REVIEW ARTICLE

Counseling intervention on iron-folic acid adherence and clinical outcomes among pregnant women and women planning to be pregnant: a scoping review

Rizka Novia Atmadani[*1,2], Akrom Akrom[2], Siti Urbayatun[3], Mayuri N. Tuwar[4]

[1]Department of Pharmacy, Faculty of Health Science, University of Muhammadiyah Malang, Malang, Indonesia
[2]Faculty of Pharmacy, University of Ahmad Dahlan, Yogyakarta, Indonesia
[3]Faculty of Psychology, University of Ahmad Dahlan, Yogyakarta, Indonesia
[4]School of Public Health, College of Public Health, Taipei Medical University, Taipei 106236, Taiwan

Corresponding Author: Rizka Novia Atmadani **Email:** rizkanovia@umm.ac.id

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ABSTRACT

Anemia during pregnancy is a major health problem that affects 25-50% of the world's population and around 50% of pregnant women. One of the causes of stunting is Low Birth Weight, which most often occurs in mothers who suffer from anemia. Making sure pregnant women have access to iron-folic acid supplement programs is challenging. People's inability to comply often occurred as the result of a lack of understanding of the benefits or harms of the supplement. Providing counseling to pregnant women to improve adherence to taking blood-added supplements has resulted in significant benefits and impacts on changes discussed in several studies that have been conducted in several countries. Through a review of the literature, this study seeks to ascertain the contribution that counseling interventions have to improving iron-folic acid prescription adherence. This study used a literature study research method by examining 8 journals published on the SCOPUS, PubMed, and Garuda Websites. After that, descriptive analysis was used to examine the data from the selected journals. The 8 journals supported the idea that counseling can improve adherence to iron and folic-acid supplementation. There are numerous ways to provide counseling, including the traditional face-to-face approach, the 5A brief approach, leaflet/brochure-based approaches, and counseling through illustrated books. This study concludes that counseling interventions are more effective due to the careful planning of tailored interventions with more regular follow-ups, various forms of interactive educational media, patient characteristics, and direct health professional intervention related to counseling.

Key words:
counseling, scoping review, women with anemia, adherence, clinical result

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INTRODUCTION

Anemia is a sign of both inadequate dietary intake and overall health.[1] When the quantity and size of red blood cells, or the hemoglobin concentration fall below a set cut-off value, the blood's ability to carry oxygen throughout the body is compromised. This condition is known as anemia. The regions with the highest anemia prevalence were South Asia and Central and West Africa.[2] Anemia, especially iron-deficiency anemia, affects women of reproductive age, pregnant women, teenage girls, and young children in low and middle-income countries.[3–5] Iron deficiency anemia is common during pregnancy and is associated with adverse outcomes[6]. Programs in several countries to reduce the incidence of anemia have been widely implemented and there has been a significant reduction in the prevalence of anemia. However, overall, progress has not been significant either. In Indonesia, the maternal mortality ratio is 305/100,000 live births.[6]

Although there are many other causes of anemia, it is believed that iron deficiency accounts for 50% of all instances. One of the most prevalent dietary deficiencies in the world, iron deficiency, affects more than 2 billion people and accounts for 20% of maternal fatalities (World Health Organization (WHO), 2006). Iron deficiency anemia also has been linked with low birth weight, small gestational age size, preterm birth, need for blood transfusion for the mother, postpartum hemorrhage, [9, 10] and long-term neurocognitive effect in childhood.[11] Based on a systematic review and meta-analysis that examined the prevalence and predictors of anemia in pregnant women in Ethiopia, it was concluded that iron and folic-acid deficiencies, as well as the inadequate diversity of nutritional intake during pregnancy, are among the important factors causing anemia in pregnancy.[9] To solve this issue, it has been suggested that daily oral iron supplements with 30–60 mg of elemental iron and 400 g of folic-acid should be given as a regular component of antenatal care beginning in the second trimester[10]. The Indonesian government encourages pregnant women to take at least ninety (90) iron supplement pills containing ferrous (Fe) fumarate or ferrous sulfate to prevent and treat anemia.[11]

