcare practice

indicates that years of experience are more strongly associated with improved clinical judgment and practice performance than age or workplace setting alone (McHugh & Lake, 2010).

SUMMARY OF THE FINDINGS

This study generally aimed to determine the knowledge and counseling practices of public health and community pharmacists regarding micronutrient use among first- and second-trimester pregnant women in South Cotabato. Specifically, it sought to describe the respondents' demographic profile in terms of age, years of professional experience, and practice setting; determine their level of knowledge regarding the benefits and risks of micronutrient use during pregnancy; and assess their counseling practices in terms of clinical decision-making with evidence-based consultation and patient counseling on the risks and benefits of micronutrient use. It also examined whether there were significant differences in knowledge and counseling practices across age, years of professional experience, and practice setting. The study utilized a quantitative cross-sectional research design and involved 103 licensed pharmacists working in Rural Health Unit (RHU) pharmacies and selected community pharmacies in South Cotabato.

The results showed that the majority of respondents were young professionals, with most belonging to the 20–29 age group (72.8%), followed by 30–39 years (13.6%), 50 years and above (11.7%), and a small proportion from 40–49 years (1.9%), indicating a predominantly early-career workforce. In terms of professional experience, most respondents had 1–3 years of experience (52.4%), followed by 4–6 years (17.5%), more than 10 years (15.5%), 7–10 years (9.7%), and less than 1 year (4.9%), confirming that the sample is largely composed of early-stage practitioners. Regarding practice setting, the majority were from community pharmacies (85.4%), while a smaller proportion were from Rural Health Unit/City Health Office settings (14.6%), indicating a strong dominance of community-based pharmacists. Overall, the findings suggest that respondents are mainly young, early-career pharmacists working in community pharmacy settings, reflecting the general structure and distribution of the pharmacy workforce in the Philippines.

In terms of knowledge, respondents demonstrated a very high level of understanding of both the benefits and risks of micronutrient use during pregnancy, indicating well-balanced, comprehensive knowledge across key areas. Similarly, the level of practice was generally high in both clinical decision-making with evidence-based consultation and patient counseling on micronutrient use. Inferential analysis revealed no significant differences in knowledge or practice across age and practice-setting groups. In contrast, years of professional experience were significantly associated with practice levels, indicating that experience influences practice levels among pharmacists. Overall, the results suggest that respondents possess strong knowledge and practice competencies, with professional experience emerging as the key differentiating factor in their practice performance.

In terms of counseling practice, respondents demonstrated a high level of both clinical decision-making with evidence-based consultation and patient counseling regarding the risks and benefits of micronutrient use during pregnancy. Clinical decision-making and evidence-based consultation obtained mean scores of 3.709 (SD = 0.372) and 3.639 (SD = 0.446), respectively, both interpreted as high practice, with low standard deviation values indicating consistency among participants. The slightly higher mean in clinical decision-making suggests greater consistency in applying evidence-based clinical judgment compared to patient counseling; however, both domains reflect strong professional competence. Overall, the findings indicate that pharmacists demonstrate well-developed, consistent counseling practices, particularly in integrating evidence-based decision-making and patient education into maternal micronutrient use.

The findings revealed no significant differences in knowledge and counseling practices between public health and community pharmacists, regardless of age ($p = .151$) or practice setting ($p = .860$), indicating that these variables do not influence practice levels. However, a significant difference was found based on years of professional experience ($p = .023$), suggesting that practice levels vary depending on length of professional service. Based on these results, the null hypothesis was rejected, as at least one grouping variable showed a statistically significant difference. Overall, the findings indicate that professional experience plays a key role in influencing pharmacists' practice levels. In contrast, age and practice setting do not significantly affect

knowledge and counseling practices, supporting the idea that competence develops through accumulated experience over time.