WHO[15] has recommended intervention to tackle anemia in nutritional programs for women of reproductive age. The program focuses on the provision of iron, folate, vitamin A, zinc, and other micronutrients through different interventions, including supplementation, fortification, and improvement of dietary diversity and food security. This literature review mentioned a similar program to handle anemia among pregnant women and those who plan to be pregnant. Even though Iron Folic-Acid (IFA) supplementation programs are frequently utilized and may be very cost-effective ways to address anemia in pregnant women,[12,13] these programs are not always as successful as planned. The IFA supplement program faces difficulties in ensuring that pregnant women who have access and an easy way to obtain IFA supplements will also take them.[14] The inability of people to take IFA is often due to a lack of understanding about the benefits of the supplement which leads

to low self-adherence. However, based on the results of a meta-analysis in the same study, it was stated that pregnant women who were given counseling about using IFA were 1.96 times more obedient to IFA compared to pregnant women who were not given counseling.[15] In addition, other factors that influence the increase in adherence to taking medication are knowledge of anemia, knowledge of blood supplements, and counseling about blood supplements.

According to WHO Adherence to Therapies: evidence for action,[19] adherence includes a wide range of behaviors related to health that go beyond taking prescribed medications. WHO also agrees to call adherence "the extent to which the patient follows medical instructions". Adherence to Iron-Folic Acid (IFA) is the degree to which patients take their medication or the requirement that they follow the dose and schedule set by their medical professionals.[20,21] One significant role in the prevention and management of iron deficiency anemia is the adherence of mothers to take iron and folic-acid supplements.[22]

Meanwhile, the outcome from adherence can be also sought from clinical outcomes of anemia among women. Based on the reference "Developing a Protocol for Observational Comparative Effectiveness Research: A User's Guide[23]", most clinical outcomes involve a diagnosis or assessment by a health care provider. The clinical outcomes may be recorded in a patient's medical record as part of routine care. Laboratory tests may be considered objective measures in most cases and can be incorporated as part of a standard outcome definition to be used for a study when appropriate. In addition, WHO asserts that biomarkers of anemia could be seen from hemoglobin concentration, ferritin, folate, and iodine.[4]

Counseling is the profession of providing support to individuals using behavioral change techniques and counseling interviews to determine and resolve clients' present issues. Naturally, enthusiasm and behavior change in a better and more positive direction will be encouraged if the client's problem can be remedied. Different from normal behaviors, altered attitudes, knowledge, and understanding, are signs of behavioral alterations.[16] In addition, according to Kottler and Shepard,[25] counseling is "a multi-dimensional and dynamic process, where emotional thinking, behavioral, experiential, or situational aspects from the past, present and future of a person are explored and assessed, with regards to his/her environment in a social, cultural, or even economic context". Furthermore, UNAIDS[26] has mentioned in the literature, the majority of adherence support programs usually include counseling as a core component because counseling enables the creation of "an interpersonal and dynamic communication process between a client and a trained counselor, which tries to solve personal, social, or psychological problems and difficulties".

Providing counseling to pregnant women to improve adherence to taking blood-added supplements has resulted in significant benefits and impacts on changes in adherence of pregnant women in several studies that have been conducted in several countries.[17–21]

Based on the background explained above, the researcher wants to undertake additional research on the subject of counseling intervention's impact on increasing adherence among pregnant women and those women planning to be pregnant, to determine whether counseling has this effect through literature studies.

METHODS

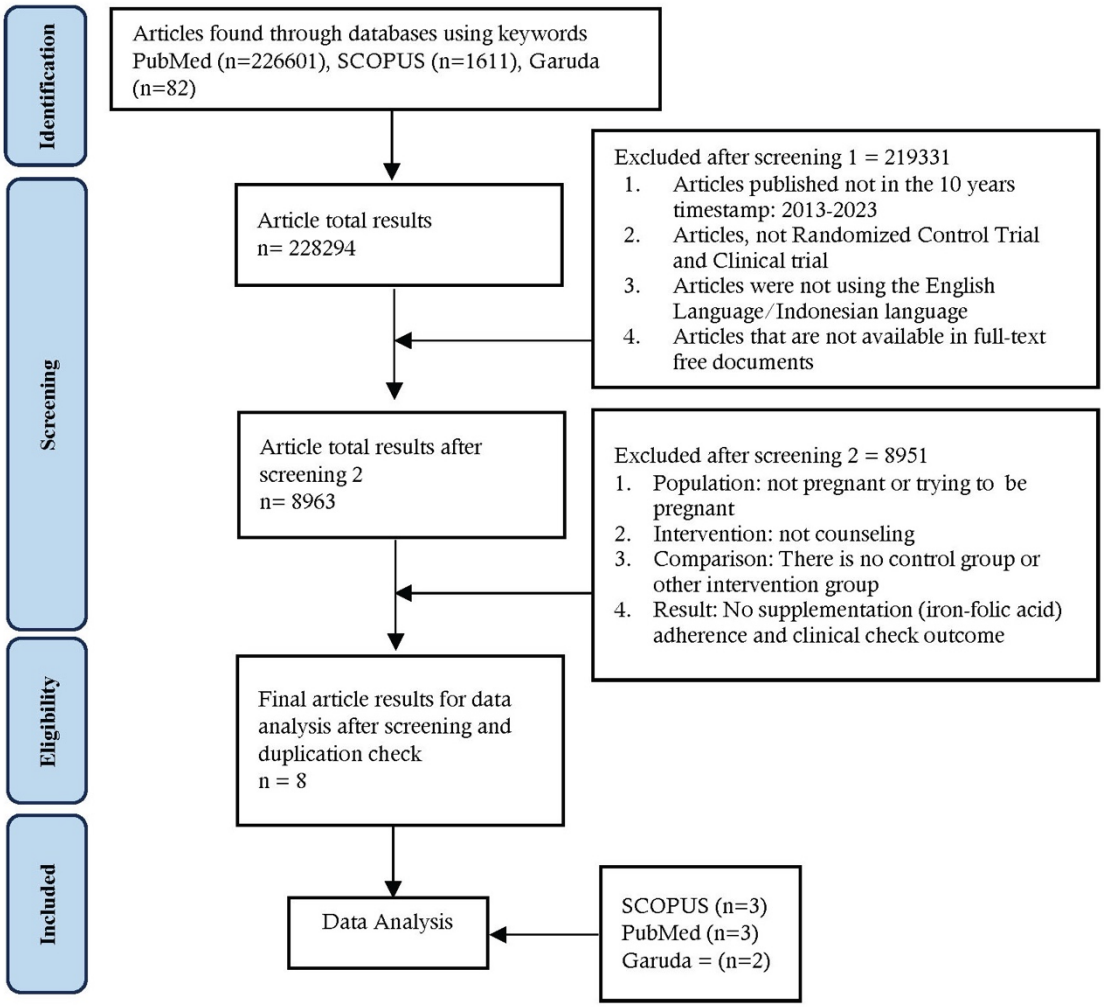

Figure 1. PRISMA flowchart for choosing studies based on the process of systematic scoping reviews

Identifying the research question

This review focused on researching counseling methods to improve medication adherence in anemic women. The process of including studies, retrieving, and summarizing the type of data, assessment, and impact of the planned intervention was led by the following research questions:

1. What techniques were employed to assess the effects of interventions on medication compliance and clinical outcomes in anemic women?
2. How did the interventions affect clinical outcomes and medication adherence overall?
3. What aspects of counseling interventions were used in the studies that were included?

There are five steps in this scoping review process according to literature which are identifying the research question; identifying relevant scientific databases; selecting studies to be included in the review; data charting; and data collating, summarizing, and reporting the results[30].

Identifying relevant scientific database

Articles were searched from SCOPUS, Garuda (Indonesian database), and PubMed. Garuda database was chosen because all the Indonesian articles in Bahasa Indonesia were published in Google Scholar with keywords in *Bahasa Indonesia*. The searched terms used were bilinguals in Bahasa and English including ("Eng"-"Ind") : ("adherence OR compliance" – "*kepatuhan*"), ("anemia OR anemia"-"Anemia"), ("medication" – "*pengobatan*"), ("pregnancy OR pregnant" – "*kehamilan*"), ("pharmacist" – "*apoteker*"), and ("intervention"-"*intervensi*").