CONCLUSION

This study shows that public health and community pharmacists in South Cotabato are predominantly young, early-career professionals working primarily in community pharmacy settings, with most having limited professional experience. Despite this, they demonstrated a very high level of knowledge regarding both the benefits and risks of micronutrient supplementation during pregnancy, indicating a strong, well-balanced understanding of maternal supplementation. In addition, the pharmacists demonstrated a high level of counseling practice in clinical decision-making, with evidence-based consultation and patient counseling, showing consistency and competence in applying professional guidelines in actual practice.

Furthermore, the study revealed that knowledge and counseling practices did not differ significantly by age or practice setting, suggesting that these factors do not influence pharmacists' performance in this area. However, a significant difference was found in relation to years of professional experience, indicating that length of service plays an important role in shaping counseling practices. Overall, the study indicates that while pharmacists generally possess strong knowledge and counseling competencies regarding micronutrient use during pregnancy, professional experience remains a key factor influencing the quality of their practice.

RECOMMENDATION

Based on the summary and conclusion, the following are hereby recommended:

1. It is recommended that health facilities such as RHU/CHO and Community Pharmacies strengthen structured mentorship programs where more experienced pharmacists guide early-career pharmacists, particularly in applying clinical decision-making and patient counseling on micronutrient use during pregnancy. This will help reduce variability in practice linked to years of professional experience and promote more consistent service delivery.
2. Pharmacy regulatory bodies and professional organizations are encouraged to design targeted CPD programs that focus not only on knowledge reinforcement but more importantly on advanced counseling skills, communication strategies, and practical case-based learning in maternal health and micronutrient counseling. This ensures that knowledge is translated into effective patient-centered counseling practice.
3. Early-career pharmacists are encouraged to actively engage in experiential learning opportunities such as clinical exposure, preceptorships, and case discussions to strengthen their counseling confidence and clinical judgment. Since experience was found to significantly influence practice, deliberate skill-building during early practice years is essential.
4. Pharmacy education programs are encouraged to further strengthen maternal health and nutrition-related counseling components through simulation-based training, role-playing, and case-based learning to better prepare graduates for real-world counseling responsibilities in both community and public health settings.
5. Future studies may explore intervention-based research focusing on counseling enhancement programs, as well as qualitative studies that examine barriers experienced by early-career pharmacists in delivering effective micronutrient counseling. Expanding the study to other provinces may also improve generalizability.

ACKNOWLEDGEMENT

The researchers wish to express their profound gratitude and sincere appreciation to the following individuals whose invaluable support and guidance contributed to the successful completion of this study: To the Almighty

God, for His unwavering guidance, boundless love, and for being the ultimate source of strength and inspiration throughout this academic journey. To Erwin M. Faller, RPh, MSPharm, PhD, MMPH, FRIPHARM, their research adviser, for his profound wisdom, steadfast support, and invaluable mentorship. His guidance provided the researchers with the foundation necessary to accomplish this work with excellence. To Cynthia Claire F. Guinto, RPh, ClinPharm, the researchers' group adviser, for her invaluable assistance and for generously dedicating her time and expertise to help the researchers achieve their objectives. To the expert validators, Mershen B. Gania, RPh, ClinPharm, MSc; Cherry-Ann Faith M. Baruis, RPh, MSPharm; and Rishyl B. Anocha, RM, MHA, for their time, expertise, and careful evaluation of our research instruments. Their constructive feedback greatly contributed to ensuring the validity and reliability of the data collection process. To Apple Jane Siroy, RPh, MSPharm, for her commendable dedication and unwavering perseverance despite numerous challenges. Her commitment was instrumental in achieving the goals of this study. To Jefferson Chanco, RPh, for the insightful advice and innovative ideas he generously shared, especially during the moments when the researchers needed guidance the most. To the distinguished panel members, for their rigorous evaluation, valuable expertise, and meaningful recommendations. The researchers are deeply grateful for their guidance in identifying areas for improvement and for upholding the standards of academic excellence and integrity. To the researchers' families, friends, and classmates, whose unwavering love, encouragement, understanding, and moral support gave the researchers the strength and motivation to persevere throughout this endeavor.

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