This notion of a literature review is often based on the original approach for doing scoping studies [22] and enhanced further by Levac et al [23] was followed as the basis for conducting this review.

Selecting articles to be included in the review

The full-text original research articles published between 2012 and 2022 mostly reported the impact of counseling intervention on medication adherence among pregnant women with anemia and were set as the inclusion criteria in this scoping review. The years covered in all databases that projected the information needed were captured withing ten years from 2012-2022. We tried to search for articles published both in English and also in *Bahasa Indonesia*. The searches were limited to the last ten years to provide a glance of the most recently published interventions. We excluded the review articles (systematic reviews and meta-analysis studies), book chapters, and proceeding publications. This scoping review focuses on the studies conducted globally, including in Indonesia (identified inclusion and exclusion criteria presented in Table 1).

Table 1. Inclusion Criteria

Category	Inclusion Criteria
Language	English *Bahasa Indonesia*
Publishing year	2012-2022
Research outcome	Medication adherence intervention and clinical outcomes
Sample criteria	Pregnant women or women planning to be pregnant aged 18 years old or above who have received an intervention to enhance medication adherence
Methodology	Studies examining the effects of interventions on the outcome indicators among samples
Publication Type	Original research articles

Data charting, collating/sequencing, summarizing, and results reporting

The chosen research data were gathered in the form of a table that included the research number, author, year and location of the study, research objectives, sample size, study design, inclusion/exclusion criteria, interventions carried out, comparisons/controls used (if any), and main research data gleaned from

the investigation. To minimize bias, data extraction was done by at least two researchers.

RESULTS

Characteristics of the Included Studies

The review comprised 8 trials including 1058 articles. Of the 8 included studies, two were quasi-experimental studies and six were randomized experimental studies (see Table 2). Eight studies examined the effects of counseling interventions on supplementation adherence for iron and folic-acid. In terms of the locations of the included studies, 7 were carried out in Indonesia and 1 in Ethiopia. One study in Ethiopia examined the phenomenon among women planning to be pregnant, meanwhile, 7 studies investigated it among pregnant women.

Impact of Counseling Intervention Measurement

All the included studies reported measures for iron folic-acid supplementation adherence (see Table 2). A total of two studies reported the assessment of clinical outcomes and reported adherence measures (n=2)[21,28]. One study investigated hemoglobin and hematocrit concentration using a Diacon Abacus 3 hematology analyzer. Another study reported hemoglobin as the clinical outcome using STAT-Site MHgb with the Azide-methemoglobin method. All of these studies indicated a significant impact of the interventions on the clinical outcomes of hemoglobin and hematocrit. All studies reported Iron-Folic Acid adherence with different methods of measuring medication adherence. These included Morisky Medication Adherence Scale (MMAS-8) and its related scales (n=5), as well as manual pill count (n=3). Some studies also projected knowledge regarding IFA and the related iron-rich food intake, birth weight, attitude, and perception [25–28].

Intervention and Control Types

Overall, conventional face-to-face counseling was the most frequently used intervention in the included studies (see Tables 3 and 4), where patients were provided counseling on lifestyle, dietary habits, risk factors of anemia, definition, signs and symptoms, prevention and treatment, as well as iron-rich foods, and complication. The counseling provided some information on how to take the IFA supplementation (such as when to take the tablets, how is the way to absorb the tablet more, what side effects did the tablets produce, and what are the benefits of consuming the iron-folic acid supplementation). There was significant variation in the way these interventions were delivered, as noted in the face-to-face counseling. For instance, one study implemented a quick counseling technique known as 5A, which was a successful short-term therapy to improve patient medication compliance[21,29]. It helps pharmacists gauge how willing each respondent is to alter their behavior to consume iron supplements properly[30]. Other examples were the use of successive series of interactive media for additional intervention along with counseling. However, one study tested the impact of interactive media alone or

counseling in a comparative context. Additionally, one study exercised both SMS reminders and counseling interventions in their intervention group. Well-organized multicomponent treatments were used in four studies including pre-assessment of individual's adherence level, knowledge, food frequency, attitude, and perception[25–28]. On the other hand, seven studies determined usual care from the health facility as the control group.

Impact of Health Profession and Interactive Media on IFAS Adherence and Clinical Outcomes

Four studies found that pharmacist interventions had a substantial impact on drug adherence (see Table 3). Of these, three studies involved midwives and one study included a doctor as the counselor for the intervention. For interactive media being used among the six included studies, there were several types observed. For example, along with the counseling, five studies added interactive media to help educate the patient. There were pictured-based nutrition education brochures, pictorial handbooks, leaflets, brochures, and flip sheets. Meanwhile, one study compared counseling with leaflet education (see Tables 4 and 5).

Table 2. Key findings from the literature

Author	Title	Study Design	Study sample	Key findings
Berhane A, Belachew T (2022)	Effect of Picture-based health education and counseling on knowledge and adherence to preconception Iron-folic acid supplementation among women planning to be pregnant in Eastern Ethiopia: a randomized controlled trial	A two-arm randomized controlled community trial using a parallel design	244 women	The findings demonstrated that understanding and adherence to the preconception of the IFAS intake among women who plan to get pregnant were significantly impacted by the picture-based nutrition education intervention strategy in combination with continual monitoring through family visits.
Nahrisah P, Somrongthong R, Viriyautsahakul N, Viwattanakulvanid P, Plianbangchang S (2020)	Effect of Integrated Pictorial Handbook Education and Counseling on Improving Anemia Status, Knowledge, Food Intake, and Iron Tablet Compliance Among Anemic Pregnant Women in Indonesia: A Quasi-Experimental Study	A quasi-experimental pre-test–post-test control group design	140 anemic pregnant women	The results demonstrated a positive effect on hemoglobin and hematocrit levels for anemic pregnant women in their third trimester of pregnancy when individual instruction through a graphical handbook on anemia was combined with the counseling intervention program.
Heryadi PL, Sauriasari R, Andrajati R (2017)	The influence of pharmacist counseling on changes in hemoglobin levels of pregnant women at a community health center in Indonesia	An experimental with a randomized pre-post control design.	192 pregnant women	The study's findings suggested that pregnant women receiving anemia therapy at the CHC of the Pagedangan Sub-district, Tangerang District, could benefit from pharmacist counseling.
Prihanti GS, Imawan R, Iskandar FY, Diastuti LP, Adawiyah R, Safrillia S, et al (2022)	The Effect of SMS Reminders and Counseling on Pregnant Women's Adherence to Consuming Iron Tablets	The intervention group was given the treatment of SMS reminders and counseling for seven days before the post-test.	170 pregnant women	The outcome indicated that, at the time of the post-test, the effects of the SMS Reminder and counseling on knowledge, attitude, and adherence of pregnant women in the intervention group were comparable to those of the control group.

Author	Title	Study Design	Study sample	Key findings
Kusumawardani N, Darmawan E, Akrom A, Retnowati S (2019)	Brief counseling by pharmacists enhances the knowledge, perceptions, and compliance of first and second-trimester pregnant women consuming ferrous fumarate at Jetis Community Health Center of Yogyakarta	It is a quasi-experimental study with a pretest-posttest control group design	26 pregnant women	The findings revealed a substantial difference in the intervention group's average scores between the pretest and posttest for knowledge, perceptions, and compliance, but an insignificant difference in the control group's average scores.
Pratama ANW, Puspasari N, Christianty FM (2019)	The Effect of Counseling on Adherence to Iron Supplementation among Pregnant Women in Lumajang Regency	Quasi experimental	62 pregnant women	The treatment group's overall adherence level differed significantly from that of the control group. It was demonstrated that counseling using brochures increased pregnant women's adherence to iron supplementation.
Vernissa V, Andrajati R, Supardi S (2017)	The Effectiveness of Leaflet and Counseling Methods on Iron Tablet Consumption Adherence and Hemoglobin Status Among Pregnant Women with Anemia in Primary Health Care in Bogor District	Quasi experimental design	158 anemic pregnant women	Pregnant women with anemia who received leaflets or counseling from a pharmacist reported much higher drug adherence, with no difference between the two groups.
Purbowati N (2017)	The Influence of Counseling Using Flip and Leaflet on Compliance Pregnant Women Consuming Tablets Iron	Quasi-experimental with pre-test and post-test control group design	66 pregnant women	After therapy, there was a substantial difference between the two groups' knowledge and attitude scores. Between the treatment group and the group control, there was a considerable variation in the adherence to taking iron supplements.

Table 3. Intervention and control types

Author	Intervention	Control/Intervention 2	Health Profession
Berhane A, Belachew T (2022)	Randomly selected women who were given preconception picture-based education and counseling along with 60 mg of elemental iron and 400 μg (0·4 mg) of folic-acid supplementation for 3 months	Randomly selected women taking 60 mg of elemental iron and 400 μg (0·4 mg) of folic-acid but not given preconception picture-based education and counseling for 3 months	Midwife and health extension workers
Nahrisah P, Somrongthong R, Viriyautsahakul N, Viwattanakulvanid P, Plianbangchang S (2020)	Individual education by midwives through the pictorial handbook	Control area received routine antenatal care without any further support such as that received by women in the intervention area.	Midwife
Heryadi PL, Sauriasari R, Andrajati R (2017)	Respondents had received a media leaflet with pharmacist counseling.	No pharmacist counseling	Pharmacist
Prihanti GS, Imawan R, Iskandar FY, Diastuti LP, Adawiyah R, Safrillia S, et al (2022)	The intervention group was given a series of treatments in SMS reminders and counseling for seven days before the post-test.	The control group got the usual care from Balowerti Community Health Center.	Doctor
Kusumawardani N, Darmawan E, Akrom A, Retnowati S (2019)	The respondents in the intervention group partook in brief counseling-5A by a pharmacist	Respondents received medication information according to the practiced procedure at Jetis Community Health Center of Yogyakarta	Pharmacist
Pratama ANW, Puspasari N, Christianty FM (2019)	The treatment group got routine health services coupled with counseling. The tools used to support counseling are brochures given to respondents after counseling	Routine antenatal care from The Community Health Center in Lumajang	Pharmacist
Vernissa V, Andrajati R, Supardi S (2017)	Pregnant women with anemia who were given pharmacist counseling at the Cileungsi Health Center Pharmacist	Pregnant women with anemia were given leaflets at the Cileungsi Health Center.	Pharmacist
Purbowati N (2017)	The treatment group that was given the intervention counseling using sheet media feedback and leaflets	The control group got the usual care from the health center working area Kedaung Wetan	Midwife

Table 4. Counseling and other media interventions

Author	Country	SMS	Interactive Media	Direct Counseling
Berhane A, Belachew T (2022)	Ethiopia		✓	✓
Nahrisah P, Somrongthong R, Viriyautsahakul N, Viwattanakulvanid P, Plianbangchang S (2020)	Indonesia		✓	✓
Heryadi PL, Sauriasari R, Andrajati R (2017)	Indonesia		✓	✓
Prihanti GS, Imawan R, Iskandar FY, Diastuti LP, Adawiyah R, Safrillia S, et al (2022)	Indonesia	✓		✓
Kusumawardani N, Darmawan E, Akrom A, Retnowati S (2019)	Indonesia			✓
Pratama ANW, Puspasari N, Christianty FM (2019)	Indonesia		✓	✓
Vernissa V, Andrajati R, Supardi S (2017)	Indonesia		✓	✓
Purbowati N (2017)	Indonesia		✓	✓

Table 5. Types of interactive media

Author	Interactive media
Berhane A, Belachew T (2022)	Pictured based nutrition education and brochure
Nahrisah P, Somrongthong R, Viriyautsahakul N, Viwattanakulvanid P, Plianbangchang S (2020)	Pictorial Handbook
Heryadi PL, Sauriasari R, Andrajati R (2017)	Leaflet
Pratama ANW, Puspasari N, Christianty FM (2019)	Brochure
Vernissa V, Andrajati R, Supardi S (2017)	Leaflet
Purbowati N (2017)	Flip sheet and leaflet

DISCUSSION

Of the eight (8) articles that have been examined, those were the ones that covered counseling strategies in boosting anemia patients' adherence to therapy. There were numerous ways to provide therapy, including one-on-one sessions, 5-A short sessions, leaflet-based sessions, and picture-based booklet sessions. To prevent failure in the treatment of folic-acid supplementation brought on by patient non-compliance in taking medication, ignorance about the condition being treated, and low understanding of the significance of taking medication, counseling is seen crucial. In the course of therapy, there was a method or procedure for building a relationship between the counselor and the client. By doing this, it was intended that the client would feel comfortable speaking openly and honestly with the counselor about

anything that was on their mind. In this manner, the counselor could identify the patient's issues that were causing the patient to behave in an unhelpful manner and assisted the patient in resolving the issue. Brief counseling was an effective method for increasing patient compliance[36]. A short-term intervention technique (brief counseling) was developed in the current state of counseling approaches. Brief counseling essentially responded to the needs of support services that value pragmatism, effectiveness, and efficiency, especially in terms of time restraints, and concentrates on certain issues to reach the counselee's intended outcome. Brief counseling implied the time-limited treatment or counseling by utilizing strengths and understanding the context of issues that arise in the present and the future, rather than being a specific strategy or a unique/different model from other theories and practices.

Journal analysis has revealed that midwives and pharmacists predominated among counselors in several research journals for the intervention. The advice given by pharmacists had some benefits, including definite safety and effectiveness, the ability to assist in the resolution of therapeutic issues in specific circumstances, the reduction of medication errors, the avoidance of unintended side effects, and an increase in adherence to research therapy or treatment[37]. According to research results, pharmacist counseling had a significant effect on increasing compliance with patients and increasing patient comprehension about a disease and its knowledge[38]. Patient compliance with treatment ultimately will improve therapeutic outcomes. Knowledge significantly influencing the compliance of pregnant women consuming iron tablets was necessary to increase the education of pregnant women regarding anemia iron deficiency during pregnancy[39.] Health workers, especially midwives, according to service standards midwifery, should do antenatal care service standards, namely standard 6 to be able to do management of anemia during pregnancy. Midwife took precautions, discovery, treatment, and/or referral of all cases of anemia to comply with applicable provisions. Midwives were expected to able to recognize and manage anemia in pregnancy, as well as give counseling and nutritional counseling to prevent anemia.

Only few studies showed an association between counseling interventions and the achievement of therapeutic outcomes; however, counseling interventions were related to greater patient adherence to their medications. The study's results appear to be influenced by differences in the intervention's style and design, control group, choice of primary and secondary objectives, and instruments for measuring adherence. The majority of research looked at clinical outcomes as secondary results after evaluating medication adherence as a primary outcome. It was difficult to determine the relationship between adherence and clinical results since some studies did not measure clinical outcomes. The study's findings underpinned that interventions executed with multiple additional components—including a range of media—were more likely to provide favorable intervention outcomes. The benefit of this research was that it helped health professionals (doctors, nurses, pharmacists, and midwives) increase medication adherence by pinpointing the most effective counseling interventions. The abundance of counseling services available was the study's flaw. In addition, other interventions were found in the journals that were examined, raising the possibility that interventions other than counseling could have an impact on treatment adherence and success. Despite these drawbacks, counseling was seen as

beneficial for anemia patients as shown by the rise in drug compliance following the delivery of counseling interventions.

CONCLUSION

Health professionals' face-to-face therapy, including conventional and brief counseling, was found to be extensively employed; nevertheless, the multifaceted therapies were also successful in enhancing the overall outcome measures. These interventions might be more effective due to the careful planning of tailored interventions with more regular follow-ups, various forms of interactive educational media, and patient characteristics.

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DECLARATION OF INTEREST STATEMENT

The authors state that there are no interests at odds with one another.

AVAILABILITY OF MATERIALS

The corresponding author will provide the data used or analyzed during the current study upon reasonable request.

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